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Electric Railway Journal

Volume 69

January to Jnne, 1927

McGraw-Hill Publishing Company, Inc.
Tenth Avenue at Thirty-sixth Street
New York City

Getting the Most from the Index

This is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located, but in the case of electrified sections of steam railroads, the entries appear under the name of the railroad.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below is a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into fourteen general subjects.

The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index. The list of keywords is revised from time to time to keep the index abreast with developments.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings, papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short articles about machine tools appear only under the heading "Repair shop practice; shop methods and equipment" and are not indexed alphabetically, because there is a wide choice in most cases of the proper keyword to be used.

Signed articles also are indexed by the name of the author. When the name of the author is known to the reader this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION

Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS

Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT

Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES

Education
Employees
Insurance and pensions
Labor
Strikes and arbitrations
Wage decreases
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Wages and working agreements

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Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS

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Appraisal of railway property
Blanks and forms
Discontinuance of lines
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Financial reports
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

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Locomotives

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Lubrication
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Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
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Motor buses, field for
Motor buses, installations
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Motor buses, operating practice
Motor buses, regulation

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Power generation
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Terminals and waiting stations

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Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION

Advertising
Customer ownership
Dispatching
Freight and express
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Merchandising transportation
Parking of cars
Publicity
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Rapid transit (elevated and subway)
Schedules and timetables
Signals
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Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan (general studies)

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Management
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Railways (general)
Snow and ice removal
Standardization
Wood preservation

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, January 1, 1927 *Number* 1

The New Year Is Bright with Opportunity

RECORDS of passengers carried, miles of track constructed and reconstructed, cars purchased, buses operated, receiverships lifted and other measuring sticks of the industry's progress all show a successful year during 1926. There is no need here to quote the figures. They are given in detail in the articles printed in this issue. It is in the underlying conditions which have produced the favorable results of 1926 and the tendencies which indicate the prospects for the future that primary interest lies.

Reviewing the developments of the past year, a number of high spots stand out. The electric railway industry has begun to interpret into concrete railway policies the abstract discussion of changed conditions which it is called upon to meet. "Transportation merchandising" has been translated from words into action. "Favorable public relations" has come to be recognized as springing primarily from improvement of the character as well as the adequacy of the service rendered. The attitude of employees toward the company's customers has been found to be a reflection in a large measure of the attitude of the management toward the employees and the attention given to their proper training for the job. All of these things may be grouped as the human or psychological factors affecting the industry's performance. The record would not be complete without pointing out that there has been a continuing tendency for the few faint-hearted and precedent-bound executives who lacked faith in their own business to give way to those with greater vision, courage and enthusiasm.

MODERNIZATION has taken on a more definite meaning. There has developed a widespread conviction that an industry which presents a down at the heels appearance may expect to be treated as a failure and that the public has no interest in its difficulties and problems, unless that interest is won by making the service so attractive as to arouse public enthusiasm. There has been a growing realization that, though a franchise may grant a theoretical monopoly, common-carrier transportation is actually in competition with individually owned vehicles to such an extent as to require the application of all the principles and methods used in any other competitive business. Realization of this has developed a rapidly growing interest in the replacement of obsolete equipment and the rebuilding of rough and poorly aligned track. This has been accompanied by a persistent demand for car improvements and developments designed to make the rail-borne vehicle quieter, more attractive and more economical. Here there is still a wide open opportunity for the exercise of ingenuity by manufacturers.

WHILE there is general agreement among transportation men on the need for co-ordination of transportation service, progress in the application of this principle on a broad basis has been slow. The process of fitting together the bus and the car has been confused to an extent by the tendency to compare the performance of new and modern automotive vehicles with poorly maintained cars that have seen many years of service.

In special party, sightseeing and touring service an attractive field for new bus business has opened up on a basis which offers attractive profit. In the field of scheduled service approximating in comfort and speed the private automobile, and at rates considerably above those charged for mass transportation service, there seem to be almost untouched prospects for profitable application of buses on a large scale.

THERE is progress toward broader thinking on the local transportation problem in large cities. In that transportation men have in the past overlooked the relation between the destiny of any one company and the entire transportation situation in a community, they have not played as active a part in helping to point the way toward sound community policies as they may be expected to do in the future.

All signs point toward continued progress and improvement. The industry's future depends on the imagination, courage and public spirit displayed by those charged with the responsibility of directing the destinies of the various properties. Based on the added experience of 1926, the new year opens bright with promise and opportunity.

National Prosperity Is Reflected in Results of Electric Railway Operations

PROSPERITY for the country at large is linked closely with prosperity in the electric railway industry. Transportation of the working population plays the largest part in the railway gross revenues. Hence the continuation of a high rate of production in the various industrial communities, with corresponding large payrolls, has had a direct effect in swelling the revenues of the transportation companies.

It is too early yet to tell the exact status of operations in 1926, or to make a final comparison with the year previous. Replies to inquiries by this paper received from a number of executives of electric railway properties, large and small, over a wide territorial range are almost unanimous in stating that the results of the past year will equal if not slightly exceed those for 1925. The earlier year was a very good one as regards traffic and revenue. It is quite possible that 1926 will go down in history as the greatest traffic year the industry has known up to this time.

As to 1927, opinion seems to be that conditions which have obtained for the past year will be continued. Many railway operators are planning for increased traffic. Economies are also becoming effective, so that the spread between income and outgo is becoming greater. In this way prosperity in the transportation industry is showing a steady growth.

While a large share of the new business recorded for the past year has come as a result of the general business prosperity, other contributing factors are extensions of service, both by street cars and by buses. But not an inconsiderable portion of the increase in business has been the direct result of salesmanship. Those roads which have given the greatest attention to the provision of better facilities and have made the public conscious of the fact are the ones which have gone ahead most rapidly. Individual expressions show that some managements are keeping in mind all the possibilities for selling service to the public. It is only in so far as the managements have adopted this attitude that the railways have obtained the full measure of success that is possible in this day of almost universal prosperity.

Renewed Activity in Track Construction Reflects Improved Condition of Industry

FOR the third successive year additions to the electrified trackage of the country exceeded by a substantial margin the mileage abandoned. Extensions to city and interurban lines approximated in amount the same as in 1925. Steam railroad mileage electrified during the year was somewhat less than the year before. Abandonments, however, showed a slight decrease. As a result, there was a definite net gain in the total miles of electrically operated track. Coupled with this was a large increase in the amount of track rebuilt. Altogether the mileage of new construction and reconstruction totaled about 12 per cent more than that of the preceding year. This quickened activity in trackwork furnishes encouraging evidence of the sound condition of the electric railway industry.

There was a substantial increase not only in the amount of trackwork done but there was also a corresponding gain in the number of companies reporting track improvements. Particularly significant was the activity of the interurban companies. More new interurban track was built in 1926 than was built the year before and the mileage of reconstructions was more than twice as great. City track reconstruction in 1926 exceeded that done in 1925 by about 100 miles, though city extensions lagged somewhat behind.

Figures for steam railroad electrification scarcely do justice to the situation actually existing. While the mileage of track on which electric operation replaced steam operation during the year was considerably less than in 1925, the number of new electrification projects undertaken was impressive. Included among these are the plans of the Pennsylvania and Great Northern Railroads, totaling several hundred track-miles.

From statistics covering the development of the electric railway industry over a period of many years, it appears that the total of electrified mileage in this country and Canada reached a maximum of about 46,000 in 1920. In that and the following three years the mileage of abandonments exceeded that of additions made, a net loss of some 500 miles of track occurring during this period. In 1924 the losses and gains practically balanced each other. Since that time there has been a distinct upward trend, amounting to about 250 miles net gain, so that today the total electrified mileage remains only slightly below the maximum figure.

Budget Forecast Indicates Constancy of Industry's Purchasing Power

NOTWITHSTANDING 1926 purchases dropped behind those of recent years, the forecast for 1927 promises an increase of nearly $31,000,000 over the year just closed. This estimate and forecast, presented elsewhere in this issue, is based on an extended survey of railway companies that ELECTRIC RAILWAY JOURNAL conducts each year. Questionnaires were sent this year to a much larger list, including properties of all sizes, so that the figures now presented represent returns received from fully 50 per cent of the electric railway mileage in the United States and Canada.

Estimates of new expenditures, principally for betterments, indicate the urge to improve the service. Approximately $55,000,000 is the budget for cars alone, an increase of $15,000,000 over that spent in 1926. Most of this is for new cars and the balance for the modernization of old equipment. Whether or not this healthy increase materializes and whether it will continue in a satisfactory manner in future years depends in no small measure on the ability of the manufacturers of cars to develop equipment sufficiently far advanced to offer a revenue building appeal that will be attractive to the operators.

Some comment may be caused by the slight decrease of bus purchases. It should be borne in mind, however, that the use of this vehicle by railways has had a rapid growth in recent years and it is only natural to expect that the use of the bus will settle down to a normal basis commensurate with its economic usefulness. There seems little reason to doubt that bus purchases will continue to show a general tendency upward, due to an increasing use as well as to replacement. This latter factor will, of course, not make itself evident for several years, as few of the buses recently placed in operation by railways are yet due for retirement.

That the industry has continued to purchase well over $100,000,000 of new track, equipment and power facilities and that this year it plans to spend $145,000,000 are interesting in the light of its poor credit standing. Much of the money has undoubtedly been acquired through channels of joint utility company financing, but no small part has been drawn from transportation earnings. This latter process is only another indication of the inherent strength of the industry.

The railways are making a noteworthy struggle, harassed as they are on one hand by an impaired credit and political bickerings, though encouraged on the other by a growing appreciation of the basic necessity of local transportation. A constancy of expenditures in the light of these facts, all too well known, cannot be taken otherwise than as an encouraging sign.

Financial Factors of 1926 Were Favorable

COMPARISONS often are odious. It is an old statement. Still the desire is irresistible, particularly at this time of the year, to indulge in just this kind of thing. On its face the amount of new financing by the railways seems infinitesimal compared with that done in other industries, but the total of such financing so reported does not tell the whole story, else the expenditure of $233,000,000 by the electric railways in 1926 for maintenance, materials and supplies, including new cars, would be inexplicable. But it isn't. The industry is spending not lavishly, perhaps, but it is spending. Much of this money is coming out of earnings, a tendency that seems automatically to strengthen the financial structures of the companies that resort to this means. One company that comes to mind deliberately withheld dividends from its stockholders for a period of several years rather than to borrow at the prevailing rates, and later capitalized these expenditures and returned the company to a dividend-paying basis after the physical improvements thought to be necessary had been made. These improvements have certainly paid their way.

So it is with the matter of the purchase of new cars. New cars are being bought, not perhaps to the degree that the increased earning power of such equipment would seem to justify, particularly when it has been so firmly established that modern cars will save enough in operation to pay not only their carrying charges, but leave a substantial balance for the amortization of superseded equipment. But new cars are being bought. So are buses. Many of the utility properties include railway, light and even gas in a combination that makes it quite impossible to segregate the amounts of money applied to each of these activities. The JOURNAL account does not contemplate any attempt to summarize the utility total, but the amount of securities placed publicly in 1926 on combined properties reported by *Electrical World* is $1,149,000,000.

Of the financial condition of the railways as a whole there are many signs that are hopeful. If the reader will turn to the diagram of receiverships elsewhere in this issue and follow the black line, he will see at once that the peak of receiverships as regards mileage was reached in 1919, with the 1926 amount lower than in 1925. The improvement has, in short, been progressive. This is likewise true of the record of receivers' sales. The record of receivership for 1926 was unusually propitious. True, the Chicago Railways found it expedient to seek the protection of the courts, but there has never been any question about the earning capacity of the road. Gradually but surely the amount of securities in default is being decreased. That is significant.

Increasing Use of the Bus Shows Satisfaction with Past Performance

MORE and more each year the bus is finding its logical place in the local transportation system. Progress in the development of bus operation by electric railways continued during 1926 at approximately the same rate as during the record-breaking year 1925. The number of buses operated by these companies increased from 5,358 on the first of January a year ago to 7,749 at the present time, a gain of more than 40 per cent. During this period the number of electric railways engaged in bus operation increased from 280 to 333, a gain of approximately 20 per cent.

To a noteworthy extent the development has taken the form of expansion of activities by railways that were operating buses a year ago. This is shown clearly by the fact that the increase in the number of vehicles has been proportionately much greater than the increase in the number of companies operating them. So it would appear that experience has proved the bus to be a valuable addition to the equipment of the electric railways.

Bus route extensions made by the railways during the year just ended were impressive in amount, totaling approximately 2,650 miles, exclusive of sightseeing service. This figure is considerably in excess of that for the record-breaking year 1925. By far the greater part of the new route mileage represents the establishment of additional facilities where none formerly existed. Rail service was superseded by bus service on only some 215 miles of track. From this it appears that the bus is finding its own place in the transportation field. To a slight extent it has replaced the car where it was found to be a more economical vehicle. To a far greater extent, however, it is being used to provide an entirely new service.

Sound Transportation Policies Cannot Be Built on Expediency

NEW YORK and Chicago are the high spots in the country-wide struggle for city transportation readjustment. Their very size and complexity merely magnify the problem encountered on a smaller scale in several other cities. So far, there has been little progress in either city toward a workable plan for providing an adequate transportation system that may grow and expand with the increasing needs of the community. In the meantime, jockeying for position on the part of the several interested parties has resulted in a number of moves which, though they have attracted much attention, are not in the direction of establishing broad principles of transportation settlement. In both cities the difficulty of arriving at a fundamental solution is increased, and the baffling tangle of interests is made even more complicated by injection of the bus into the already complex situation.

In Chicago a boulevard bus system was permitted to grow up during a period when the other transportation companies failed to recognize seriously the possibilities of this new vehicle. In New York the bus system, at one time a part of the existing transportation properties, was permitted to get into other hands. In both cities the present bus line owners are now alert to protect and promote their own interests in any general transportation program. Few would question their right to discharge this responsibility to their stockholders.

Both in Chicago and New York the situation is complicated by opposing corporate interests, personalities and politics. Since a company with its money invested in operating bus lines is obviously concerned in any city-wide plan, there is occasion for little surprise at moves which are made with the intention of strengthening the bus position in general transportation negotiation. But in the heat of the struggle brought about by the necessities and exigencies of such situations there is danger of creating popular misunderstanding which is unfair to existing transportation units, and dangerous to the entire local transportation industry.

That there is a proper and economic place for rapid transit, surface cars, buses operating as street cars on rubber tires, and buses furnishing a preferred form of service at distinctly higher rates of fare has gradually become the accepted conception of a comprehensive co-ordinated transportation service. Expedient though it may be at the moment, because one particular form of transportation is relatively free of legal restrictions and tax burdens carried by other agencies, it is obviously not in the best interests of the public or the community to abandon the principle that each vehicle should be used in the character of service for which it is best fitted. The full co-operation of all transportation men is needed in advocating and pressing the principles of city-wide co-ordination, flexible franchises and fares, and relief from unfair direct and indirect tax burdens. Whenever a concession is made from this sound industry policy in an attempt to secure an advantage for a particular property, establishment of transportation on a secure business basis receives a setback.

The effort to maneuver into a stronger position led to the purchase of the New York Railways Company by the Fifth Avenue Coach Company. Since this is to be followed by rehabilitation of the major rail lines and substitution of buses only where they are found to be more suitable, the consolidation seems a move in the right direction. But in Chicago, where the situation, though equally complicated, is set up in a slightly different way, the same people recently proposed to substitute buses for all of the cars on what is probably the finest street railway system in the world. As a move in the interest of the existing bus investment this, of course, may be a well-timed stroke to assure adequate consideration of the bus in any proposed general solution. But looking at the proposal from the standpoint of the community's interest and the industry's future it offers at best a mere expedient to circumvent the present need for franchise legislation in Illinois.

The local transportation industry is suffering today from the adoption in the past of just such short-sighted expedients, which though they accomplished the immediate object of their proponents have left the industry and its ultimate security holders buried in a mass of public ill will and self-created operating shackles. Distortion of the transportation picture in the eyes of the public for the immediate profit of a given interested group is not in the best interest of the public itself or the transportation industry as a whole.

There is no question but that the bus will ultimately play an important part in the establishment of a unified and co-ordinated transportation system both in New York and Chicago—and in every other large city as well. But every effort to extend the use of any particular agency beyond the field in which it can give the most economical and efficient service on a basis comparable with other existing agencies leads to confusion of thought and waste of the ultimate rider's money. In the fact that a proposal to substitute buses for all the street railway lines in a city like Chicago presupposes that buses in mass transportation service may remain immune to the burdens carried by other agencies it is short-sighted thinking. In the fact that it creates the impression that buses can be successfully operated as mass transportation vehicles at the present level of street car rates it is dangerous to the future of the bus itself. In that it is based on the contention that a 100-passenger vehicle free to weave about on a pavement creates less congestion than one confined to rails it sows the seed for future difficulty and public ill will. Such a proposal handicaps the formation of a properly-balanced and co-ordinated transportation system—one which may be operated on a basis to provide adequate transportation to the public and a reasonable return to the investor, in the future as well as the present.

Steady Progress Reflected by Car Purchase Statistics

PASSENGER car purchases during 1926 showed an increase of 184 over 1925. This was due entirely to cars bought for city service, as the number of interurban passenger cars was 11 less than for 1925. The gain in purchases of city passenger cars amounted to 195, divided 157 for rapid transit service and 38 for surface transportation. Although the number of interurban passenger cars bought in 1926 was slightly less than that for 1925, still the total number of interurban cars purchased was 33 greater, due to the number of freight cars bought.

A number of points are outstanding from the statistics of car purchases during 1926: The total of cars and electric locomotives was 13½ per cent greater than for the preceding year, although less than half the number for either 1923 or 1924. The number of city surface passenger cars bought is approximately the same as for 1925, while the number of rapid transit motor cars is about double. Interurban passenger cars total nearly the same as in the previous year, while the freight cars are 28 per cent more. Electric locomotives exceeded by 28 per cent the orders for 1925, the number bought being the greatest since 1923.

Cars built for operation by one man or two men are the most popular for city service, as they were the year before, the number of this type being nearly 45 per cent of the total passenger cars. Orders for multiple-body articulated cars were placed by three companies, with a total of 89 units.

Light-weight construction is an essential feature of all the new car designs, and greater attention than ever before has been given to the improvement of appearance and to the provisions for greater comfort and convenience of passengers. With respect to power, four-motor equipments were supplied for the majority of the double-truck cars.

An interesting feature is that the number of cars junked during the year is almost as great as the number purchased, showing the attention that has been given to the replacement of obsolete equipment with modern.

Continued Progress Indicated for 1927

Industry Shows Increased Riding in 1926 Over 1925 Despite a Readjustment in Operating Conditions—Electric Railway Executives in All Sections of the Country Predict Further Development During the Coming Year

FROM all sections of the country comes evidence that there was an improvement in electric railway business last year over 1925. While there are individual instances where there was a recession, they are comparatively few. In general, the revenues of electric railways and their allied bus systems have followed the improvement in business that has been nationwide.

The increase in gross business has resulted from a growth in the number of revenue passengers that has been going on for many months, following the recession of 1924 and 1925. Revenue passengers on cars and buses of 217 companies reporting to the American Electric Railway Association covering the period of the first eleven months of 1926 were 8,787,657,991 as compared with 8,682,740,211 in the corresponding period of 1925. This is an increase of 1.21 per cent. These figures represent somewhat more than one-half of the industry. On this basis the total riding for the twelve months will approach closely, if it does not exceed, the riding for 1923, which was the previous banner year of the electric railway business.

> YESTERDAY'S problems are waters over the dam. Today's problems are what we are confronted with, and every he-man in the industry, from the humblest employee to the chief executive, must give the best there is in him, not only to hold the ground we have gained for our patrons and our investors but to accomplish even better results in 1927.
>
> Enthusiasm, up and down the line, is what we need more than anything else. Let's have it! Apathy, now that the street railway industry has turned the corner and is again on the high road to prosperity, is unthinkable. Railroading in these days is an entirely different proposition than it was a few years ago. None of us can afford to stand idly by and watch the parade. We must be in it and right up in the front ranks.—*R. B. Stearns.*

Along with this increase in passenger traffic the fares charged over the country have held up. In fact, there has been a slight but continuous increase in the fare index throughout the year from 151.2 to 153.2, or 1.33 per cent. Thus it would appear that the revenues have been greater than those of 1925 by about 1.6 per cent. The exact figure is subject to minor revision, when final figures for the year become available.

Fluctuations in operating expenses have been somewhat greater than those of passengers and revenues. Some companies have introduced economies that have permitted them to earn an increased net, while others, particularly those faced with wage advances, have not been able to make so good a showing. For the industry as a whole it is unlikely that there has been any material change in the net income from that obtained in 1925.

Good Business Predicted for 1927

As regards the future, continued growth in riding and in revenue is forecast by the prospect of continued business prosperity through the coming year. Railway men are in general optimistic about the situation. In this they are in agreement with such industrial leaders as Elbert H. Gary, chairman of the United States Steel Corporation; Charles E. Mitchell, president of the National City Bank of New York; W. C. Teagle, president of the Standard Oil Company of New Jersey; Charles M. Schwab, chairman of the board of directors, Bethlehem Steel Corporation; Alfred P. Sloan, Jr., president of the General Motors Corporation, and many others who are nationally prominent. These men are almost unanimous in predicting that industrially the coming year will be the greatest the country has ever known. While 1926 was a year of comparative stability there was a gradual expansion of business activity, so that the beginning of 1927 finds the country at the peak of prosperity.

Electric railway men all over the country are of the opinion that the new year, while not in any great respect different from the one just closed, will show greater business and increased revenue over 1926. There will be places where the general prosperity will not extend, of course; but in that respect last year was not in any marked degree different. It is in the larger industrial centers that there is and will be the greatest measure of prosperity. In these centers the activity has reached greater heights, and in them the use of individual modes of transportation, such as the private automobile, is more difficult, so that the need for common carriers is the greater. In the small cities the automobile has made serious inroads, so that there has not been a growth in riding on street cars and buses comparable with the population and its activities. Conditions in medium-sized cities are somewhat varied, depending to a considerable extent on the local political situation and the ability of the individual managements to apply business principles to the conduct of their systems.

In order to get definite information relative to the actual conditions existing throughout the industry, Electric Railway Journal has requested a number of prominent electric railway executives to give their estimates of business done by their companies in 1926 as compared with previous years, and their estimates of what the coming year may be expected to develop. These properties represent large and small systems, both urban and interurban. Some of them operate buses in conjunction with the rails, while others do not. All sections of the United States and Canada are included. With few exceptions the replies indicate that this year is likely to exceed last year by a satisfactory margin.

Even in New England, which has had many industrial difficulties during the year, the street railway business has not suffered. Both of the leading street railway systems in Massachusetts have had increased gross business. Edward Dana, general manager Boston Elevated Railway, reports a gain, both in riders and in revenue. He says:

> THE approximate results of operations of the Penn-Ohio Transportation System, both railway and bus lines, for the year 1926 will show a distinct improvement over similar operations for the year 1925. The combined passenger revenue on railway and bus lines will show an increase of about $125,000, or more than 3½ per cent, while the operating expense will show a reduction of about $10,000, or about 0.3 per cent. Together these will increase the net earnings approximately $135,000, or more than 18 per cent.
>
> The decrease in operating expense has been accomplished with a slight decrease in car mileage but an increase of 250,000 bus-miles, or more than 10 per cent. The operating expenses of the railway lines show savings amounting to about $138,000, due to a great extent to the modern light-weight noiseless cars with which all our lines are now completely equipped.—*R. P. Stevens.*

Our gross income will be approximately $800,000 more in 1926 than in 1925. The total revenue passengers will be approximately 5,000,000 more than in 1925.

Our trustees' fiscal year ends June 30, to which end our operation is directed. The calendar year 1926 will show the cost of service several hundred thousand dollars in excess of receipts, to be overcome before June 30, 1927. There was a slight surplus on June 30, 1926, and we expect to do equally well next June. There is no indication at the present time of other than continued normal conditions.

On the Eastern Massachusetts Street Railway, which operates in a number of the mill towns, such as Lowell, Lawrence and Lynn, conditions have been somewhat less favorable. However, the situation is hopeful, as is indicated by the following statement from R. B. Stearns, vice-president and general manager:

The following is an operating statement of Eastern Massachusetts Street Railway from 1920 to 1926 (eleven months) inclusive:

	Gross Revenue	Operating Net After Taxes	Interest and Rentals	Surplus for Stock
1926 (11 mo.)	$8,605,873	$1,773,972	$1,141,683	$632,290
1925	9,333,250	2,030,143	1,291,820	738,323
1924	9,745,501	2,164,057	1,362,658	801,399
1923	10,712,706	2,276,687	1,398,152	878,535
1922	10,712,663	2,557,749	1,497,956	1,059,792
1921	11,318,264	2,515,410	1,623,021	892,389
1920	13,195,275	927,609	1,588,145	660,535

With the close of the year 1926 another year of business success for the street railway industry has passed into history. No year since the period prior to the World War has been on the whole so satisfactory to this industry as 1926. Evidence has accumulated month after month that the public has at last come to the definite conclusion that electrically propelled street cars are absolutely essential to the welfare of every live community.

We men who are directing the affairs of the street railways appreciate this and intend to strain every nerve during 1927 to show the car riders that we are deserving of their continued confidence. Yesterday's problems are waters over the dam. Today's problems are what we are confronted with, and every he-man in the industry, from the humblest employee to the chief executive, must give the best there is in him, not only to hold the ground we have gained for our patrons and our investors but to accomplish even better results in 1927.

Enthusiasm, up and down the line, is what we need more than anything else. Let's have it! Apathy, now that the street railway industry has turned the corner and is again on the high road to prosperity, is unthinkable. Railroading in these days is an entirely different proposition than it was a few years ago. None of us can afford to stand idly by and watch the parade. We must be in it and right up in the front ranks.

Pittsburgh is the center of an industrial district which has had a different condition during the year from that of New England. Business has been good in the iron and steel industry, and this condition has been reflected in the street railway. It is noteworthy that with the greater traffic handled and larger number of car-miles operated, there has been a reduction in operating expenses. It is expected that this year's business will be even better, as is indicated by this statement of Vice-President Thomas Fitzgerald of the Pittsburgh Railways:

The following is a tabulation of operating statistics of the Pittsburgh Railways for the years 1924, 1925 and 1926, with an estimate for 1927:

	1927 (Estimated)	1926	1925	1924
All passengers carried, including estimated pass rides	410,000,000	400,000,000*	370,412,204	326,673,344
Car-miles operated	41,900,000	41,280,000*	39,688,609	39,593,051
Revenue from street railway operations	$21,870,700	$21,720,000*	$21,813,696	$22,063,777
Operating expenses plus taxes	$17,410,916	$17,233,000*	$17,461,177	$18,028,919

* Eleven months actual, December estimated.

The above estimate for 1927 is based on a continuation of the present industrial and commercial activity in Pittsburgh, which it is believed can reasonably be expected.

CONDITIONS IN CENTRAL TERRITORY

The manner in which the Coffin Prize winner for 1926 has been able to take advantage of good business conditions in the Youngstown district is indicated by the following statement of R. P. Stevens, president Republic Railway & Light Company, the holding organization which controls the Pennsylvania-Ohio lines:

The approximate results of operations of the Penn-Ohio Transportation System, both railway and bus lines, for the year 1926 will show a distinct improvement over similar operations for the year 1925. The combined

> passenger revenue on railway and bus lines will show an increase of about $125,000, or more than 3½ per cent, while the operating expense will show a reduction of about $10,000, or about 0.3 per cent. Together these will increase the net earnings approximately $135,000, or more than 18 per cent.
>
> The decrease in operating expense has been accomplished with a slight decrease in car mileage but an increase of 250,000 bus-miles, or more than 10 per cent. The operating expenses of the railway lines show savings amounting to about $138,000, due to a great extent to the modern lightweight noiseless cars with which all our lines are now completely equipped.
>
> From present indications the improvement shown this year should continue throughout 1927. Of course, it is impossible to say now whether the present slackening of business activity is merely a lull before another resumption of our forward progress or suggests a slower pace for the time being. As there is nothing apparent to menace our business situation and all the principal activities in the territory served by the Penn-Ohio system are in a flourishing condition, we have no reason to believe there will be any general let-up of business in the territory we serve, the present easing off being more than offset by results from economies which we are constantly putting into effect.

Considerable interest attaches to the results in Cincinnati, as the system in that city was reorganized only a little more than a year ago. Progress has been made in attracting customers to the cars and buses, as is indicated by this statement by Walter A. Draper, president Cincinnati Street Railway:

> The Cincinnati Street Railway, which formerly leased its property to another operating company, resumed operation on Nov. 1, 1925. Consequently it is just completing the first full year of operations. Comparison of revenues with the preceding year would be confusing, due to reduction in rates of fare. The year, however, has shown gratifying increase in riding on street cars, while the operation of motor coaches, begun last spring, has apparently developed a new field without reducing car riding. Operating expenses have increased due to extensive track reconstruction. The new year promises a continued trend toward increase in street car riding and away from automobiles and independent motor coach operations. Indicated improvement in general business conditions, which will be helped by several large undertakings going forward in Cincinnati, also will be reflected in more use of cars and coaches.

Another Ohio city in which important developments have taken place during the year is Cleveland. With the negotiation of a new franchise, and an increase in the rate of fare, the results have not only been good, but the outlook for 1927 is even better. Paul E. Wilson, vice-president and secretary of the Cleveland Railway, summarizes the situation as follows:

> The operations of the Cleveland Railway in 1926, on the whole, were satisfactory. While the volume of traffic was less than we could have wished for and have handled, it approximates the volume of the preceding year, which had one more day. In six months of the year we showed an increase in the number of revenue riders and in eight months of the year an increase in the total number of riders. Indeed, the first half of 1926 gave every promise of bettered conditions, and the decrease during the last half, in addition to being spotty, may be due in part to the fact that on Oct. 15 the rate of fare was advanced. Our situation was further complicated by the fact that a new franchise was granted us and became effective on July 1. The year 1926 was also our first full year of operation of motor coaches. To this operation supplementing our existing rail service we credit the fact that the total number of riders on the system was greater this year than last. Our passenger earnings were also greater, due largely to the change in the rate of fare, but in a considerable part to our coach operations. Our expenses likewise were greater, due to a general wage increase effective on May 1. We face 1927 with confidence, believing that relief from traffic congestion is here and that with more rapid running time and regularity of schedules, both of cars and coaches, we shall be favored with a constantly increasing patronage.

Conditions in Indianapolis are somewhat less favorable than in the cities already cited. Private automobiles have made inroads, as have competing buses. The loss in revenue due to these causes has been of minor effect, however, as compared with the increased operating expenses. The Terre Haute, Indianapolis & Eastern Traction Company, the street railway lines operated by the same management, has had an increase in revenue for the year. Expenses, however, have increased more than in proportion, so that the net has gone down slightly. More complete information is included in the following statement by Robert I. Todd, president of the two companies:

> THE Cincinnati Street Railway has shown gratifying increase in riding on street cars, while the operation of motor coaches, begun last spring, has apparently developed a new field without reducing car riding. Operating expenses have increased due to extensive track reconstruction. The new year promises a continued trend toward increase in street car riding and away from automobiles and independent motor coach operations. Indicated improvement in general business conditions, which will be helped by several large undertakings going forward in Cincinnati, also will be reflected in more use of cars and coaches.—*W. A. Draper.*

> Below are comparative statements of earnings and operating expenses of the Terre Haute, Indianapolis & Eastern Traction Company and Indianapolis Street Railway for the years 1925-1926.

Indianapolis Street Railway

	1925	1926
Gross earnings	$5,536,370	$5,499,908
Operating expenses	4,032,821	4,344,927
Net earnings	$1,503,549	$1,154,981
Taxes	386,624	295,538
Net earnings less taxes	$1,116,924	$859,443
Fixed charges	629,183	629,058
Net income	$487,742	$230,385
Sinking funds	146,567	153,150
Dividends accrued not paid	300,000	300,000
Balance—deficit	....	$222,765
Balance—surplus	$41,175	....

Terre Haute, Indianapolis & Eastern Traction Company Income Account, 1925 and 1926

	1925	1926
Gross from operating	$5,491,091	$5,674,986
Non-operating income	54,762	53,167
Total	$5,545,853	$5,728,153
Operating expenses and taxes	4,487,672	4,682,797
Gross income	$1,058,181	$1,045,356
Fixed charges	890,448	896,327
Net income	$167,733	$149,029
Sinking fund	227,513	232,393
Deficit	$59,780	$83,364

Note—November and December, 1926, estimated.

The results of operation of the T.H.,I.&E. for the years 1925 and 1926 have been about the same. There is, as you are aware, a proposed merger of the T.H.,I.&E. Traction Company and its subsidiaries with the Indiana Electric Corporation, Central Indiana Power Company and its subsidiaries, which is still being worked out. Until this is completed it will be difficult to estimate the earnings for 1927.

The Indianapolis Street Railway gross earnings for 1926 show a decrease over 1925. This is principally due to the constantly increasing use of privately owned automobiles and independent bus competition. The increase in operating expenses is due largely to the company's being obliged to run a large number of feeder buses, which are operated at a loss. The Indianapolis Street Railway has begun the construction of five new substations in the city of Indianapolis, which will be completed in a few months. It is expected that these will result in a substantial saving in the cost of power.

> THE operations of the Cleveland Railway in 1926, on the whole, were satisfactory. The year 1926 was also our first full year of operation of motor coaches. To this operation supplementing our existing rail service we credit the fact that the total number of riders on the system was greater this year than last. Our passenger earnings were also greater, due largely to the change in the rate of fare, but in a considerable part to our coach operations. Our expenses likewise were greater, due to a general wage increase effective on May 1. We face 1927 with confidence, believing that relief from traffic congestion is here and that with more rapid running time and regularity of schedules, both of cars and coaches, we shall be favored with a constantly increasing patronage.—*Paul E. Wilson.*

Another interurban railway operating out of Indianapolis is the Interstate Public Service Company, which runs to Louisville. Favorable results, both for last year and for 1927, are indicated in the following statement by Harry Reid, its president:

The approximate results of our operations for the year 1926, with December estimated, show an increase in passengers carried of 1.6 per cent over the year 1925. The total income shows an increase of 4 per cent. There is a decrease in expenses of 3.8 per cent. The net income for the year 1926 is 93.2 per cent more than for the year 1925.

The prospects for the year 1927 indicate that we should do as much business as we have done this year and with further economies in operation our net showing should be better.

The above figures do not include bus operation.

Still another combination of city and interurban companies is seen at East St. Louis, Ill. Automobile competition has resulted in a decrease in business. It has not been possible to reduce expenses in line with the revenues, so that the showing has not been so favorable as in the case of some of the other properties. The figures for 1925 and 1926, with an estimate for 1927, were furnished by F. L. Reardon, assistant treasurer East St. Louis & Suburban Railway:

We give below the actual and estimated figures for the East St. Louis Railway and the East St. Louis & Suburban Railway:

	1925	1926	1927
East St. Louis Railway:			
Revenue passengers	13,082,576	12,000,000	11,500,000
Operating revenues	$1,094,843	$1,035,000	$1,000,000
Operating expenses	$792,601	$844,000	$850,000
East St. Louis & Suburban Railway:			
Revenue passengers	6,140,000	5,950,000	5,650,000
Operating revenues	$977,432	$1,042,000	$1,000,000
Operating expenses	$883,461	$1,084,000	$1,000,000

RESULTS FAVORABLE IN WISCONSIN

Two electric railways in Wisconsin have furnished statements, and both of them are favorable. In Milwaukee there has been a gain in revenue the past year, although expenses have kept the net revenue down to the same amount as in 1925. It is, however, estimated that there will be an increase for 1927, according to the following statement by S. B. Way, president the Milwaukee Electric Railway & Light Company.

	Twelve Months Ended Nov. 30	
	1926	1925
Operating revenue	$10,924,928	$10,586,527
Operating expenses, taxes and depreciation	9,444,766	9,105,922
Net operating revenues	$1,480,162	$1,480,604
Revenue passengers carried	154,685,591	150,500,871
Revenue car-miles	28,032,709	26,563,145
Gross capital expenditures	$2,647,932	$1,904,551
Property retirements	811,167	889,484
Net increase in capital	$1,836,765	$1,015,067

The company estimates an increase in traffic and operating revenues in 1927 of 2¼ per cent over traffic and revenues of 1926.

The advantage of new equipment is shown in the statement of H. L. Geisse, general manager Wisconsin Valley Electric Company, Wausau. While 1926 has been better than 1925, both in gross and net revenue, the replacement of old cars with new, modern ones and the extension of bus service are expected to make a material increase in business. His statement follows:

Following are the statistics of this company for the last two years:

	1925	1926 (Estimated)
Passengers carried	2,772,203	2,981,553
Revenue	$131,410	$151,976
Operating expenses	$96,769	$113,445

The year 1927 bids fair to be a better year for street railway operations than was 1926. We have just replaced two of our older type cars with new double-truck, 52-seat cars built by the American Car Company. It is probable that during 1927 our urban bus operations will be extended. I would look to see the total passengers carried in 1927 run to 3,200,000, or an increase of approximately 7 per cent. A corresponding increase should take place in our revenues, with little if any increase in expense. The reason for this is that our operating expenses this year include a very high per cent of maintenance which was entirely abnormal.

We plan to spend about $30,000 the ensuing year on replacement of track.

In the far West conditions are remarkably steady, as is evidenced by the operations of the Portland Electric Power Company, Portland, Ore. The past year showed a trifle less revenue than 1925, with expenses slightly higher. The outlook for 1927 is that the past year's results will be duplicated, according to Vice-President W. H. Lines:

The following tabulation shows revenues, expenses, passengers carried and mileage for the years 1925 (actual) and 1926 (eleven months actual, one month estimated).

	1925	1926
Operating revenues	$4,835,977	$4,712,000
Operating expenses	3,520,894	3,567,000
Taxes	290,000	325,000
Bridge rentals	98,000	95,500
Revenue passengers	61,772,709	60,300,000
Transfer and free passengers	24,033,796	26,000,000
Car-miles operated	14,750,000	15,000,000

I cannot foresee any change in local conditions which would materially increase or diminish our revenue during the coming year, nor do I anticipate any great variation in expenses. I think, therefore, that it is safe to apply the 1926 figures as a forecast for 1927.

INCREASED RIDING IN THE SOUTH

In the South the industrial activity has not been so pronounced as in other sections of the country. Street railway revenues have shown an increase, however. The following statement by H. H. Flowers, president New Orleans Public Service, Inc., shows not only a healthy growth in riding for 1926, but an equal expansion this year:

Railway earnings for 1925 of the New Orleans Public Service, Inc., were $7,527,444. The estimated earnings for 1926 will be $7,627,092. For 1927 the forecast of earnings is $7,710,197. It is impossible to furnish comparison of expense, as we do not entirely segregate departments.

The Georgia Railway & Power Company, Atlanta, has had an almost equal increase in business. This system, however, segregates railway expenses. It is seen that there has been a large reduction in operating cost so that the net revenue for 1926 has been materially greater than in 1925. This year promises to show even better results, according to the following statement by Frank L. Butler, vice-president and general operating manager:

The result of the 1926 operation of Atlanta railway will show an increase in revenues of slightly more than $110,000, with a decrease in operating expenses of $130,000. We confidently expect 1927 to show conditions even more greatly improved. Our estimates contemplate increased revenue amounting to $81,000, with a further decrease in operating expenses of $48,000.

Properties operated by the Doherty interests cover a wide range of conditions. The largest city included is Toledo, while there are a number of smaller cities in which street car and bus service is furnished. The properties are separated into groups for convenience in comparison. Little change is expected in any of the groups, except that including Durham, N. C., where an expansion of the service, including the installation of bus lines co-ordinated with the car lines, has brought a 20 per cent increase in revenue, with the prospect that the net this year will be practically double that of 1925. Following is a brief review of the situation by R. F. Carbutt, of Henry L. Doherty & Company.

On the Missouri properties the gross for 1926 as compared with 1925 fell off about 4 per cent. It is anticipated that there will be a further recession in business in 1927. The operating expenses were reduced materially, largely on account of wider adoption of the one-man car. This resulted in an increase in the net for 1926 as compared with 1925. A further decrease in operating expenses in 1927 is expected, so that the net revenue will remain approximately the same as in 1926.

In Ohio all of the properties show a decrease in gross business in 1926 as compared with 1925. The operating expenses also decreased slightly, but there was a small decrease in the net. For next year it is anticipated that there will be a material increase in the gross revenue, with a slight further decrease in operating expenses. This will result in a considerable increase in the net income of these properties.

In the North Carolina group Durham is making the best showing, the 1926 gross revenue with a co-ordinated car and bus system being about 20 per cent over the last year's with street cars alone. It is expected that there will be a further gain of about 10 per cent in gross for 1927. Operating expenses increased in 1926, principally as a result of the expansion of the service, and as it is planned to expand further in 1927 the expenses will show an additional increase. Net operating revenue for 1926, however, is materially over that for 1925, and it is expected that in 1927 the net will be practically double that of 1925. While new capital has been added, the increased net is sufficient to provide a satisfactory return on it.

ON THE Toronto Transportation Commission's system, commencing in February of this year, each month has shown an increase over the corresponding month of last year, the improvement increasing each month. The improvement in 1926 will be about 2,500,000 passengers, or $150,000. Our expenses have remained approximately the same as 1925, or 28.5 cents per car-mile exclusive of depreciation. One-man car mileage is 15 per cent of the total. Our operating ratio of 62.8 is the same this year as last.

We believe and hope that business conditions will continue to improve during 1927; given the same improvement in 1927 as in 1926, our traffic will equal that of 1923, which was our peak year. *—D. W. Harvey.*

The miscellaneous properties of the company in general show a decrease in gross for 1926 as compared with 1925, and a small reduction in net. Economies are being introduced which will result in an increased net for 1927.

CANADIAN ROADS ALSO GAIN

Operating results obtained by two important systems in Canada indicate that conditions there practically parallel those in the United States. In Toronto the railway system now operated by the city has been established long enough that it reflects the conditions incident to general business rather than the change from private to public management. The decrease in riding which was experienced for a time has not only been checked, but there has been a steady growth in passengers and in revenue for practically a whole year. With the greater business it has been possible to maintain the same operating ratio, so that the net has gone up in proportion. Next year's business bids fair to be even better, according to D. W. Harvey, general manager Toronto Transportation Commission.

This system's traffic decreased slightly each month from July, 1923, to February, 1926—that is, in comparison with the corresponding month of the previous year. The decreases were due primarily to quiet business conditions and secondarily to the increasing use of private motor cars.

Commencing in February of this year each month has shown an increase over the corresponding month of last year, the improvement increasing each month. The improvement in 1926 will be about 2,500,000 passengers, or $150,000. Our expenses have remained approximately the same as in 1925, or 28.5 cents per car-mile exclusive of depreciation. One-man car mileage is 15 per cent of the total. Our operating ratio of 62.8 is the same this year as last.

We believe and hope that business conditions will continue to improve during 1927; given the same improvement in 1927 as in 1926, our traffic will equal that of 1923, which was our peak year.

"Motor coach" in this organization means vehicles employed in other than universal fare transportation and includes chartered coaches, sightseeing and school contracts. We operated our first motor coaches in the early spring of 1925; this year our motor coach gross will be more than $300,000, or about double that of 1925.

Good operating results have also been obtained in Montreal. Gross earnings have gone up 2.81 per cent and net earnings 7.08 per cent. With only a slight increase in fixed charges for the year, there was left a balance for the stock 58 per cent ahead of that in 1925. It is expected that the gain will continue throughout this year. This is indicated in the following statement by H. E. Smith, comptroller Montreal Tramways:

			Increase 1926 over 1925	
Revenue:	1926	1925	Total	Per Cent
Car earnings	$12,573,000	$12,216,000	$357,000	2.92
Miscellaneous earnings	327,000	331,000	—4,000	—1.21
Gross earnings	$12,900,000	$12,547,000	$353,000	2.81
Expenses:				
Operating expenses and taxes	$6,543,000	$6,244,000	$299,000	4.79
Operating profit	55,000	52,000	3,000	5.77
Maintenance and renewals	2,598,000	2,792,000	—194,000	—6.95
Total	$9,196,000	$9,088,000	$108,000	1.19
Net earnings	$3,704,000	$3,459,000	$245,000	7.08
Fixed charges	3,321,000	$3,217,000	$104,000	3.23
Balance	$383,000	$242,000	$141,000	58.22
Revenue passengers	207,829,042	201,503,238	6,325,804	3.14
Mileage passengers	24,917,169	23,657,062	1,260,107	5.33

I am sending you herewith a statement of the approximate results of operations for the year ended Dec. 31, 1926, compared with the previous year. With respect to next year, 1927, we expect a continued improvement of about the same proportions as 1926 over 1925.

Chicago Surface Lines Operates 100% of Equipment

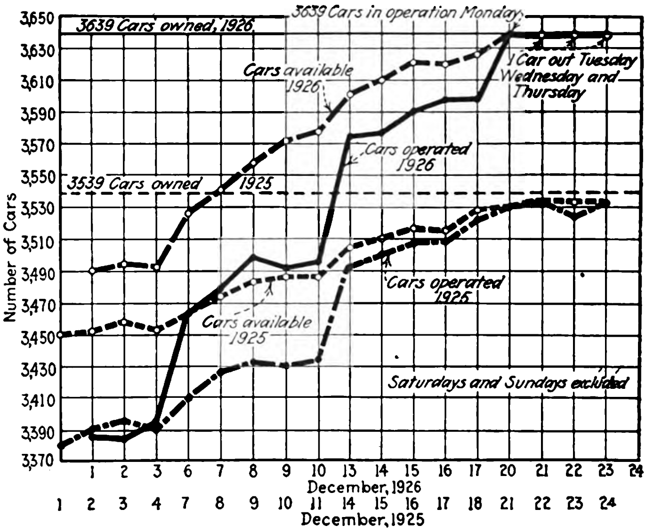
Co-operation Between Equipment and Transportation Department Makes Possible Operation of Every Car Owned by this Largest Street Railway System During Peak Day Before Holidays

A RECORD unique in the performance of electric railway properties in large cities was established by the Chicago Surface Lines during the peak shopping week immediately preceding the Christmas holidays. Riding during this period broke all records in the company's history, and exceeded the heavy volume of the Eucharistic Congress last June, at which time the hundreds of thousands of visitors in the Illinois metropolis threw a heavy load on all of the city's transportation facilities.

Dec. 18 was the biggest day in the history of the system. On that day 5,148,000 riders were carried. On Dec. 20 there were 4,959,686 rides; on the 21st, 4,853,400; on the 22d, 4,851,406, and on the 23d, 4,906,477. Revenue passengers for the year show an increase of 4 per cent over the corresponding period in 1925.

For a number of years, it has been the practice of the Surface Lines management to taper off overhaul work in the shops during the month of December, so as to make available a maximum number of cars during the period of heavy riding immediately preceding the holidays. Each year has marked the establishment of new records for the percentage of equipment made available for service during this period. This has been made possible by close co-operation between the equipment and the transportation departments, and by a continuous program of putting car equipment in first-class condition through regular overhauling and attention to maintenance details.

During a normal period the number of cars held in carhouses on the system for repairs averages 25.2 cars, or 0.7 per cent of the equipment owned. Cars in the two shops for overhaul and major repairs averages 117, or 3.26 per cent of the cars on the property. This makes an average of 142.2 cars per day held out of service for the mechanical department during a normal period. By arranging the maintenance program so as to make these cars available for service during the week of maximum load, an investment in extra equipment to meet a short annual peak is avoided. On the basis of $15,000 per car, this performance results in putting approximately 140 additional cars in service when they are most needed, at a saving in car investment of approximately $2,100,000.



100 Per Cent Car Service During Rush Period Was the Record in Chicago

Every car of the 3,639 owned by the Chicago Surface Lines was in service on Monday, Dec. 20, at the height of the Christmas shopping rush. The number of cars available for service each day during December, and the number actually operated, are shown in comparison with the corresponding period in 1925.

On the accompanying curves are shown the number of cars available for service and the number actually operated during the month of December, 1926, in comparison with the same period during 1925. Purchase of 100 new cars during the year increased the number on the property from 3,539 to 3,639. On Dec. 20, 1926, every car on the property was in operation carrying the heavy holiday load. On Dec. 21, Dec. 22 and Dec. 23 all cars but one were kept in service. This performance is particularly interesting in the light of the fact that this company operates entirely in city streets, through heavily congested traffic.

The record was made under winter conditions when slippery rails and pavements made traffic accidents particularly troublesome.

$263,830,000 Estimated for Equipment and Supplies in 1927

Essentiality of the Electric Railways Indicated in Forecast of Purchases for Maintenance and New Equipment for Coming Year—An Increase of 13.2 Per Cent Over 1926 Is Based on Extensive Survey—New Cars and Track Are Featured, While Bus Expansion Is on Slightly Lower Scale

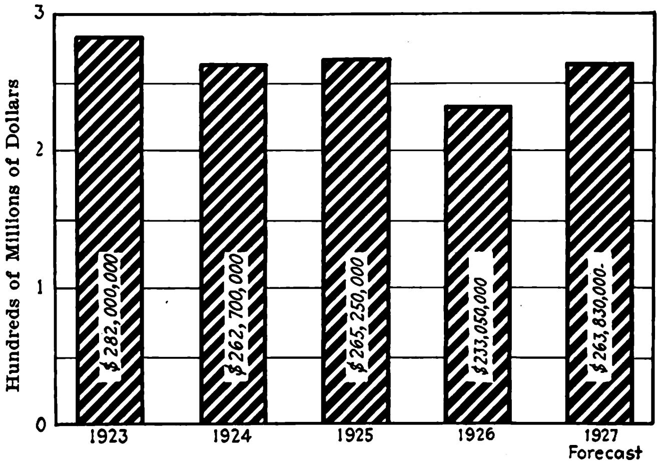
WITH the indication of increased expenditures for the year 1927, based on returns from companies representing half of the industry, it is a safe prediction that the railways will continue next year on a conservative basis. While the year just closed did not measure up to the forecast made a year ago, the replies received indicate considerably better results for 1927.

Actual expenditures for new plant and equipment for 1926 fell behind 1925 by about $7,000,000. The principal setback was apparently in the track accounts. Plans for track rehabilitation and extensions made a year ago have in many cases been delayed and are now estimated for 1927.

New cars will probably reach a total in excess of 3,000 for the coming year according to the compilation made from the returns received. These estimates are for small as well as large city properties. The total estimate for new cars and modern equipment for remodeling old cars is $55,000,000 an increase of nearly 38 per cent over that spent in 1926.

New electric power facilities show an upward trend. The actual figures for 1926 indicate an increase over the forecast made a year ago and 1927 promises a further increase. This reflects the installation of automatic substations and the continuance of the policy of changing from isolated generation to a basis of power purchased from central stations.

None of the estimates for new equipment or for



Total Expenditures for New Plant and Maintenance Materials and Supplies Show Industry Is Holding Its Own

A graphical representation of the purchasing power of a six billion dollar industry with a billion dollar annual income.

PURCHASES PLANNED BY ELECTRIC RAILWAYS FOR 1927, COMPARED WITH ACTUAL ESTIMATES OF PAST YEARS PREPARED BY "ELECTRIC RAILWAY JOURNAL"

New Plant and Equipment—Capital

	1922	1923	1924	1925	1926	Forecast 1927
Way and structures	$85,000,000	$74,000,000	$56,000,000	$52,400,000	$51,200,000	$64,400,000
Equipment ... Rail	38,000,000	78,000,000	60,200,000	50,000,000	40,000,000	54,950,000
Equipment ... Buses				15,680,000	17,540,000	15,410,000
Power	28,000,000	28,000,000	17,000,000	5,150,000	7,640,000	10,350,000
Total	$151,000,000	$180,000,000	$133,200,000	$123,630,000	$116,380,000	$145,110,000

Maintenance Materials and Supplies—Operating

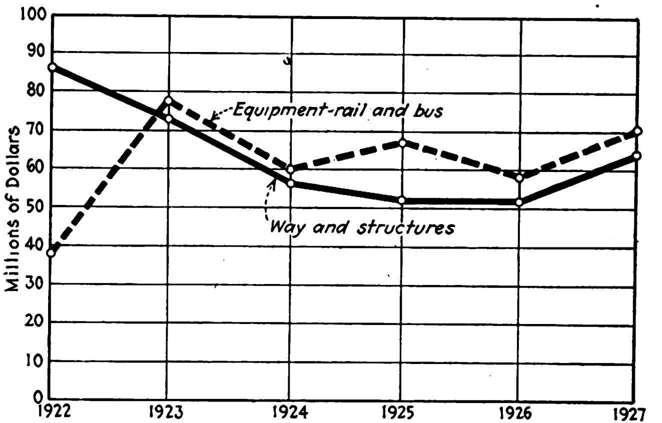
	1923	1924	1925	1926	Forecast 1927
Way and structures	$42,000,000	$57,500,000	$56,900,000	$50,000,000	$51,900,000
Equipment ... Rail	44,000,000	54,000,000	54,700,000	47,800,000	48,400,000
Equipment ... Buses			7,370,000	7,500,000	8,020,000
Power	16,000,000	18,000,000	22,650,000	11,370,000	10,400,000
Total	$102,000,000	$129,500,000	$141,620,000	$116,670,000	$118,720,000

TOTAL OF NEW PLANT AND MAINTENANCE MATERIALS AND SUPPLIES

	1923	1924	1925	1926	Forecast 1927
Way and structures	$116,000,000	$113,500,000	$109,300,000	$101,200,000	$116,300,000
Equipment ... Rail	122,000,000	114,200,000	105,100,000	87,800,000	103,350,000
Equipment ... Buses			23,050,000	25,040,000	23,430,000
Power	44,000,000	35,000,000	27,800,000	19,010,000	20,750,000
Grand total	$282,000,000	$262,700,000	$265,250,000	$233,050,000	$263,830,000

maintenance include the cost of purchased power or the cost of fuel of those companies that generate their own electrical energy.

Because of the rising importance of bus operation by electric railways the plan of separating bus equipment and new cars was first established last year and has been continued this year. It is expected that this item of bus equipment expenditures will be of ever increasing importance because of the relatively short life of rubber-tired vehicles as compared with that of electric cars. This year bus purchases are estimated at $15,410,000, a decrease of 11 per cent over those actually purchased during 1926.



New Plant and Equipment Expenditures Show Healthy Condition
Analysis of purchases in the past five years with the JOURNAL'S forecast based on a survey of the coming year indicate the stability of the industry and a sound expansion.

PROPERTIES WELL MAINTAINED

Maintenance accounts are about normal. The total for 1926 is lower than the forecast by the reduction in the power account alone equaling $11,000,000 and the forecast for 1927 shows a further slight reduction in the power group, again reflecting the gradual shift to a purchased power basis.

Bus maintenance shows an increase in 1926 and again in 1927 in proportion to the increase in buses operated by the railways.

FORECAST PREPARED ON A BROADER BASIS

This is the fifth forecast of ELECTRIC RAILWAY JOURNAL based on a survey conducted in December of each year. This year the survey was extended much further, questionnaires having been sent to a larger group of railway companies than heretofore in the United States and Canada. Replies have been received from over 200 companies, large and small, in all representing 50 per cent of the electric railway mileage.

Based on the replies received, the companies' returns for 1927 were totaled and prorated to cover the entire industry in the United States and Canada. In this proration not only car-miles and the number of cars operated are considered, but a study of the individual returns is made in order to eliminate the effect of unusual circumstances.

CONSTRUCTION FINANCED FROM PUBLIC FUNDS EXCLUDED

As usual these expenditures do not include construction or estimated construction of subways or elevated structures that are financed largely out of public funds. It is of interest to remember that enormous expenditures of this nature are now being actively considered or expended in New York, Philadelphia and Chicago. Much of the New York and Philadelphia work has been going on for the past year and it is quite likely that appropriations will soon be made and work begun on the first units of subway construction in Chicago and further extensions in New York. Likewise, expenditures for electrified steam railroads are not included in this forecast. Of greatest interest in this connection has been the completion of the Illinois Central suburban system out of Chicago during the past year. Heavy expenditures on the part of the New York Central Railroad; New York, New Haven & Hartford; the Virginian and the Great Northern were either made or are in progress at the present time.

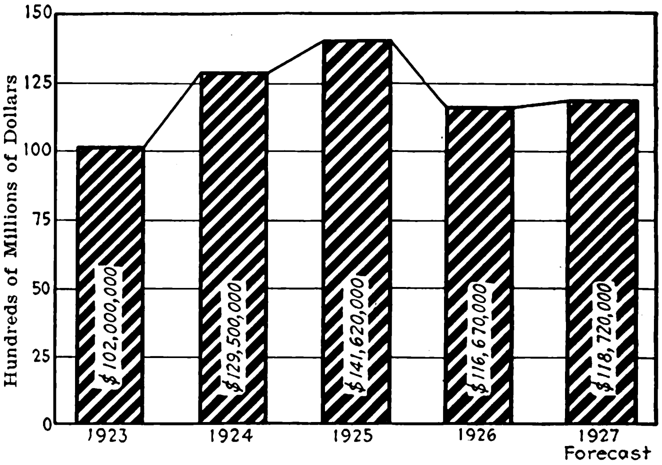
It should be borne in mind that the estimates given are only for the purchase of materials and supplies used in the operation of electric railways, and labor incident to the installation and use of such supplies has been omitted.

GASOLINE AND ELECTRIC POWER ADDITIONAL ITEMS

A factor of ever-increasing importance to gasoline and oil companies is the increasing use of motor fuel for the operation of buses. These figures do not include estimates of gasoline and oil consumption. Such figures, if available, would swell the purchases made by approximately $6,000,000.

About 13,000,000,000 kw.-hr. are used by the electric railways every year, half of which is purchased from light and power companies for the annual sum of $56,000,000. The remaining half that is generated in railway-owned power stations represents additional expenditures for fuel not included in the tabulation and charts presented herewith. It is interesting to note in this connection that the electric railways consume 17 per cent of the total energy generated in all power stations.

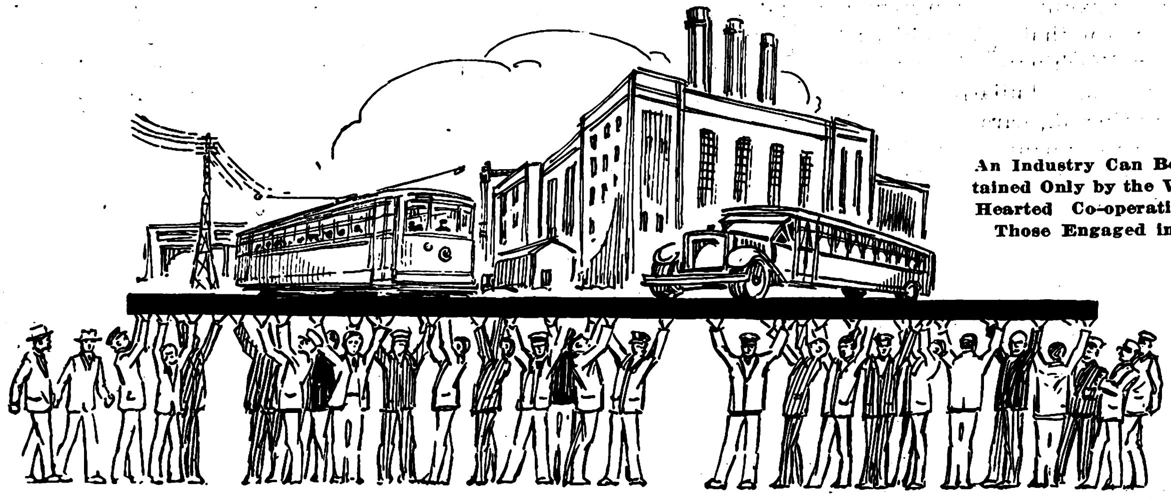
Coal purchased by electric railways for the 6,500,000,000 kw.-hr. generated would probably total $13,000,000.



Industry Is Maintaining Its Physical Property
About 12 per cent of the billion dollar income is spent for maintenance materials and supplies, not counting fuel for buses or power houses nor the cost of purchased power.

In all, the money spent for fuel by the industry or for purchased power totals $75,000,000 annually and is in addition to the estimate of materials and supplies shown herewith.

The estimate of expenditures is intended to show the purchasing power of the industry for manufactured equipment and supplies.



An Industry Can Be Sustained Only by the Whole-Hearted Co-operation of Those Engaged in It

With apologies to the Public Service Railway

Some of Us Would Be Homesick in Heaven

Such Are the People Who Could Read This Account and Not Subscribe to the View That Times Change and We Change with Them—The Plastic Age in Transportation Appears to Be at Its Height

By G. J. MacMurray

News Editor ELECTRIC RAILWAY JOURNAL

IT DID NOT escape Ben Franklin that dough begins with do. Neither has that fact escaped the attention of electric railway men. True, some of those who slipped on the banana peel eight or ten years ago are still sitting on the pavement talking of the cause of their fall rather than trying to regain the prestige lost, but the cases are few and far between. The old goods are being put up in new packages just as Mr. DeLamarter did in Grand Rapids and as many others have done and are doing all over the country. We are wooing the public.

It's not so much what you do as the way you dress up what you do that counts. Many of us who even now deplore the passing of the Old Cap. Collier stories haven't yet discovered that the series is still running, but that you have to pay $2 now for the old 10-cent stuff. Despite this, many sound efforts are being made to merchandise the service. We are even sloganizing the service. Why, less than 24 hours after the announcement had been made that the Penn-Ohio Electric Company had won the Coffin award, the cars and buses of that company appeared on the streets with a decalcomania on their sides apprising the public of the achievement of their company, for it is their company since many of them are stockholders. The idea was to catch the public eye. The motivating force was the same that prompted the stocking merchant mentioned by Mr. Wickwire in his inimitable speech to advertise "happiness hose—for contented calves." If a Nickelodian may be permitted, isn't Mr. Wickwire really the witwire of the industry?

The "appeal of appearance" idea has really made great headway. It would be physically impossible within the limits of an article such as this to crowd in mention of everybody deserving of credit for fostering this forward movement. Quoting Mr. Wickwire once again, "Anything can be done if no one cares who gets the credit." Not all has been done that might be done, but the preponderance of evidence is on the side of the industry's accomplishments. Those with the hardihood to do so may run the matter down in detail in the JOURNAL indexes covering the contents of the last two volumes.

It is not a case of being like Ikey's lawyer, who was left out in the cold. Ikey got into trouble and went to his lawyer.

"If I win this case, I will give you a thousand dollars," he said.

"Very well," said the lawyer, "get some witnesses."

Ikey got his witnesses and won his case.

"Well," said the lawyer, "you have won your case. What about my thousand dollars?"

"That's all right," said Ikey, "you get some witnesses."

The witnesses are here galore. Looking for evidence of progressiveness in the electric railway industry is like looking for Pike's Peak in Teller County, Colorado. You can't miss it. Clint Morgan over in Brooklyn, to cite just one instance, when he receives the last of the now impending order of new cars for his company, won't have a trolley in service that antedates 1920. That may not be the record in modernization, but it is offered as an exhibit for a system of its size. After all, it is the mirror that gets right back at you.

Down in Washington they went in for a new color scheme in cars. Similarly the Detroit United Railway began painting its cars in new colors, with the monogram of the company on the sides of the car in azure blue with a black border. These are merely recorded events. But both Mr. Storrs and Mr. Cobb have not hesitated to discuss frankly some of the basic factors of the electric railway situation. They and others have done the directing and the prescribing. Remember how the husband of the supersensitive wife said to a physician who had just given him a message for the wife:

"Doctor, would you mind telling her yourself?"

SPEAKING RIGHT OUT IN MEETING

Men prominent in the electric railway industry haven't minded telling the story themselves. At Cleveland T. A. Kenney, Alfred H. Swayne, E. B. Meissner, Samuel M. Curwen and others all dwelt upon the car as the show window of the industry. It was at this meeting that Thomas Fitzgerald of Pittsburgh said that winning the public support was the first step in selling city service, and it was at Cleveland that the Advisory Council outlined the fundamentals of success, the first of which was: "Obtain the friendly co-operation of the public." And by the way, the convention is going back to Cleveland next year. It was a great show, this one of 1926. Freddie Dell, who insists that figures tell the most forceful story, has supplied the final computation.

Say It with Figures, by Freddie Dell

Year	Convention City	Convention Registration	Percentage Increase or Decrease	Number of Manufacturer Company Members	Percentage of Increase	Number of Exhibitors at Conventions	Percentage of Increase	Total Space Sold, Square Feet	Percentage of Increase
1916*	Atlantic City......	3,271	.....	208	.....	125	.....	57,329	....
1917	New York City....	Conference only	.....	171	(D) 17.8	No exhibit	.....	No exnibit	....
1918	New York City ...	Conference only	.....	171	(D) 17.8	No exhibit	.....	No exhibit	....
1919	Atlantic City......	3,166	(D) 0.2	206	(D) 0.4	157	25.6	62,219	8.5
1920	Atlantic City......	3,300	0.9	200	(D) 0.3	136	8.8	59,529	3.8
1921	Atlantic City......	1,189	(D) 63.7	225	8.1	No exhibit	.....	No exhibit	....
1922	Chicago..........	4,200	28.4	244	17.4	141	12.8	61,895	8.0
1923	Atlantic City......	4,404	34.5	274	31.6	163	30.4	75,681	32.0
1924	Atlantic City......	5,804	77.4	330	58.6	192	53.5	86,349	50.5
1925	Atlantic City......	7,147	118.3	371	78.3	204	63.3	100,030	74.5
1926	Cleveland.........	8,623	163.5	423	103.3	271	116.9	119,007	107.7

*Figured on the basis of 1916 at 100 per cent.

Freddie is right. Those figures are mighty significant. In business it is buy-buy or by-by. As the vice-president of the General Motors Corporation said at Cleveland, speed in the personal car has modified the desires of the people with respect to service. Electric railways still render the best mass transportation, but people living away from car lines want service brought closer to their doors. And the electric railways are going right up to the front door for it. But correct equipment and facilities are needed if the best results are to be secured.

FIND THE JOB AND DO IT

It's a new order this, just like the one that came as a shock to the new office boy.

Boss: "Can't you find something to do?"

Office Boy: "Gee whiz! Am I expected to do the work and find it, too?"

That's just what is expected. It's what the Penn-Ohio system did; it's what the Pittsburgh Railways did with its two-bit football tickets; it's what the Chicago Surface Lines did in improving service in the face of many obstacles and an expiring franchise, and what the Key System Transit, the Chicago Rapid Transit Company and others did when their representatives went from door to door canvassing their prospective passengers. It's what the Bridgeton & Millville Traction Company, the United Railways of Providence, the Birmingham Electric Company, the Northern Texas Traction Company, the Terre Haute, Indianapolis & Eastern and others did when they erected posters and billboards. The Georgia Railway & Power Company, Atlanta, even used rotogravure copy.

Several electric railways have established parking areas at the end of their lines. An autoist leaves his car while attending to his business in town, rides downtown and back on the trolley cars, and then uses his automobile to reach his home. The railways in Philadelphia, Poughkeepsie, Fort Worth and Grand Rapids are following this plan. Sometimes a combination ticket permitting parking for the day and a round trip on the trolley line is sold. In Milwaukee there was a very successful open house week. So that its patrons might know beyond peradventure that they were not suffering from cold feet the United Railways & Electric Company is now hanging thermometers in its cars. To increase the morale among its men the Pittsburgh Railways and others virtually have valet services. Gentle reader, turn to the issue of Dec. 25, page 1138, if you have any doubts that a trainman can be made the glass of fashion and the mold of form! It was a story without words that the Utah Light & Traction Company told in this connection.

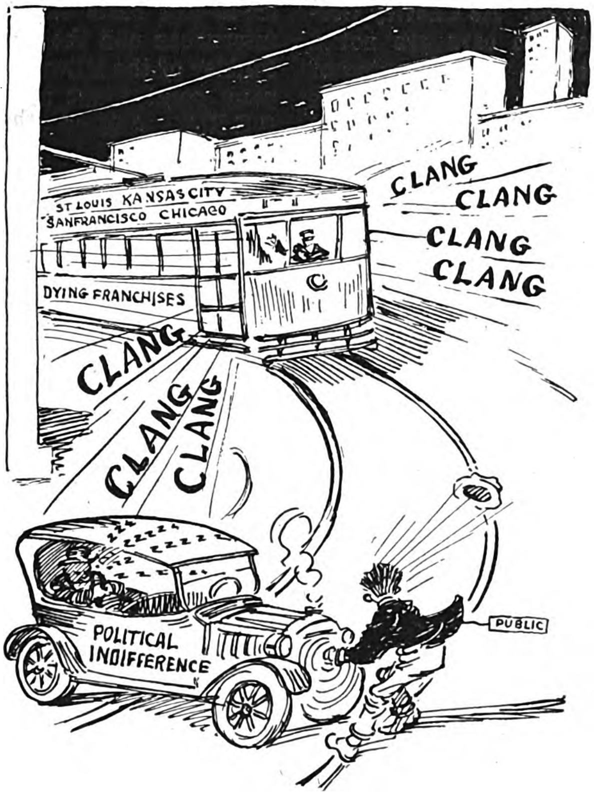
AD VENTURE PAYS

Slowly but surely it is being borne in on railway men that in all business the man who engages in the most ad ventures is surest to come out best. The Buffalo & Erie Railway, the Detroit United, the Illinois Traction and others are using electric signs at their terminals to advertise their service. The P. R. T., the Third Avenue Railway, the Seattle Municipal Railway and others have been on the air frequently with entertainment and a message. Even Santa Claus was turned to advantage at Christmas parties given by the Louisville Railway, the Beaver Valley and other companies. But no matter how much has been accomplished in the past the industry must look to the future and concentrate on things still to be done. The article "The Utility Powder Puff vs. the Utility Razor" in the JOURNAL for Jan. 6 reflected the sentiment of the flapper that "there are times when a pat on the nose is worth two on the back."

And as one checks up on the advertising campaigns in Chicago, in Baltimore, in Muskegon, the discussions at the conventions, notably the Southwestern

Public Service Association, and recalls the vogue of "A Texas Idea," again to mention just a few, one is reminded that the industry is turning to its own use the sentiments contained in the poem:

I would paint my name on the fences;
 I would picture my goods on the sheds;
I would send my cards to the brides-to-be,
 And call on the newlyweds!
I would make a list of the grand-dads,
 And the dear grandmothers, too;
Of the preachers and painters, the workmen and women,
 The poor and the well-to-do,
And I'd deluge them all with letters,
 Explaining their need of me!
I would picture my store as a bit of the town
 That everyone in it should see!
And when they arrived, I'd extend the glad hand
 The moment they entered the door,
With so hearty a greeting that after the meeting
 They would buy all the goods at My Store.



With apologies to the San Francisco Chronicle.

A Situation Serious for Everybody

YES, IT'S TRUE

And literally, it's true. Why, the Beaver Valley Traction Company entered the world of art and had a master painter picture the spirit of the local industries on the sides of a street car. It was this company's Beaver Valley girls that caused such a commotion at the Cleveland convention. It sounds like the good old days of the '90s when trolley excursions were quite the thing to read about the trolley shopping days in Jacksonville, Toledo, Seattle and other cities. Why, it is even likely that the electric railway will be charged with being a contributing factor to the flapper, for didn't a prominent Alliance lawyer thank the officials of the Stark Electric Railway for the passes? He said that he used the pass four times a day himself and then lets one of his children use it at night. It must have been this incident that inspired the muse to write the poem first published in our Convention Daily, which read:

Mary's Little Car

Mary had a little car,
 She drove to see the show,
And every time she tried to park
 The copper made her go.
And every time she tried to go
 The traffic made her stop.
She reached the theater just in time
 To see the curtain drop.
Now Mary has a little car
 That stays within a shed
And Mary goes to shops and shows
 In trolley cars instead.

Incidentally that little poem has gone the rounds pretty well, having even been reprinted in the *Wall Street Journal*. In that respect it is like the editorial on the value of the trolley car written by an editor down in Memphis, where they had a modernization parade like the one in Grand Rapids to celebrate the placing in service of 32 de luxe cars. And when rehabilitation is mentioned, don't forget the story of the come-back staged by the Steubenville, East Liverpool & Beaver Valley Traction Company, in which particular attention was paid to modernization of the rolling stock. So far as co-ordination of service goes Mr. Mitten seems to carry off the palm with cars, buses, taxis, airplanes and even a bank. Really the record of progress is astonishing. The late Elbert Hubbard said that if you want to know a subject write a book about it. Of course some one will arise to say that an optimist can always see the bright side of the other fellow's misfortune. Recalling some of the trying situations in this industry we are reminded that it is dangerous to tell a fat girl that she is "all wool and a yard wide." But no harm can come from thinking it just the same.

QUEEN MARIE MISSED A TREAT

Will Rogers had, of course, heard about the new Grand Rapids cars. All he knew about them until he visited Grand Rapids en tour in vaudeville early in December was what he had read in the newspapers. After he had looked them over on the ground he said:

"At that I didn't expect to find 'em quite so ritzy. You see, I couldn't forget those old splay-backed stubby ones they used to have when I was here 'way back before the war and used to do my stuff out to Ramona Theater at DeLamarter Lake. All I got to say is, Marie should'a seen 'em."

Will Rogers wasn't the only one to rub his eyes at the sight of the Grand Rapids cars in actual service. It is customary to cry loudly for a man of vision, and to call him visionary when we get him. The parade and the fanfare in Grand Rapids were more than justified. So were the similar celebrations in Memphis and Chattanooga.

Other instances of the application of new ideas in cars are supplied in the modernization of both interurban equipment and cars used in Akron, in the purchase of new cars by the Fitkin interests for use in Altoona, Scranton and Youngstown. Rolling stock improvements saved the small interurban described in the JOURNAL for Sept. 25, page 549. Similarly the installation of light-weight cars at Gary has been made to pay well. Toronto found modernization to be profitable. In fact, during the work of rehabilitation 490 cars have been scrapped there. Attractive cars put the Buffalo & Erie Railway on a paying basis. This road, which was a losing venture for sixteen years, is rapidly recovering its prestige with the aid of light-weight, one-man, speedy cars designed to attract passengers and reduce costs. Miami, Milwaukee, Chicago, Youngstown and many other cities went in for new cars on a large scale. A recapitulation of the situation in New York City made early in 1926 showed that the rapid transit lines here spent $9,000,000 in 1925 for car equipment. The Chicago Rapid Transit Company, operating the elevated lines, put on new cars with several features added that are intended to give greater comfort and convenience, although the new equipment is practically a duplicate of that already in service. As Charley Gordon said back in February, modern cars are not a panacea, but they are a step essential to the keeping of present business and the stimulation of riding. John A. Miller, Jr., discussed the value of new cars as proved by the experience of twenty railways in the JOURNAL for Sept. 25.

Still, habit is difficult to overcome. Remember the case of the retired colonel who had seen 40 years of active service who gave his body servant, long his orderly, explicit instructions:

Trainmen Are Becoming the Glass of Fashion and the Mold of Form

"Every morning, at 5 sharp, Sam, you are to wake me up, and say, 'Time for the parade, sir.'

"Then I'll say, 'Damn the parade!' and turn over and go to sleep again."

A lot of us, not only street railway men but many others, do not object to being reminded about life's parade, but we like to turn over and go to sleep again.

IT'S NOT THE QUESTION BUT THE ANSWER THAT'S BOTHERSOME

And it's something like this with the question of co-ordination. Many railway managers are like the boy at the college examination when the professor asked:

"Does my question embarrass you?"

"Not at all," said the boy. "It is quite clear. It is the answer that bothers me."

And it is the answer to co-ordination that bothers many railway men. In this connection good advice was given by B. W. Arnold, assistant general manager of the Chicago, North Shore & Milwaukee Railroad, when he urged the members of the Illinois Electric Railway Association at a meeting on March 17 to operate motor coaches for profit, not loss. He said that a pessimistic attitude toward the possibilities of motor coaches will inevitably result in loss. Too many railways have started bus operation with the thought in mind that the service must necessarily be run at a loss. Cincinnati appears to have tied in the bus effectively with its railway. In Cleveland more than 100 buses were tied in for operation with the lines of the Cleveland Railway in a period of six months. In New Jersey the bus business of the Public Service Transportation Company, affiliated with the Public Service Railway, has grown from 1,952,059 passengers in 1923 to 146,053,237 passengers in 1925. In New York City nearly all the railways are to be found among the more than 100 applicants for bus franchises now pending before the Board of Estimate. The Brooklyn companies alone want to run 77 miles of bus lines on twenty routes on a service-at-cost basis starting at a 5-cent fare. Even the interurban and the bus are being articulated, as R. H. Pinkley of the Milwaukee Electric Railway & Light Company pointed out at the Indianapolis meeting of the C.E.R.A. And so the evidence might be expanded almost at once.

With all due respect to others, no paper or discussion of the bus question during the year was more to the point than was the paper by Lord Ashfield presented at Cleveland. It was his contention, based on experience, mind you, that competition between electric lines and buses is wasteful, and should be abolished. All local service by surface cars, subways, buses and other conveyances, he maintains, should be rendered under single supervision. Some of the things he said are too significant not to be repeated. It will repay everybody concerned to read, mark, learn and inwardly digest this series of facts:

SOMETHING TO THINK ABOUT

"In Greater London the average speed of the underground trains is 18 m.p.h., including stops, or 24 m.p.h. where a limited number of stops only is made. Upon the tramways the average speed is 9.6 m.p.h., but upon the motor omnibuses in the built-up areas only 8.6 m.p.h. The speed of the operation of motor omnibuses has fallen owing to the combined effect of street congestion and restrictive legislation, and it is a matter of importance both to those who provide the streets and those who regulate them that a higher speed of operation should be secured for motor omnibuses straight away.

"The decline in speed tends to increase cost, for many elements of cost are determined on a time basis. It is another form of preventable waste. The average receipt per passenger upon the underground railways is 2.8d; upon the omnibus 1.8d and upon the tramways slightly less than 1.5d, but if the average cost of carrying a passenger is taken, it is found to be, upon the underground railways 2.1d, upon the omnibuses 1.5d and upon the tramways 1.3d, so that the margins, being the net receipts, left in respect of these three forms of transport are, respectively, 7d per passenger upon the underground railways, 2d per passenger upon the motor omnibuses and 0.15d per passenger upon tramways.

"So that their relative net earning capacity, if the railways are taken as 100, is 29 in the case of the omnibuses and 21 in the case of the tramways. If, then, the capital investment involved in the provision of these several forms of transport is investigated, it will be found that this capital represents an investment, per passenger carried in the year, of 34d in the case of underground railways, of 5d in the case of tramways, and of 1.5d in the case of motor omnibuses. Then if the net receipts per passenger are brought into relation to the capital expenditure, per passenger, it will be found that if motor omnibuses may this time be taken as 100, the economic capacity of the tramway is only 21, and of the underground railways, on account of their enormous capital expenditure, only 15."

Of course as an abstract question the laborer is worthy of his hire. But let him get it, some one rejoins. Yes, that's the point. But the railways haven't done so badly. The present average fare is 7.42 cents. Dallas finally came into its own in this respect, the city realizing that an advance in rates to 7 cents was imperative if extensions and improvements were to follow. In that case an arbitrary fare theory was broken and the franchise amended. Louisville also got a 7-cent fare and a new franchise. Fares on the Key System in Oakland were raised last January. An 8-cent fare went into effect in Rochester early in the year. In the JOURNAL for Jan. 23 John A. Dewhurst went over all the ground in the Philadelphia fare case. The fare matter remains unsettled in St. Louis. There the issue is tied in with the question of the new franchise and the reorganization. One of the big accomplishments of the year was the change in the terms of the Tayler franchise in Cleveland. The modified grant there was adopted after extended negotiations. The first important application of the service-at-cost idea was in that city. There was nothing the matter with the principle on which the grant was based, but the ordinance was inflexible. The new grant there runs until 1950 and raises the possible maximum fare to 10 cents instead of 6 cents, and it fixes the rate in contiguous suburbs 1 cent higher than the Cleveland rate. It also increases the barometer fare fund to a lower limit of $500,000 and an upper limit of $1,000,000.

In Kansas City the grant of the Kansas City Public Service Company has been extended another twelve years. Cincinnati began to operate under its new service-at-cost grant late in 1925, but it was not until 1926 that the first figures of results were available. They were favorable. In January Toledo began to talk about a new franchise. It is still talking, just as they are doing in Chicago, New York, Jacksonville, etc. Anyway, there certainly has been a lot more heat than light in the Chicago and New York situations. Mr. Insull blames politics for the Chicago situation. He's right. The same cause is at the root of the trouble in New York and most of the other cities, but lack of a united front on the part of transportation companies is a contributing factor.

As one reviews the political situation and sees the mess into which some of the cities have fallen because of the attitude of opposition and inaction by the governing bodies, one is reminded that some figure hound has said that the average politician's vocabulary consists of about 500 words. A small stock, indeed, but oh! what a turnover. Politicians remind you of Moses. Every time they open their mouths the bull rushes. That may not be elegant, but it is forceful. Indeed, one of these situations is so bad with respect to some of the personalities involved that the story is recalled about the rich man of Depew's acquaintance who went back to his home town for a visit.

"Is it really true," an old chum of his boyhood days inquired, "that you are getting $10,000 a year?"

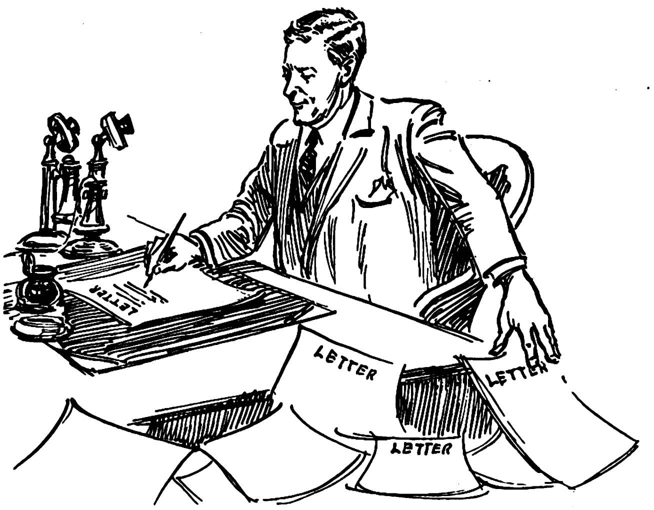
"Why, yes," said the man addressed, "a good deal more than that."

"Well, b'gosh," said the questioner, "ain't it wonderful what gall and circumstance will do for a man."

For the benefit of those who are interested in the economics of the situation they are reminded that L. R. Nash discussed tendencies in regulation, franchise terms, taxes and rates of fare in the JOURNAL for June 5; that Louis E. Gettle, chairman of the Wisconsin Railroad Commission, discussed Wisconsin's experience with the indeterminate permit in the same issue, and that the Railroad Commissioners in annual convention in Asheville in the fall went on record in favor of this form of grant.

Somewhat akin to these problems was the fixing of the $77,000,000 valuation for the Baltimore property last March. The valuation principles which governed in the presentation of this case were made the subject of a series of articles contributed to the JOURNAL by the late W. H. Maltbie, counsel for the United Railways & Electric Company.

As usual there has been a lot of substitution talk. The most notable instances have been in New York and Chicago. Brief mention has been made before of the New York proposal. It was given a wrong angle by the newspapers, this substitution proposal, so much so that both the association and the JOURNAL urged transportation men to supply the facts to their communities. This was done because the newspaper comment reflected colossal misunderstanding on the part of the press not only of the New York conditions, but of the general transportation question. And speaking about informing the public, isn't that just what such letter writers are doing as Mr. Richardson in Chicago, Mr. Dahl in New York, Mr. Barnes in Louisville and Mr. Henderson in Seattle, each according to his light?



Apologies to the New York World.

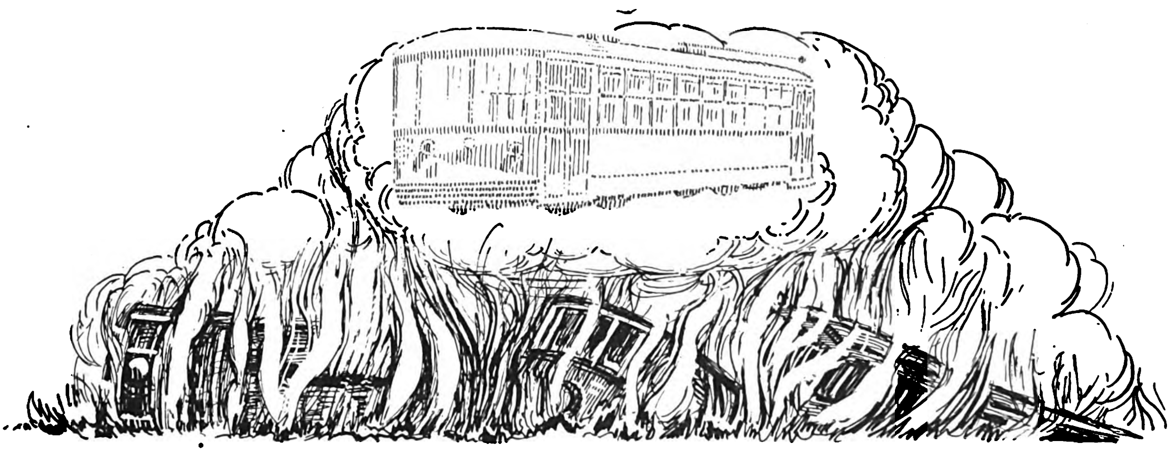
Informative Statements Are Helping in New York, Chicago, Seattle and Louisville

It was at the meeting of the Board of Estimate in New York in June that Mr. Dahl, the Brooklyn-Manhattan chairman, warned New York against scrapping its trolleys and declared that buses on anything but short routes could not be operated profitably for a 5-cent fare.

In London bus service was reduced to relieve congestion and to protect the tramways. Just as in New York, so the Berlin substitution program proved to be greatly magnified. An authoritative article in the JOURNAL at the time spiked this canard. Not only that, but the transportation expert who answered the inquiry said that if buses were substituted for cars in local service in Berlin the fares would have to be doubled.

OPERATING RATIO IS LOWER

Of course, the whole statistical record cannot be told, but it is of interest to reiterate the fact that details of operation from railways representing 90 per cent of the carrying capacity of the industry show an improvement in the net income. There was a slight decrease in traffic, but this was offset by lower operating costs and increased efficiency. The operating ratio in 1925 was slightly lower than in 1924. Most of the larger city systems did well. Chicago Surface Lines continued to handle record traffic. The Brooklyn-Manhattan Transit System reported record net and gross. This road has made a great financial comeback. It has been improved physically, too. Net for the year ended June 30, 1926, was $5,748,187. The measure of the success of the receivers of the Kansas City Railways in operating that property was shown by the fact that $5,000,000 was turned over to the special master by them at the termination of the receivership. The Chicago, North Shore & Milwaukee Railroad, probably the premier interurban electric railway of the world, reported an increase in net of $79,910. Right here it may not be amiss to mention a particularly outstanding achievement recorded in greater detail elsewhere in this issue. At the beginning of the last week before the Christmas holidays the Chicago Surface Lines succeeded in keeping every one of its 3,639 cars in operation. According to Professor Richey, writing in the JOURNAL for Feb. 13, ten-year statistics show that railways in large and small cities have had increases in revenue and traffic per inhabitant and show more economical use of cars.



Out of the Ashes of the Old Arises the New, Phoenix-Like

SOME SAD THINGS

Of course there were some sad things said during the year. There was Mr. Loree with his remark about the $6,000,000,000 investment in the electric railways being wiped off the books. My! what a stir that caused. Then there was Professor Ripley with his attack on the contents of most annual reports and his warning about holding companies. Apparently the professor holds to the opinion that scrambling the eggs doesn't help much if there is one bad one in the lot. ELECTRIC RAILWAY JOURNAL found itself in the company of the *Wall Street Journal* when it said that to publish a mass of technical and non-correlated facts is not to meet the stockholders' legitimate demands. The investment bankers feel very much the same way about it, as the JOURNAL for Oct. 23, page 776, records. As for the receivership record, that is shown elsewhere in this issue. The receivership of the Chicago Railways was unfortunate, but could hardly have been avoided under the circumstances. There is no default in this instance.

An unusual development in the wage situation of the year was the adoption by the Philadelphia Rapid Transit Company and its employees of a wage dependent on the purchasing power of money. The relations between management and men on the Philadelphia system have been most cordial under Mr. Mitten and on a co-operative basis. Jointly the men own about one-third of the common stock of the company. The wage schedule adopted in March, 1926, provided a reduction in the hourly wage scale, based on a reduced index of the cost of living, from 77 cents to 73½ cents. There were many other amicable adjustments of wage matters during the year, but there was strife in a few instances. The strike in Indianapolis assumed a serious aspect, very serious for the labor leaders who were sent to jail, but the strike in New York petered out quickly, as did the one in Akron.

ACCIDENT REDUCTION WORK GETS RESULTS

A feature of the year in legislation has been the consideration by Congress of a bill to control and regulate interstate bus carriers. A committee of the Interstate Commerce Commission conducted hearings in different parts of the country during the summer to secure evidence in regard to the need for such regulation and the form it should take. In most states where there is regulation of electric railway lines there is also state regulation of bus lines, but it has been held that the power of the state regulatory bodies over interstate bus lines is very limited.

Ever-increasing attention is being given to the matter of accident reduction. A part of this work has been done by safety campaigns among the public, as by posters, safety talks in the public schools and co-operation with state, municipal and civic bodies in the prevention of traffic accidents. Part of the result has come from educating the employees in accident prevention work and in stimulating them to greater efforts along these lines, in some cases by bonuses or other awards for immunity from accidents. The work naturally is one of slow progress, but gradual improvement is being made. Thus the joint committee on accident prevention of the American Electric Railway Transportation & Traffic and the Claims Association reported in October that 172 companies had shown a decrease of 3.25 per cent in the total number of accidents reported in 1925 as compared with 1924, and reduction of 5.42 per cent in total cost of claims, 147 companies reporting. On the basis of the reports of 145 companies, the average ratio of cost of accident to gross earnings fell from 3.12 per cent in 1924 to 3 per cent in 1925. As for the work of the Claims Association, the head for the account of the meeting of that body in the JOURNAL for Oct. 16 read: "Physicians and Surgeons Discuss Operating Problems." Quite appropriate! Quite appropriate!

SURVEYS OF STREET CONGESTION

Because of their use in the streets electric railways are keenly interested in all movements to reduce the street congestion and expedite the movement of traffic. For this reason steps taken to improve traffic conditions have the hearty co-operation of electric railways. Individually, also, many of them are helping in various ways to solve this problem, by conducting various traffic counts. Among the surveys made through the special assistance of the electric railways have been some to determine the proportion of shoppers at the principal department stores in a city who reach the store by trolley and by other means of transport. Surveys of this kind, it is believed, should be of assistance to the retail merchants of the city in helping them determine the policy as to the extent to which parking by automobiles should be permitted. Perhaps the most extensive survey of this kind conducted during the year was in Cleveland during three days in the early part of June, 1926, and the toll of customers was taken in 22 stores. They were not only the largest in Cleveland but represented a great diversity of goods sold. Each customer was interviewed and given a ballot as she or he entered the store on the day in question, the ticket being so arranged that a person could very easily indicate whether travel to the store by that individual was by bus, street car or private automobile or by water. A similar poll was taken among the employees of these stores, the result being travel by street cars 64.2 per cent, travel by private automobiles 21.8 per cent, travel by buses 10.1 per cent and walking 6.9 per cent.

In connection with the subject of accident reduction, greater attention is being given to the selection, training and periodical physical examination of motormen. Owing to the increasing use of one-man cars, this means that practically all transportation employees are concerned. A few companies give a physical examination to such employees of more than 50 years of age as often as once a year. The examinations of applicants for employment also include more attention to psychological tests than formerly, and at least two companies, those in Milwaukee and Philadelphia, have established extensive tests of this kind to govern the selection of trainmen.

Among the globe trotters of the year were W. H. Sawyer, shortly after his return from Australia elected president of the American Electric Railway Association, and Managing Director Storrs, who combined business with pleasure in a brief visit to Europe. How each of these men felt about it was, of course, duly recorded in the ELECTRIC RAILWAY JOURNAL. Another European observer was James A. Emery, vice-president of Ford, Bacon & Davis. Each of these men had something significant to say. It is certainly apparent that the British are on their toes with respect to improvements in railway rolling stock. More than 675 new cars were included by them in recent orders. Much reconstruction has been done to promote passenger comfort, notably on the London underground. The municipal managers in Great Britain are greatly excited over the inroads on their traffic by unregulated bus lines.

In the field of heavy electric railroading there were several very important events. On Aug. 7 the first train of the electrified suburban service on the Illinois Central Railroad of Chicago was run. The cost up to June 30, 1926, was $52,377,000, and it is expected that, compared with steam traction, about 12 per cent more suburban trains will be run, the passenger-carrying facilities will be increased about 6 per cent and train schedules will be speeded up from 7½ to 30 per cent. While the Staten Island Rapid Transit Company completed the electrification of its lines and began service with electricity as motive power on Dec. 24, the detailed account of the matter appeared in the JOURNAL for Jan. 2. Also in January the Long Island Railroad announced that $12,000,000 would be spent between 1926 and 1929 for electrification. Another significant installation is the application of electricity to 150 miles of the Piedmont & Northern Railroad at a cost of $15,000,000. The Skokie Valley route of the North Shore was completed and placed in service on June 5, one year almost to a day from the date construction was begun. This is a $10,000,000 installation. Similarly the so-called South Shore Line was completely rehabilitated. Construction of the rapid transit system in New York intended to be independently operated continues, but elsewhere, notably in Chicago, Pittsburgh, Cleveland, St. Louis and other cities, not much progress is to be reported with rapid transit projects.

There is nothing much new to recount about the municipal railway systems. Mr. Wallace, the manager of the Detroit system, is leaving on Jan. 1. Mr. Henderson is engaged in defending the local Seattle system from the attacks of a band of local taxpayers led by a Mr. Asia.

TIMES ARE CHANGED

But it is pretty near time to stop. No apologies appear to be needed for any of the things said. It might be well to explain that the journalist who does not interpret events as he sees them fails of his mission. Frequently he is misunderstood and maligned for his pains, but that is part of the price he pays. A natural optimist, he is forced at times to utter truths that estrange him from his contemporaries. A stern believer, he is often under suspicion. He is a prophet, but like the prophet he is often without honor in his own country. He consorts with kings, but is often rebuked for reproving them. He senses the debacle in advance of its coming, but is damned for his admissions. When change becomes a fact, he turns his attention to other things, for he is interested in the past only as it points the way to the future.

The changes of the past in this industry have merely reflected the changes in the outlook of the men responsible for them. Electric railway men of the past were good transportation men, but they saw only the electric car. They were good operators as operators go, but many of them failed quickly to appreciate the place of the bus. They lived in a world largely motivated by advertising, but they failed to appreciate the place that advertising plays in all merchandising. They wanted the best for themselves, but they failed to sense the same desire in others for modernization. They failed in some other ways, but they were not totally lacking in the desire to learn. And in that quality lies the seed of wisdom. Again is it well not to forget the Latin expression: *Tempora mutantur, nos et mutamur in illis.* Times change and we change with them. Never was this truer of an industry than it is today of the electric railway industry.

Increased Purchases Reflect Growing Interest in Car Improvement

Returns for Year Show Cumulative Activity in Purchases of Surface and Rapid Transit Passenger Equipment—Beginning of Comprehensive Replacement Program Evidenced by Increased Scrapping Rate—Buying of Standard Freight Cars Brings Interurban Totals Above Those for 1925

NEW ROLLING STOCK ORDERED DURING LAST FIVE YEARS

	Passenger Cars			Express, Freight, Service, Locomotives and	Grand
Year	City	Interurban	Total	Miscellaneous	Total
1922	2,912	187	3,099	439	3,538
1923	2,915	427	3,342	687	4,029
1924	1,985	538	2,523	1,569	4,092
1925	1,054	320	1,374	285	1,659
1926	1,249	309	1,558	324	1,882

REPORTS of new rolling stock ordered during 1926 show that there has been a substantial increase in the total cars over the purchases in 1925, but the number of new cars still remains below replacement requirements. Cars are being scrapped at an increased rate and the total junked during 1926 about equals the number of new cars purchased. However, when analyzed carefully, the majority of the cars junked were used for city passenger service, so that the number of new cars purchased for this purpose appears to be entirely for replacement.

The statistics of new rolling stock given in the tables and charts herewith show that a total of 1,882 new cars and electric locomotives were ordered during 1926. This is an increase of 223 cars over the total of 1,659 bought in 1925; but the 1926 total is still less than half of the number purchased during either of the years 1923 or 1924. When analyzed in detail, the 1926 statistics show increases in the purchases of rapid transit cars, city surface passenger cars, freight cars and electric locomotives. There are slight decreases from the 1925 figures in the number of new interurban passenger cars purchased and in the total number of miscellaneous service cars bought.

Interest naturally centers in passenger car purchases. Comparisons for the two years show 932 city surface passenger cars bought during 1926, as compared with 894 in 1925; 317 rapid transit motor cars purchased during 1926 as compared with 160 during 1925; and 309 interurban passenger cars bought during 1926 as compared with 320 in 1925. The total purchases of interurban cars for all classes of service exceeds those of 1925 due to the inclusion of 186 standard freight cars, whereas only 155 freight cars were bought in 1925. Analysis of the number of miscellaneous, service and work cars, not including electric locomotives or freight cars, shows 66 purchased during 1926, as compared with 83 for 1925.

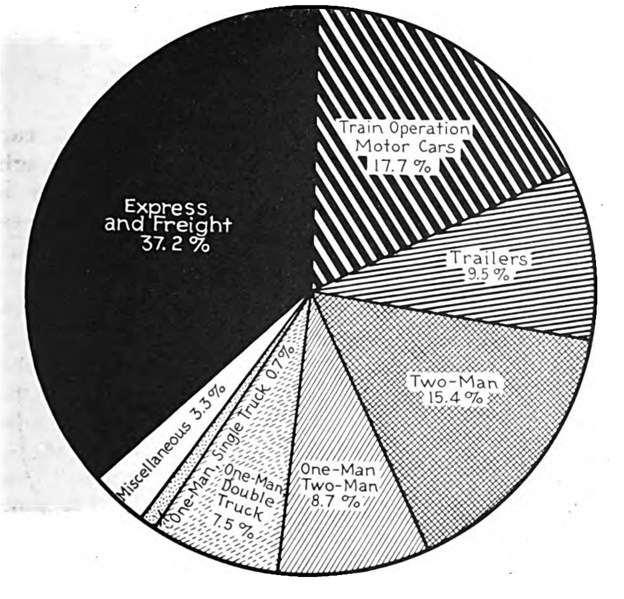
Special comparisons of new cars purchased during 1926 are given in table V. This shows that a total of 108 railways in the United States and Canada purchased new cars. This total is made up of 101 for the United States, one extraterritorial, and six for Canada. Of the cars purchased for city service, 574, or more than 44 per cent, were of the one-man, two-man type. Motor cars purchased for rapid transit service come next in the list with a total of 317, or nearly 25 per cent of the total city cars.

Straight one-man cars of all classes were bought in increased numbers as compared with 1925, there being a total of 210 purchased during 1926. Of these 66 were single-truck cars with 28-ft. bodies, 23 were single-truck cars with bodies longer than 28 ft. and 121 were double-truck cars. The total one-man cars purchased represents approximately 16 per cent of the total cars purchased for city service. One-man, two-man cars for city service total 574. The number of city cars designated as two-man type purchased during 1926 was 139, but of course many of the cars in the one-man, two-man class are used with two men during high peak periods.

Just what types of cars are being bought in greatest proportion, both of city and of interurban types, are shown in graphic form in diagrams on pages 21 and 22. The analysis of interurban cars purchased shows that freight cars are in the lead. Of the interurban passenger cars those purchased for train operation were more numerous, there being 92 motor cars and 49 trailers, or a total of 141 interurban cars of these types. Next in the interurban passenger car classification come 80 of the two-man type. There were 45 one-man, two-man interurban cars and 43 one-man cars. The diagram which shows the proportions of each class indicates that more than 37 per cent of the total interurban cars are for freight service. This large number of freight car orders is due unquestionably to the adoption of the standard design originated by the Central Electric Railway Master Mechanics' Association. Railways in the Central States were in need of added freight equipment and the bringing out of this standard design stimulated sales.

In order to show the rise and fall in popularity of the one-man car a special chart has been prepared. One-man single-truck cars with 28-ft. bodies, the original safety cars, first made their appearance in 1916. This type increased in popularity up to 1920, when a total of 1,699 were purchased. Since that time the number has decreased rapidly. During 1926 only 70 cars of this type were purchased. Single-truck cars with bodies longer than 28 ft. were purchased in greatest numbers in 1922, and since then the number has fallen off and one-man, two-man cars have been increasing in popularity. The total of 574 of the latter type, which were purchased during 1926 for city service, is greater than for the years 1922 and 1925, but only about half those purchased during 1923 and 1924.

There were 22 electric railways that ordered twenty or more cars during 1926, an increase over 1925, which shows but seventeen such railways. Of these 22 roads the Philadelphia Rapid Transit Company ordered 150 rapid transit motor cars and 50 city double-truck motor cars. The Boston Elevated Railway purchased 100 city rapid transit motor cars, nine work cars and four sweepers. Other large purchases of rapid transit cars included the Brooklyn-Manhattan Transit Corporation, which ordered 67 rapid transit articulated cars, each consisting of three bodies on four trucks; twelve freight cars, and a supply car. The Long Island Railroad purchased 60 suburban motor cars and 30 trailers for train service, and the New York, New Haven & Hartford Railroad purchased twelve motor cars and fifteen trailers for suburban electric train operation. The New York, Westchester & Boston Railway and the Pennsylvania Railroad each purchased twenty motor cars for use in suburban passenger train service.



This Shows the Various Types of Interurban Cars Purchased Last Year as a Per Cent of the Total for This Class

Of the railways to purchase cars for surface city passenger service, the Chicago Surface Lines obtained the greatest number, 100 motor cars. The Georgia Railway & Power Company purchased 60 city motor cars and ten interurban motor cars. The Montreal Tramways and the Pittsburgh Railways each purchased 50 motor cars for city service.

Table I—New Rolling Stock Ordered Since 1907

Year	Passenger Cars City	Passenger Cars Interurban	Freight and Miscellaneous Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	505	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276
1922	2,912	187	405	34	3,538
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092
1925	1,054	320	238	47	1,659
1926	1,249	309	264	60	1,882

(a) Included in "Freight and Miscellaneous Cars."

As regards large purchases of cars, there were three companies that bought 100 or more cars in 1926, while there were six that purchased a total of 100 or more cars in 1925.

Details of rolling stock ordered by individual companies are given in Table VII which follows this article on pages 25, 26 and 27. The arrangement of this table is the same as that used in preceding years. The railways are arranged alphabetically, according to states. The United States is then grouped into five geographical divisions, while the Dominion of Canada and territories outside of continental United States are each grouped separately. In addition to listing the number of cars ordered by companies, the table shows the class of car and type of service. It also gives data as to length, seating capacity, weight and number of motors.

As in past years the states of Pennsylvania, Ohio and New York lead in the total number of cars purchased, there being 326 reported for Pennsylvania, 252 for Ohio and 215 for New York. In Pennsylvania the cars are mostly for city service, there being 291 city cars and but 35 interurban cars. In both Ohio and New York the interurban car totals exceeded those for city service, Ohio having 176 interurban cars and 76 city cars, while New York has 119 interurban cars and 96 city cars.

Multiple-bodied articulated cars are being used in increasing numbers for service where a large number of passengers must be carried. Three companies report the purchase of 89 units of this type. Of these units, 67 purchased by the Brooklyn-Manhattan Corporation

Table II—Special Comparison of New Rolling Stock Ordered by Years

	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars	108	94	119	167	145	94	172	160	140	182	250
City Service											
Number of one-man cars (28-ft. body S. T.)	66	55	103	312	772	565	1,699	1,383	644	280	187
Number of one-man cars other than 28-ft. body	144	74	96	183	227	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars	574	512	1,224	1,076	471	.....	.....	.....	.....	.....	.....
Number of two-man passenger motor cars*	456	405	537	1,097	1,290	383	847	635	1,068	1,316	2,731
Number of passenger trailers	9	8	25	247	150	111	343	111	130	402	128
Service cars	52	70	44	121	103	47	104	31	(a)	(a)	(a)
Total cars city service	1,301	1,124	2,029	3,036	3,015	1,106	2,993	2,160	1,842	1,998	3,046
Interurban Service											
Number of one-man cars	43	3	61	56	40	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars	45	70	38	38	9	.....	.....	.....	.....	.....	.....
Number of two-man motor cars*	172	207	435	330	122	103	195	96	200	158	303
Number of passenger trailers	49	40	4	3	16	26	32	32	55	27	71
Number of freight, express and miscellaneous cars	212	168	1,494	474	302	34	361	141	(a)	(a)	(a)
Total cars interurban service	521	488	2,032	901	489	163	588	269	255	185	374
Total number of cars	1,822	1,612	4,061	3,937	3,538	1,269	3,581	2,429	2,375	2,406	3,911
Number of electric locomotives	60	47	31	92	34	7	17	18	44	49	31

* Includes motor and trail cars for subway, elevated and train service. (a) Not available.

Table III—Companies Purchasing 20 or More Passenger Cars

Philadelphia Rapid Transit Co.	150	rapid transit motor cars and 50 city motor cars
Boston Elevated Railway	100	city rapid transit motor cars, 9 work cars and 4 sweepers
Chicago Surface Lines	100	city motor cars
Long Island R.R.	60	interurban motor cars and 30 interurban trailers
Brooklyn - Manhattan Transit Corp.	67	rapid transit articulated cars each with 3 bodies on 4 trucks, 12 freight cars and 1 supply car
Georgia Ry. & Power Co.	60	city motor cars and 10 interurban motor cars
Cincinnati, Hamilton & Dayton Ry.	16	city motor cars, 10 interurban motor cars and 40 freight cars
Montreal Tramways	50	city motor cars
Pittsburgh Railways	50	city motor cars
Ohio Valley Electric Ry.	46	city motor cars
Milwaukee Elec. Ry. & Lt. Co.	40	city motor cars and 4 sweepers
Dallas Ry. & Terminal Co.	30	city motor cars and 2 work cars
Memphis Street Railway	32	city motor cars
Market Street Railway	29	city motor cars and 2 cable cars
Arkansas Power & Lt. Co.	30	city motor cars
Virginia Elec. & Power Co.	30	city motor cars
Chicago, South Shore & South Bend Railroad	25	interurban motor cars, 2 parlor cars and 2 dining cars
New York, New Haven & Hartford Railroad	12	interurban motor cars and 15 trailers for train operation
Hamilton Street Railway	24	city motor cars
Columbus Ry., Pwr. & Lt. Co.	23	city motor cars
N. Y., Westchester & Boston Ry.	20	interurban motor cars
Pennsylvania Railroad	20	interurban motor cars

each consist of three bodies on four trucks; twelve units constructed by the United Railways & Electric Company of Baltimore consist of two bodies on three trucks, and ten units purchased by the Washington, Baltimore & Annapolis Electric Railroad consist of two bodies on three trucks.

Purchases of electric locomotives during 1926 are listed in Table IV. The total number of new electric locomotives is 60 as compared with 47 purchased during 1925. The Pennsylvania Railroad was the largest purchaser, ordering 21 locomotives of 192 tons and two of 150 tons. The remaining 37 electric locomotives purchased were divided among twelve companies.

For convenience in comparing rolling stock purchases during the past twenty years and in order to show at a glance the quantities of cars purchased as divided between city and interurban passenger cars and freight, express, service and miscellaneous cars, Table I gives the total number of cars ordered each year beginning with 1907. Rolling stock purchases are divided into four classes: First, city passenger cars; second, interurban passenger cars; third, freight, express and miscellaneous cars, and fourth, electric locomotives. In this classification cars for electrified steam railroad suburban service are included with interurban cars. The miscellaneous cars include service cars, snow plows, sweepers, work cars, etc.

Table IV—Electric Locomotives Ordered During 1926

Name of Railway	Number	Weight, Tons	Length Over All, Ft. In.
New England States			
New York, New Haven & Hartford R.R.	5	180.00	68—6
	3	90.00	37—6
Eastern States			
Baltimore & Ohio R.R.	2	120.00	39—6
Long Island R.R.	7	150.00	......
	1	25.00	......
New York Central R.R.	1	125.00	43—6
Pennsylvania R.R.	2	150.00	......
	21	192.00	65—2½
Central States			
Chicago, Aurora & Elgin R.R.	2	50.00	......
Chicago, South Shore & South Bend R.R.	4	80.00	40—0
Cincinnati, Georgetown & Portsmouth R.R.	1	53.50	40—2⅜
Great Northern Ry.	2	255.00	73—9
Illinois Traction System	6	80.00	......
Toledo & Western Ry.	1	60.00	37—4
Extraterritorial			
Havana Central R.R.	1	60.00	37—4
Canada			
Canadian National Ry.	1	68.00	......
Total	60		

In addition to this table, the trend of purchases is shown by graphs. Three of these on one diagram show the new cars ordered each year beginning with 1907. One gives the total number of cars and electric locomotives, the second gives passenger cars for city service and the third interurban cars for passenger service. The number of passenger cars bought for city service decreased from 1923 to 1925. The number for 1926 with a total of 1,249 is lower than any other years except 1921 and 1925. Purchases of interurban cars increased from 1921 to 1924. Since then the number has decreased, there being but 320 reported in 1925 and but 309 in 1926.

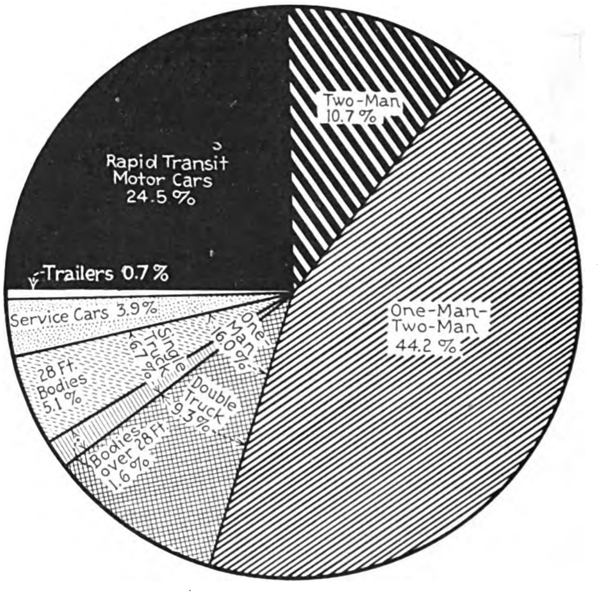
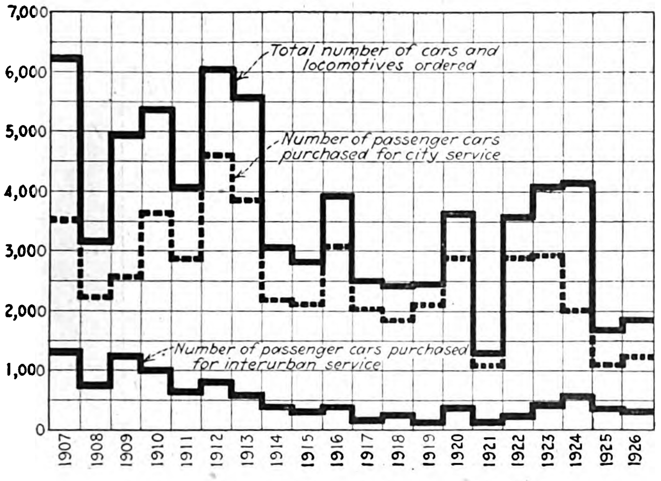


Diagram Showing the Proportion of Total City Cars for Each Type Purchased in 1926

A special comparison of cars ordered during the past eleven years is given in Table II. Cars are listed separately for city and interurban service and each class divides the various cars according to type. It is interesting to note how the number of safety cars purchased has increased each year from 1916 up to and including 1920 and during the same period how the number of large two-man cars has decreased. One-man, two-man cars first made their appearance in 1922 and since that time this type of car has proved most popular for city service. These changes in types of cars ordered have been discussed in connection with the several classifications.

In Table V a recapitulation is given by districts of cars ordered during 1926. This shows that the greatest purchases of rolling stock were in the Eastern and Central States, while the Western States purchased comparatively few. The purchases during 1926 classified by districts follow in the same order as for the year 1925. During 1924 the Western States showed the greatest number of cars purchased, there being eighteen companies in the Western States that reported a total of 1,663 cars and locomotives bought for city and interurban service. This is nearly as many as the total number reported for 1926, in all states. Car purchases during 1926, arranged by districts in the order of the number bought, show 669 cars purchased for city and interurban service in the Eastern States, 524 cars in the Central States, 224 cars in the Southern States, 180 in the New England States and 108 cars in the Western States. The Dominion of Canada reported a total of 111 cars, all for city service.

By analyzing the various one-man, two-man cars ordered for city service during 1926, it is seen that they run quite uniform in length, weight and seating capacity. Length varies from 37 ft. 6 in. to 46 ft. 2 in. and weight from 12.35 tons to 19.50 tons. In analyzing the essential details of cars of this class, the 100 multiple-unit cars ordered by the Chicago Surface Lines have not been included, since these are primarily for heavy city train service. For that reason they are larger and of heavier capacity than the ordinary one-man, two-man car required for city service. Consequently it is considered that these cars do not represent what can properly be described as a one-man, two-man car in size and weight. The weighted average for all cars of the one-man, two-man type purchased during 1926, exclusive of the Chicago cars, gives a length of 43 ft. 5 in. and a weight of 17.36 tons.



Graphical Analysis of Total Cars and Locomotives and Passenger Cars for City and Interurban Purchased During Past Twenty Years

It is interesting to compare these average dimensions with similar ones for the city cars as proposed by the A.E.R.A. committee on essential features of modern cars, published in ELECTRIC RAILWAY JOURNAL for June 26, 1926. This committee gave three sizes of one-man, two-man double-end city cars, identical except for the number of windows included in the body. The ten-window body has a length over bumpers of 39 ft. 7½ in., the eleven-window body a length of 42 ft. 1 in. and the twelve-window body a length of 44 ft. 6½ in. The weighted average of length for cars purchased during 1926, 43 ft. 5 in., falls between that of the eleven and twelve-window cars, which would seem to indicate that cars of these two sizes would meet most conditions. Of the cars reported in the 1926 statistics, there was but one order for cars of a length shorter than the shortest car proposed by the A.E.R.A. committee. This was for 13 cars purchased by the Southern Indiana Gas & Electric Company, the length of these cars being 37 ft. 6 in. and weight 12.35 tons. Of cars longer than the 44 ft. 6½ in. recommended for the longest car by the A.E.R.A. committee, there were fourteen cars purchased which were 45 ft. long; 73 cars which were 45 ft. 4 in. long; two cars which were 45 ft. 8 in. long; 30 cars which were 45 ft. 9 in. long; 32 cars which were 46 ft. 2 in., and ten cars which were 47 ft. long.

Table V—Recapitulation by Districts of Cars Ordered During 1926

	New England States	Eastern States	Central States	Southern States	Western States	Extraterritorial	Total for United States	Total for Canada	Grand Total
Number of companies reporting purchase of new cars...	12	33	35	14	7	1	102	6	108
City Service									
One-man cars, 28-ft. body....	...	9	16	36	...	..	61	5	66
One-man cars, with bodies longer than 28 ft.									
Single truck............	...	10	...	13	...	..	23	...	23
Double truck............	...	46	60	15	...	..	121	...	121
One-man, two-man cars.....	10	138	164	148	40	..	500	74	574
Two-man cars (surface).....	...	62	1	...	46	6	115	24	139
Motor cars for rapid transit lines....................	100	217	...	...	...	..	317	...	317
Trailers..................	...	...	...	...	5	..	5	4	9
Service and miscellaneous cars	15	21	7	2	3	..	48	4	52
Total cars, city service....	125	503	248	214	94	6	1,190	111	1,301
Interurban Service									
One-man, single truck cars..	...	4	...	...	...	..	4	...	4
One-man, double-truck cars.	...	4	35	...	...	..	39	...	39
One-man, two-man cars.....	22	5	8	10	...	..	45	...	45
Two-man cars.............	6	30	40	...	4	..	80	...	80
Trailers..................	15	30	4	...	...	..	49	...	49
Motor cars for train service..	12	80	...	...	...	..	92	...	92
Express and freight cars.....	...	8	187	...	...	..	195	...	195
Miscellaneous cars..........	...	5	2	...	10	..	17	...	17
Total cars interurban service	55	166	276	10	14	..	521	...	521
Electric locomotives........	8	34	16	...	...	1	59	1	60
Total cars and electric locomotives...............	188	703	540	224	108	7	1,770	112	1,882

In regard to weight, the weighted average for the cars purchased during 1926 is 17.36 tons, which also falls within the weights given for the eleven and twelve-window cars. The recommended weights are respectively 15.6 tons and 18.5 tons. Corresponding weighted averages for cars of the one-man, two-man class purchased during the year 1925 were given in the Jan. 2, 1926, issue of ELECTRIC RAILWAY JOURNAL, the length being 44 ft. 1 in. and weight 18.07 tons. It thus appears that the tendency during 1926 was to use a car for one-man, two-man service slightly smaller in size than those purchased during 1925.

In general design cars of this class have remained about the same for the last three years. Wheels of 26 in. diameter are used most commonly, and platforms are either at the level of the car floor or with a slight ramp. A single intermediate step is used between the roadway and the car platform. Arch-type roof construction is used most generally. All of these charac-

Table VI—Freight Cars Ordered During 1926

Name of Railway	Number
Cincinnati, Hamilton & Dayton Ry................	40
Northern Ohio Power & Light Co..................	27
Lake Shore Electric Ry..........................	20
Union Traction Company of Indiana...............	20
Indiana, Columbus & Eastern Traction Co.........	15
Michigan R.R....................................	15
Brooklyn-Manhattan Transit Corp.................	12
Pennsylvania-Ohio Electric Co...................	10
Toledo, Bowling Green & Southern Traction Co....	10
Toledo, Fostoria & Findlay Ry...................	10
Western Ohio Ry.................................	10
Cleveland Southwestern Railway & Light Co.......	5
West Penn. Rys..................................	3
Indiana Service Corp............................	1
Total...	198

Table VII—Details of Rolling Stock Ordered During 1926

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
New England States											
Connecticut											
Connecticut Co.	1	Crane	Construct.	Motor	Double	42— 0	32.70	4			28 CSM 20 CDM
New York, New Haven & Hartford R.R.	12	Passenger	Interurban	Motor	Double	80— 1¼	88.00	4	120	Train	
	15	Passenger	Interurban	Trailer	Double	80— 1¼	51.80		120	Train	
Maine											
Bangor Hydro-Electric Co.											1 IDM
Massachusetts											
Berkshire Street Ry.	12	Passenger	Interurban	Motor	Double	48—10	18.60	4	50	Both	
Boston Elevated Ry.	100	Passenger	City	Motor	Double	46— 7½	34.50	2	48	Train	42 CP 12 IS
	9	Work	Construct.	Motor	Double	40— 0	23.00	4			
	4	Sweeper	City	Motor	Double	39— 0	26.00	4			
East Taunton Street Ry.	2	Passenger	Interurban	Motor	Double	36—10	13.96	4	44	Both	1 IP
Eastern Massachusetts Street Ry.	1	Snow Plow	Both	Motor	Double	43— 0	25.00				92 CDM 27 CSM 22IDM
Fitchburg & Leominster Street Ry.	4	Passenger	Interurban	Motor	Double	36—10	20.00	4	40	Both	
Gardner-Templeton Street Ry.											14 CM
Greenfield-Montague Transp. Area	2	Passenger	Interurban	Motor	Double	39— 1¼		4	44	Both	
Interstate Street Ry.	2	Passenger	Interurban	Motor	Double	40— 3	16.10	4	44	Both	
Plymouth & Brockton Street Ry.											6 CDM
Springfield Street Ry.											1 CSM 2 CDM
Rhode Island											
United Electric Rys.	10	Passenger	City	Motor	Double	41— 0	15.50	4	38	Both	
Vermont											
Springfield Terminal Ry.	2	Passenger	Interurban	Motor	Double	41— 6	18.00	4	48	Two	2 CP
Vergennes Power Co.	4	Passenger	Interurban	Motor	Double	45— 0	15.00	4	48	Two	4 CSM
Total cars New England States	180										
Eastern States											
District of Columbia											
Capital Traction Co.											115 CST 6 CSM
Washington Railway & Electric Co.	15	Passenger	City	Motor	Double	42—3	20.10	4	49	One	25 CDM
	1	Work	Both	Motor	Double	42—11	20.00	4			
Washington-Virginia Ry.											6 IDM 5 IDT
Maryland											
Potomac Edison Co.	2	Passenger	City	Motor	Double	40— 0	15.92	4	38	Both	
	1	Passenger	City	Motor	Single	28— 0½	8.83	2	32	One	
United Railways & Electric Co	12	Passenger	City	Motor	*Three	74—10	33.80	4	87	Two	35 CSM
Washington, Baltimore & Annapolis Elec. R.R.	10	Passenger	Interurban	Motor	*Three	94— 7	59.00	4	94	Two	
New Jersey											
Coast Cities Ry.											8 CDM 42 CSDO
Cumberland Traction Co.	2	Passenger	Interurban	Motor	Double	48— 0	20.00	4	44	One	
Trenton & Mercer County Traction Corp.	3	Sweepers	City	Motor	Double			4			
New York											
Batavia Traction Co.	1	Passenger	City	Motor	Double			2	42	One	
Brooklyn City R.R.	1	Crane	Construct	Motor	Double	44—0	33.50	4			
Brooklyn-Manhattan Transit Corp.	67*	Passenger	City	Motor	*Four	137—0		4	160	Two	
	12	Freight	City	Trailer							71 CM
	1	Supply	City	Motor	Double	48—0	30.00	4			
Chautauqua Traction Co.											11 CDM
Eastern New York Utilities Corp.	2	Passenger	Interurban	Motor	Double	41—3	19.00	4	44	Both	
Ithaca Traction Corp.	4	Passenger	City	Motor	Single	29— 8½		2	32	Both	
Jamestown Street Ry.	8	Passenger	City	Motor	Single	27— 7	9.50	2	30	One	
Long Island R.R.	60	Passenger	Interurban	Motor	Double		57.35	2	78	Train	
	30	Passenger	Interurban	Trailer	Double		35.00		80	Train	
	5	Caboose	Interurban	Trailer			19.00				
New York & Stamford Ry.											24 IDM
New York State Rys.	1	Dump	Construct	Motor	Double	40--0	25.00	4			
	1	Dump	Construct	Trailer	Double	40— 0	17.00				
New York, Westchester & Boston Ry.	20	Passenger	Interurban	Motor	Double	72— 06	63.45	2	80	Two	
Olean, Bradford & Salamanca Ry											1 IDM
Richmond Light & R.R. Co.											30 CDM
Schenectady Ry.	2	Work	City	Motor	Double	40— 0	25.00	4			
Pennsylvania											
Conestoga Traction Co.	6	Passenger	City	Motor	Single	31— 0	9.00	2	30	One	
East Taunton Street Rwy.	2	Passenger	Interurban	Motor	Double	38— 0	14.00	4	40	One	
Jefferson Traction Co.											1 C 2 I
Pennsylvania R.R.	20	Passenger	Interurban	Motor	Double	64— 0	61.50	2	72	Train	
Philadelphia Rapid Transit Co.	150	Passenger	City	Motor	Double			2		Train	50 CDM
	50	Passenger	City	Motor	Double	45— 6	18.47	4	48	Two	
Pittsburgh Rys.	50	Passenger	City	Motor	Double	45— 4	19.00	4	52	Both	
Reading Transit Co.	4	Passenger	City	Motor	Double	45— 0	16.85	4	46	Both	
Scranton Ry.	12	Passenger	City	Motor	Double	41—10	18.00	4	44	Both	55 CSM 2 CDM
Sunbury & Selinsgrove Ry.	3	Passenger	Both	Motor	Double	40— 3	14.00	4	50	Both	3 CM
Tarentum, Breckenridge & Butler Street Ry.	4	Passenger	Interurban	Motor	Single			2	28	One	3 ISM
United Traction Street Ry.											4 IM
West Penn Rys.	3	Freight	Interurban	Motor	Double	50— 0	21.00	4			
	1	Flat car	Interurban	Trailer	Single	20— 0	4.00				20 CSM
	2	Line cars	Interurban	Motor	Double	45— 0	21.00	4			
Westside Electric Street Ry.	3	Passenger	City	Motor	Double	41— 2	17.53	4	46	Both	
Williamsport Passenger Ry.	5	Passenger	City	Motor	Double	42— 2	16.00	4	44	Both	
	1	Snow plow	Both	Motor	Single	28— 0		2			
Wilkes-Barre Ry.	10	Passenger	City	Motor	Double	45— 0		4		Both	
Virginia											
Roanoke Ry. & Electric Co.	6	Passenger	City	Motor	Double	41— 4	17.50	4	44	Both	
Virginia Electric & Power Co.	30	Passenger	City	Motor	Double	40— 0	16.00	4	44	One	74 CSM
West Virginia											
Ohio Valley Electric Ry.	46	Passenger	City	Motor	Double	44— 0	18.00	4	48	Both	
Total cars Eastern States	669										

*Three-section units.

Table VII—Details of Rolling Stock Ordered During 1926—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Central States											
Illinois											
Aurora, Elgin & Fox River Electric Co.	8	Passenger	City	Motor	Single	28— 0½	9.03	2	32	One	
Chicago, North Shore & Milwaukee R.R.	4	Caboose	Interurban	Trailer	Double	34—10	27.00				2 IF 1 IP
Chicago Surface Lines	100	Passenger	City	Motor	Double	48—11	20.65	2	51	Both	
Chicago & Joliet Electric Ry.	4	Passenger	Interurban	Motor	Double	46— 2	19.25	4	48	One	
	6	Passenger	Interurban	Motor	Double	46— 2	19.25	4	52	One	
Illinois Power Co.											4 CSM
Illinois Power & Light Corp.											61 CP
Indiana											
Chicago, South Shore & South Bend R.R.	25	Passenger	Interurban	Motor	Double	60— 0	57.00	4	42	Two	
	2	Parlor	Interurban	Trailer	Double	60— 0					
	2	Dining	Interurban	Trailer	Double	60— 0					
Gary Railways	12	Passenger	Interurban	Motor	Double	44— 0	28.75	4	44	One	
Gary & Hobart Traction Co.	3	Passenger	Interurban	Motor	Double	44— 8½	21.25	4	44	Two	
Indiana Service Corp.	1	Freight	Interurban	Motor	Double	52— 0	32.00	4			
	1	Work	Interurban	Trailer	Double	52— 0	18.00				
Southern Indiana Gas & Electric Co.	4	Passenger	Interurban	Motor	Double	40— 3	17.00	4	44	One	
	13	Passenger	City	Motor	Double	37— 6	12.35	4	44	Both	
Union Traction Company of Indiana	20	Freight	Interurban	Trailer	Double	49— 8	21.25				
Kentucky											
Kentucky Traction & Terminal Co.	1	Passenger	Interurban	Motor	Double	40— 3	14.00	4	44	One	
Louisville Ry											13 CDM 3 CST
Michigan											
Department of Street Rys. (Detroit)											14 CDM
Detroit United Ry.											1 CDM 1 F 1 IDM
Grand Rapids Ry.											6 CDM
Menominee & Marinette Light & Traction Co.											1 CSM
Michigan R.R.	15	Freight	Interurban	Trailer	Double	49— 8	21.50				
Muskegon Traction & Light Co.	2	Passenger	City	Motor	Double		16.50	4		One	
Minnesota											
Mesaba Ry.											2 IDM
Twin City Rapid Transit Co.	1	Crane	Construct	Motor	Double	44— 0	35.00	4			
Missouri											
City Light & Traction Co.											1 CP
Missouri Power & Light Co.											1 CP
St. Joseph Light, Heat & Power Co.											36 CM
United Rys. (St. Louis)											18 CDM
Ohio											
Cincinnati, Hamilton & Dayton Ry.	6	Passenger	City	Motor	Single	28— 1½	8.00	2	32	One	
	10	Passenger	City	Motor	Double	39— 8	14.75	4	47	Both	
	7	Passenger	Interurban	Motor	Double	53— 9	28.75	4	50	Two	
	3	Passenger	Interurban	Motor	Double	52— 2	30.00	4	52	Two	
	40	Freight	Interurban	Trailer	Double	49— 8	21.20				
Cincinnati Street Ry.	5	Passenger	City	Motor	Double	39— 8	13.25	4	49	One	23 CSM
Cleveland Ry.	1	Passenger	City	Motor	Double	51— 2	16.40	4	56	Two	59 CDM
	1	Concrete Breaker	City	Motor	Single	24— 0	10.00	1			
Cleveland Southwestern Ry. & Light Co.	5	Freight	Interurban	Trailer	Double	54— 3	40.00				
Columbus, Delaware & Marion Electric Co.	2	Parlor	Interurban	Motor	Double	62— 0	47.50	4	36	Two	
Columbus Railway, Power & Light Co.	23	Passenger	City	Motor	Double	45— 3¾	18.31	4	48	Both	
Columbus, Urbana & Western Electric Ry.											3 I
Indiana, Columbus & Eastern Traction Co.	15	Freight	Interurban	Trailer	Double	36— 0	21.20				
Lake Shore Electric Ry.	20	Freight	Interurban	Trailer	Double	36— 0	21.20				
Nelsonville Electric Ry.											1 IDM
Northern Ohio Power & Light Co.	1	Dump	Construct	Trailer	Double	40— 0	25.00				30 CDM
	25	Freight	Interurban	Trailer	Double	49— 8	21.50				
	2	Freight	Interurban	Motor	Double	52— 4	35.75				
Pennsylvania-Ohio Electric Co.	10	Freight	Interurban	Trailer	Double	49— 8	21.20				12 IDM
	13	Passenger	City	Motor	Double	49— 0	16.06	4	44	One	
Portsmouth Public Service Co.	3	Passenger	City	Motor	Double	42—11	13.40	4	55	Both	
Stark Electric R.R.	8	Passenger	Interurban	Motor	Double	47— 0	16.00	4	54	One	5 IDM
Steubenville, East Liverpool & Beaver Valley Traction Co.	8	Passenger	Interurban	Motor	Double	48— 0	23.00	4	51	Both	
Toledo, Bowling Green & Southern Traction Co.	10	Freight	Interurban	Trailer	Double	49— 8	21.20				
Toledo Edison Co.	1	Dump	Construct	Trailer	Double	40— 0	17.00				
Toledo, Fostoria & Findlay Ry.	10	Freight	Interurban	Trailer	Double	36— 0	21.20				
Western Ohio Ry.	10	Freight	Interurban	Trailer	Double	49— 8	21.50				
Youngstown Municipal Ry.	13	Passenger	City	Motor	Double	49— 0	16.06	4	44	Both	
Wisconsin											
Milwaukee Electric Railway & Light Co.	40	Passenger	City	Motor	Double	45— 0	17.88	4	54	One	1 CDM
	4	Sweepers	City	Motor	Double	46— 0	36.00	4			
Mississippi Valley Public Service Co.	2	Passenger	City	Motor	Single		8.50	2		One	
Northern States Power Co.											5 CST 1 CDM 2 IDM
Wisconsin Power & Light Co.											3 IDM 1 CDF
Wisconsin Valley Electric Co.	2	Passenger	City	Motor	Double	43— 6	17.00	4	52	Both	1 CDM
Total cars Central States	524										
Southern States											
Alabama											
Alabama Power Co.	3	Passenger	City	Motor	Double	42—10	16.25	4	53	One	16 CM
Birmingham Electric Co.	16	Passenger	City	Motor	Double	49— 7	18.00	4	62	Both	13 CDM
	1	Work	City	Motor	Single	16— 4	14.00	2			
Mobile Light & Railroad Co.	7	Passenger	City	Motor	Single	29— 9	8.75	2	32	One	2 CDM
Arkansas											
Arkansas Power & Light Co.	30	Passenger	City	Motor	Single	28— 6½	9.00	2	33	One	
Fort Smith Light & Traction Co.	6	Passenger	City	Motor	Single	28— 0½	8.00	2	32	One	
Florida											
Key West Electric Co.											9 CSM
Miami Beach Ry.	12	Passenger	City	Motor	Double	45— 9	18.00	4	48	One	
Municipal Ry. of St. Petersburg	8	Passenger	City	Motor	Double	40— 1	15.22	4	46	Both	1 CDMO
Tampa Electric Co.	10	Passenger	City	Motor	Double	47— 0		4	48	Both	

Table VII—Details of Rolling Stock Ordered During 1926—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Georgia											
Georgia Railway & Power Co.	60	Passenger	City	Motor	Double	46— 4	18.69	4	48	Both	60 CST
	10	Passenger	City	Motor	Double	45— 6	18.12	4	52	Both	.. 34 CDT .. 3 IDT
Louisiana											
Shreveport Rys.	2	Passenger	City	Motor	Double	45— 8	17.00	4	52	Both	1 CSM
Mississippi											
Mississippi Power Co., Gulfport	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11 IDM
North Carolina											
Carolina Power & Light Co.	6	Passenger	City	Motor	Single	33— 0	11.00	2	40	One	13 CSM
Tidewater Power Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 CDM
Tennessee											
Memphis Street Ry.	32	Passenger	City	Motor	Double	46— 2	19.00	4	56	Both	.....
Nashville Railway & Light Co.	10	Passenger	City	Motor	Double	40— 0	14.50	4	44	Both	.....
	1	Work	Construc.	Motor	Double	40— 6	22.50	4	..	.....	.....
Tennessee Electric Power Co.	10	Passenger	City	Motor	Double	40— 3	13.75	4	44	Both	10 CDM
Total cars Southern States	224										
Western States											
Arizona											
Tucson Rapid Transit Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 CDM
California											
Bakersfield & Kern Electric Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 CP
Key System Transit Co.	6	Dump	Construct.	Trailer	Double	42— 0	18.95	.....	.....	.....	10 CDM
	4	Dump	Construct.	Motor	Double	41— 0	27.00	4	.....	.....	.....
Market Street Ry.	29	Passenger	City	Motor	Double	47— 0	19.55	4	50	Two	24 CDM
	2	Passenger	City	Cable	Double	31— 5	6.35	.....	36	Two	.....
Municipal Ry. of San Francisco	15	Passenger	City	Motor	Double	47— 1	25.00	4	52	Two	.....
Pacific Electric Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22 IPM 19 IS 51 IF
Colorado											
Colorado Springs & Interurban Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 CSM
Denver Tramway Corp	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CDM
Denver & South Platte Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 CSM
Nebraska											
Lincoln Traction Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20 CSM 2 CDM
Texas											
Dallas Railway & Terminal Co.	30	Passenger	City	Motor	Double	45— 8¾	19.50	4	52	Both	.....
	2	Dump	Construct.	Motor	Double	40— 0	22.68	4	.....	.....	.....
Eastern Texas Electric Co.	4	Passenger	Interurban	Motor	Double	44— 4	.....	4	42	Two	5 CDM
El Paso Electric Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 CSM
Houston Electric Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 CDM
San Antonio Public Service Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
Utah											
Utah Light & Traction Co.	10	Passenger	City	Motor	Double	40— 1	16.00	4	40	Both	7 CDM
	5	Passenger	City	Trailer	Double	40— 0	7.50	.....	56	One	.....
Washington											
Puget Sound Power & Light Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 IF
Spokane United Rys.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36 CDM
Yakima Valley Transportation Co.	1	Service	City	Motor	Single	.....	.....	.....	.....	.....	.....
Total cars Western States	108										
Extraterritorial											
Porto Rico											
Porto Rico Ry., Light & Power Co.	6	Passenger	City	Motor	Double	45— 6	14.00	4	65	Two	.....
Total cars Extraterritorial	6										
Dominion of Canada											
British Columbia											
British Columbia Electric Ry	8	Passenger	City	Motor	Double	48— 8	22.45	4	48	Two	3 CDM
	4	Passenger	City	Motor	Double	48— 8	23.15	4	48	Two	2 CSM
	4	Passenger	City	Trailer	Double	48— 8	23.70	.....	55	One	1 IDF
Nova Scotia											
Nova Scotia Tramways & Power Co.	4	Passenger	City	Motor	Single	28— 0½	9.25	2	32	One	19 CSM
Ontario											
Hamilton Street Ry.	24	Passenger	City	Motor	Double	40—11	17.00	4	48	Both	16 CSM
Niagara, St. Catharines & Toronto Ry.	12	Passenger	City	Motor	Double	42— 6	16.39	4	44	Two	.....
Oshawa Ry.	1	Work	.....	.....	.....	.....	.....	.....	.....	.....	1 C
Quebec											
Montreal Tramways	50	Passenger	City	Motor	Double	41— 2	17.00	4	40	Both	.....
Newfoundland											
Newfoundland Light, Heat & Power Co.	1	Passenger	City	Motor	Single	28— 0½	11.00	2	30	One	.....
	3	Sweeper	City	Motor	Single	28— 0	15.00	.....	.....	.....	6 CM
Total cars Canada	111										

C—city cars
CS—city, single truck
CD—city, double truck
CSM—city, single truck, motor
CST—city, single trunk, trailer
CSO—city, single truck, open
CDM—city, double truck, motor
CDT—city, double truck, trailer

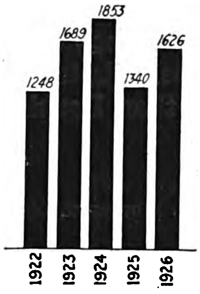
CDMO—city, double truck, motor, open
CP—city passenger cars
CM—city motor cars
CDF—city, double truck, flat cars
I—interurban cars
IS—interurban service

ID—interurban, double truck
IDM—interurban double truck, motor
ISM—interurban, single truck, motor
IT—interurban trailer
IP—interurban passenger
IM—interurban motor

IDT—interurban, double truck, trailer
IDF—interurban, double truck, freight
IF—interurban freight
F—freight
PM—passenger motor
S—service cars

teristics agree with those proposed by the A.E.R.A. committee.

The statistics in these tables do not give information of car characteristics such as would show the attention devoted to providing a more pleasing appearance and greater comfort and convenience for passengers. Conclusions can, however, be reached from the large number of descriptive articles which have been published from time to time in ELECTRIC RAILWAY JOURNAL of cars as they were purchased during the year. From these articles it is apparent that car appearance has been given great attention and that the cars now being ordered by the railways and furnished by the manufacturers are of a more attractive design than have ever been produced before.

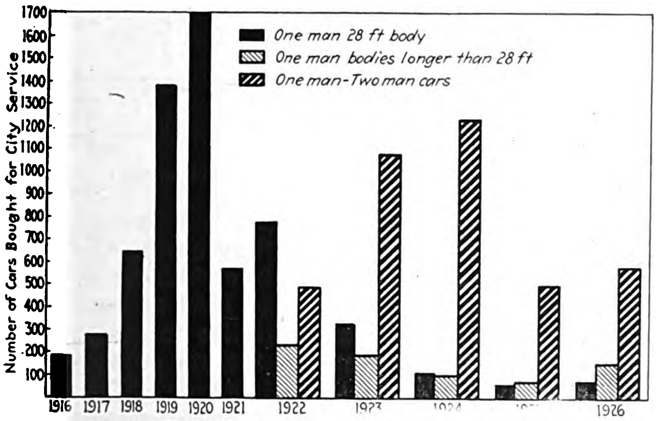


Number of Cars Reported as Junked During Last Five Years

The last column of Table VII is devoted to cars junked during the year. During 1926 a total of 1,626 cars were reported by electric railways as being junked. By grouping these into classes it is found that a total of 1,402 city passenger cars, 135 interurban passenger cars and 89 miscellaneous service, work and freight cars were reported as being junked. It is interesting to note that this shows that the 1,402 city passenger cars junked during 1926 exceeded the 1,249 new passenger cars purchased. This is the first time since this paper has given analyses of the cars junked that this condition has been shown.

An accompanying diagram shows graphically the number of cars junked during the past five years. Comparison of the figures shown in this diagram indicates that the number of cars junked during 1926 was approximately the same as in 1923 and was exceeded only by those junked during the year 1924, when 1,853 cars were reported. The purchase of new cars, however, during 1924 was more than double that for 1926.

The information which has been assembled and is given in the accompanying tables of rolling stock was obtained from replies received to questionnaires addressed to all electric railways in the United States and Canada. Through the courtesy and co-operation of the various car manufacturers, lists of cars built by them during the year were furnished so that the replies received from railways could be checked very carefully. In a few cases where replies have not been received from electric railways themselves, information furnished by the car manufacturers has been used. Replies were received from all car manufacturers. Information from these two sources has been amplified by checking through the files of rolling stock which are kept by ELECTRIC RAILWAY JOURNAL and which include cars purchased and contemplated purchases. Particular care has been used to obtain accurate information from railways which might purchase cars at a late date, so it is felt that this year's information is particularly complete. Details of individual purchases of rolling stock during 1926 follow on pages 25-27.



Graph Showing Relative Purchases of One-Man and One-Man, Two-Man Cars for Eleven Years

Standardization Developments in 1926

NOTABLE developments in the standardization movement, important progress in industrial safety, further extension through managerial and trade association activities and forward steps in international co-operation have been achieved during 1926, according to an announcement of the American Engineering Standards Committee. Standardization was also the subject of a special report at the recent conference of the Premiers of the British Empire.

Instead of leaving standardization work as a more or less incidental function of the engineering and production departments, industrial executives are providing a definite organization for their standardization work. This was well illustrated during "management week," when scores of meetings of industrialists and chambers of commerce, held all over the country, were devoted to the consideration of the standardization and simplification problems which are met by the works manager and his associates.

The systematic organization of company standardization work is leading to a much larger degree of cooperation between companies. For example, in the Cleveland industrial district the men in charge of this work for a large group of important companies have organized for mutual assistance in the work. Through this more than 30 Cleveland firms have reorganized their screw thread practice in accordance with the revised national standard, and more than a dozen firms have systematized their entire control of interchangeable manufacture through the introduction of the new national standard of limit gaging.

In April there were held in New York the most important group of international conferences on standardization ever assembled. Of these, the two principal features were the meeting of the International Electrotechnical Commission with its group of technical committees and the Third Conference of the National Standardizing Bodies, in connection with which there were international technical conferences on screw threads, ball bearings, gages and preferred numbers. In each of these technical conferences real progress was made toward bringing about international uniformity in industrial practice in the different countries. Twenty countries from Europe, Asia and South America were officially represented.

During the conferences a basis was laid for what it is hoped will soon become a unified international standardizing body covering the general field of industrial standardization. In September committees of the two groups met in London, at which time further steps were taken. Final agreement upon a unified plan has not yet been consummated, there naturally being difficulties inherent in a problem involving a group of national as well as international organizations.

Electric Railway Costs and Fares in 1926

While Prices of Wholesale Commodities, Electric Railway Operating Materials and Car Fares Have Been Stabilized at About 150 per Cent of Pre-War Figures, Electric Railway Wages and Construction Costs Are More than Double the 1913 Level

By Albert S. Richey
Electric Railway Engineer, Worcester, Mass.

FOR the past several years, in its Financial and Corporate section, monthly, ELECTRIC RAILWAY JOURNAL has been presenting a series of index numbers compiled by the author under the heading "Conspectus of Indexes." This conspectus comprises indexes showing the trend of street railway fares and the costs of electric railway wages and materials entering into electric railway operation; costs of construction, both electric railway and general; wholesale commodities in general; retail food; cost of living, and some others. In the Annual Statistical Numbers of the JOURNAL—the first issue in January in 1923, 1924, 1925 and 1926—there have been shown charts and tables depicting the trend since 1914 of the more important of these indexes as affecting electric railway operation. In Fig. 4 herewith is shown a similar chart indicating the trend of five of these indexes from January, 1914, through the latest available figures for 1926. The indexes there shown are: (1) Wholesale prices of all commodities, as computed by the U. S. Bureau of Labor Statistics; (2) Electric Railway Construction Costs, as computed by the formula of the American Electric Railway Association; (3) Electric Railway Operating Materials Costs, including fuel for power; (4) Electric Railway Wages; (5) Street Railway Fares.

The methods used in the computation of these five indexes were described fully in the statistical issue of the JOURNAL for Jan. 2, 1926, which issue also contained a tabulation showing the numerical values of the various indexes monthly from January, 1920, through December, 1925. The numerical values monthly from January, 1914, through December, 1919, may be found in the JOURNAL for Jan. 5, 1924. A tabulation herewith shows the numerical value of six of the indexes monthly from January, 1924, to date, and these six indexes are also shown graphically on a somewhat larger scale than Fig. 4 by the charts Figs. 1 to 3 and 5 to 7, inclusive.

As shown by Fig. 1, the average street railway fare has increased slightly during 1926 from 7.32 cents in January to 7.42 cents in December. The change is due principally to increases in the eastern Massachusetts cities and Cleveland, and in a lesser degree to increases in Oakland, Des Moines, Spokane, Louisville, Salt Lake City, Duluth and Norfolk. A number of other increases have been of less consequence in affecting the index, either on account of small amount or the relatively small population involved. During the year only one decrease was noted as affecting the index, this being at Tacoma.

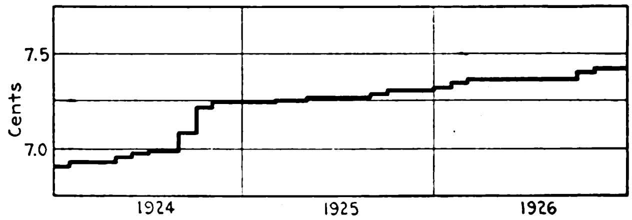


Fig. 1—Street Railway Fares (1923 = 4.8425 Cents

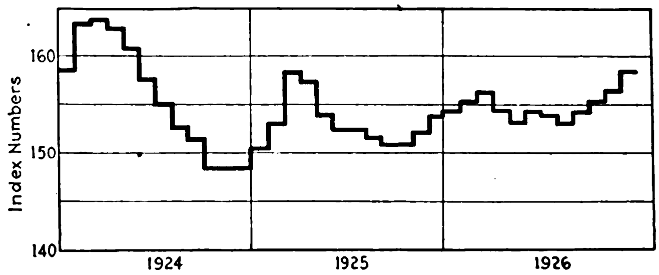


Fig. 2—Electric Railway Operating Materials (1913 = 100)

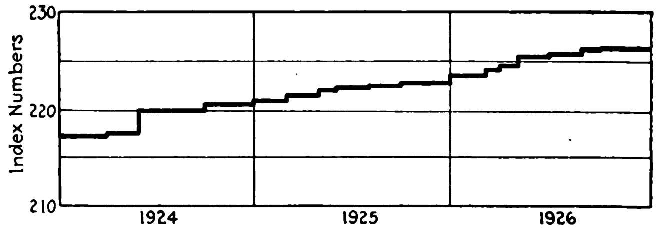


Fig. 3—Electric Railway Wages (1913 = 100)

The trend of the cost of electric railway operating materials has fluctuated only slightly during the year, as shown by Fig. 2, and seems to be stabilizing at about 155 as compared with its pre-war level of 100. The factor which was particularly effective in causing the fluctuations during the year was fuel for power, which enters into this index with the weighting of 40 per cent. Other factors entering maintain prices considerably more uniform than did fuel for power. Nevertheless, as indicated by Fig. 2, the fluctuations in this index were much less marked during 1926 than in either of the two preceding years.

The average wage of electric railway motormen and conductors maintained the upward trend which has been in evidence since the middle of 1923, as shown by Fig. 3. During 1926 eight companies were dropped from this index on account of reduction of forces and one company added, so that the index now

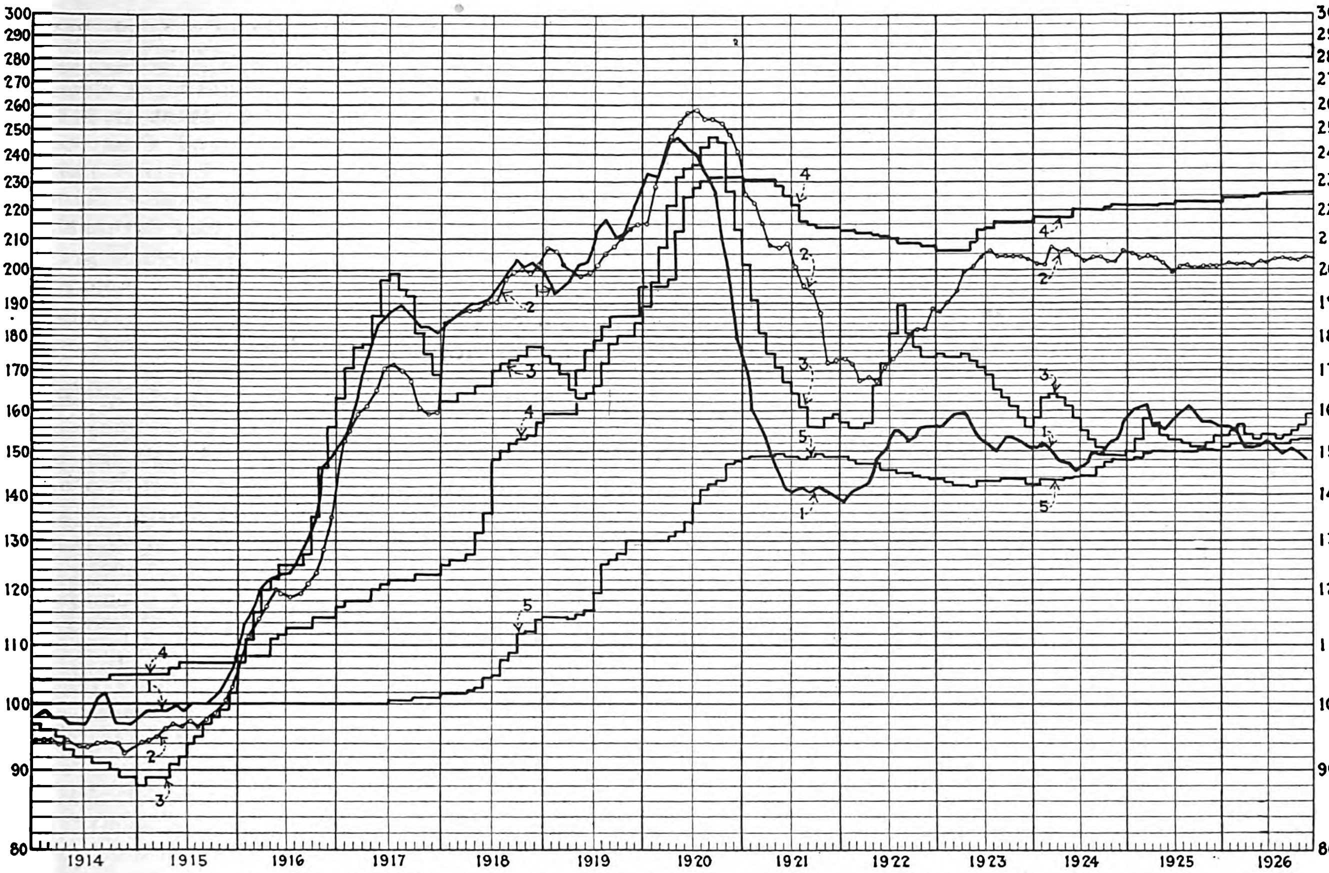


Fig. 4—Trend of Construction Costs, Wages and Fares, 1913-1926 (1913 = 100)

1. Wholesale prices all commodities (U. S. Bureau of Labor Statistics).

2. Electric railway construction costs (American Electric Railway Association statistics).

3. Electric railway operating materials costs (Richey). Includes fuel for power and weighted according to average use in maintenance and operation.

4. Electric railway wages (Richey). Maximum hourly wages of platform men, weighted according to number of men.

5. Street railway fares (Richey). U. S. cities (except New York) weighted according to population.

	Street Railway Fares (Richey)	Elec. Ry. Operating Materials Costs (Richey)	Electric Railway Wages (Richey)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	General Construction Costs (*Eng.News-Record*)	Wholesale Prices, All Commodities (U.S. Bur. Lab. Stat.)
1913 aver...	100.0	100.0	100.0	100.0	100.0	100.0
1914 aver...	100.0	92.6	104.2	94.0	88.6	98.1
1915 aver...	100.1	93.5	106.2	97.3	92.6	100.8
1916 aver...	100.1	126.2	111.6	119.8	129.6	126.8
1917 aver...	100.5	181.9	120.6	162.7	181.2	177.2
1918 aver...	106.2	168.8	140.5	192.5	189.2	194.3
1919 aver...	120.7	172.2	174.0	205.1	198.4	206.4
1920 aver...	137.2	224.6	217.3	244.7	251.3	226.2
1921 aver...	148.9	169.9	222.7	200.7	201.8	146.9
1922 aver...	146.0	170.0	210.0	175.2	174.4	148.8
1923 aver...	142.9	168.0	212.1	200.2	214.1	153.7
1924						
January....	142.6	158.5	217.4	203.0	217.9	151.2
February...	143.1	163.2	217.4	203.8	220.3	151.7
March.....	143.1	163.9	217.5	206.8	224.7	149.9
April.......	143.2	162.8	217.7	205.5	221.6	148.4
May.......	143.5	160.8	217.8	206.7	222.4	146.9
June.......	143.8	157.6	220.0	204.8	216.8	144.6
July.......	144.2	154.9	220.0	203.7	214.4	147.0
August.....	144.3	152.6	220.0	204.3	213.1	149.7
September..	146.2	151.4	220.1	204.3	211.2	148.8
October....	149.1	148.5	220.6	203.2	207.5	151.9
November..	149.5	148.6	220.7	203.7	205.7	152.7
December..	149.6	148.7	220.8	205.6	208.6	157.0
1925						
January....	149.6	150.3	221.0	205.3	210.4	160.0
February...	149.6	153.1	221.0	203.9	209.7	160.6
March.....	149.9	158.4	221.5	204.4	210.2	161.0
April.......	150.0	157.3	221.6	204.1	209.5	156.2
May.......	150.0	153.9	222.2	202.0	207.2	155.2
June.......	150.0	152.4	222.4	200.0	204.6	157.4
July.......	150.2	152.6	222.5	200.1	204.6	159.9
August.....	150.3	151.6	222.6	201.0	204.6	160.4
September..	150.6	150.9	222.7	200.5	202.1	159.7
October....	151.0	150.9	222.8	202.7	205.3	157.6
November..	150.7	152.0	222.8	202.4	205.9	157.7
December..	150.7	153.9	223.0	202.2	205.9	156.2
1926						
January....	151.2	154.3	223.8	202.2	207.1	156.0
February...	151.8	155.3	223.8	201.9	206.5	155.0
March.....	151.9	156.4	224.1	202.0	207.6	151.5
April.......	151.9	154.2	224.7	201.3	207.0	151.1
May.......	151.9	153.1	225.4	202.4	207.3	151.7
June.......	152.1	154.4	225.5	201.9	204.8	152.3
July.......	152.0	154.1	225.7	203.2	207.8	150.7
August.....	152.0	153.1	225.9	203.6	208.3	149.2
September..	152.0	154.2	226.1	203.2	208.3	150.5
October....	152.8	155.4	226.2	202.9	209.8	149.7
November..	153.2	156.6	226.3	203.7	210.8	148.1
December..	153.2	159.2	226.3	203.2	210.8	.....

includes 137 companies, each of which employs more than 100 motormen and conductors, and indicates the trend of the average wage of 105,025 men. The upward trend of the index during 1926 was due principally to increased wages in San Francisco, Philadelphia, Louisville, Cleveland, Connecticut, Detroit, Memphis, Cincinnati, Birmingham, Providence and eastern Massachusetts. Several other increases were noted which affected the index only slightly, either on account of the limited amount of the increase or the relatively small number of men involved. The average wage of the 105,025 men, as compared with 1913, had increased 123.8 per cent up to January, 1926, and 126.3 per cent up to December, 1926, there being an increase of 1.1 per cent during the year 1926. It will be noted that, in comparison with the rise in cost of living, the increase in electric railway wages has been out of all proportion. According to the National Industrial Conference Board, the cost of living since 1914 had increased 70.4 per cent up to January, 1926, and 67.2 per cent up to November, 1926. The average index of the cost of living during 1926 was about 168, and the average index of electric railway wages was about 225. This indicates a very considerable increase in the "real wages" of motormen and conductors, the index representing "real wages" being the index of wages divided by the index of cost of living, or 134. In other words, the average motorman or conductor in the United States has had the opportunity to increase his standard of living since 1914 by about 34 per cent.

CONSTRUCTION COSTS AND WHOLESALE PRICES

Turning to construction costs, the American Electric Railway Association Construction Cost Index, as shown by Fig. 5, has maintained a very constant level during the year, with minor fluctuations between 201.3 and 203.7, as compared with the pre-war level of 100 in 1913. The minor rise occurring about the middle of the year was principally due to the increased wage of common labor, which according to the *Engineering News-Record* averaged 54 cents for the country as a whole in January and had increased to 55½ cents in August, which latter figure was being maintained in December. It will be noted that the index, which averages about 202 for 1926, is somewhat lower than two years ago, when it was about 205, that being the maximum since the post-war low in 1922. Apparently this index is stabilizing at somewhere between 200 and 205 per cent of the pre-war value.

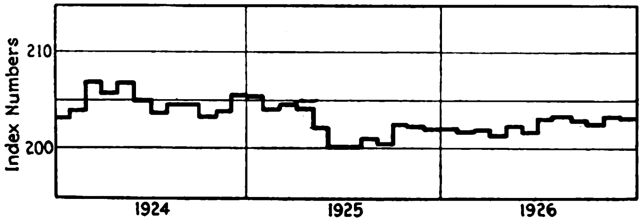


Fig. 5—A.E.R.A. Electric Railway Construction Cost Index (1913 = 100)

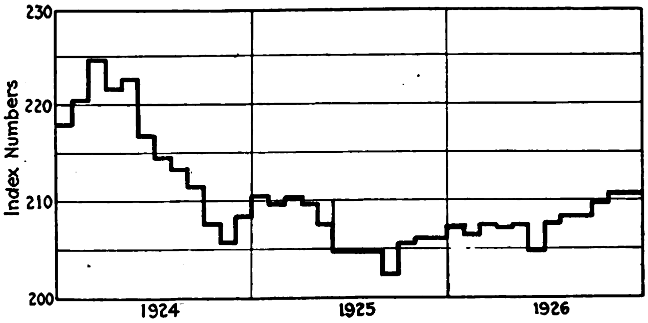


Fig. 6—"Engineering News-Record" Construction Cost Index (1913 = 100)

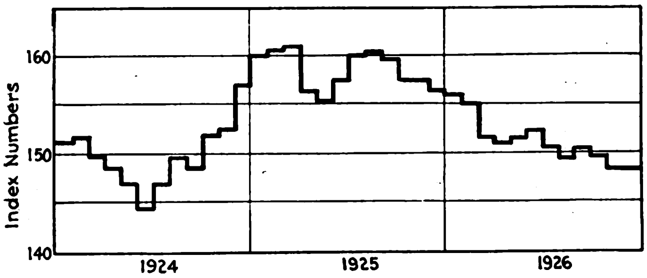


Fig. 7—Index of U. S. Bureau of Labor Statistics Wholesale Commodities (1913 = 100)

The *Engineering News-Record* Construction Cost Index (Fig. 6) applies to construction cost in general, and is here presented as of some value for comparison with the Electric Railway Construction Cost Index. The Electric Railway Index includes a much heavier weighting of labor than the general index, and is further stabilized by the heavier weighting of steel rail, the price of which has remained constant at $43 per ton since October, 1922. The General Construction Cost Index as compared with the Electric Railway Index during 1926 shows a slightly greater tendency upward during the last half of the year, although its reduction as compared with 1924 is considerably greater. The General Construction Cost Index is apparently stabilizing itself at about five points higher than the Electric Railway Construction Cost Index, both on the basis of 1913.

The Wholesale Commodity Index of the U. S. Bureau of Labor Statistics (Fig. 7) is perhaps the most often quoted of any index which purports to show the trend of the general price level. This index reached a maximum of 246.7 in May, 1920, dropped sharply to about 140 in 1921, rose to 158 in 1923, dropped to an average of 150 in 1924, averaged about 157 in 1925, and during the last half of 1923 has been hovering around 150. In other words, for the past several years, while this index has averaged about 150, it has been subject to fluctuations which carried it about ten points above and below that average in cycles of about two years. It is, of course, impossible to foretell its future course, but if the experience of the last four years is of any value, it confirms the opinion previously expressed, that the general price level is tending to fix itself at about 50 per cent above the pre-war level. Electric railway operating materials costs as compared with pre-war levels have increased only about the same amount, or 50 per cent. Construction costs have increased more than 100 per cent and electric railway wages more than 125 per cent. Inasmuch as neither the general commodity index nor the operating materials index contains a labor item, it is fair deduction that the disproportionate rise in electric railway construction and operating costs is due in large measure to the disproportionate increase in wages as compared with that of commodities in general. The fact remains that both construction and operating costs of electric railways have increased very considerably more than the cost of commodities in general, and, further, that the increase in the average fare paid for street railway service in the country as a whole has increased only about the same as commodities in general. The necessity for such operating economies as the light-weight car and one-man operation is evident, when the indexes of street railway fares and wages are compared.

Statistics on Cars and Mileage

IN PREVIOUS statistical issues of this paper, or in issues shortly after the first of the year, it has been customary to include a table showing the number of electric railways in the United States and the miles of track, and number of cars of various kinds owned by these companies. This table has been compiled each year from the issue of the McGraw Electric Railway Directory published shortly after the first of each year.

Owing to changes in the publication date of this directory, the collection of statistics for it has not progressed sufficiently to permit the publication of a similar table at this time. It is expected, however, that such a table, as of Jan. 1, 1927, will appear in pages of ELECTRIC RAILWAY JOURNAL before long.

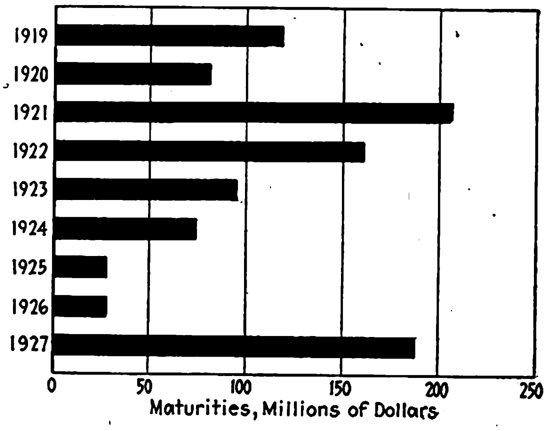
Total of New Securities Publicly Offered Was Small

RECORDS of financing for 1926 of companies doing purely a railway business make it appear that the issues in amount of more than $500,000 placed publicly totaled $11,100,000. This is less than half the total so placed during the previous year. But compared with the average it shows up favorably. The amount is determined largely by the volume of maturities from year to year. It takes no account of such issues as were placed privately by the investment bankers, and does not take into account equipment trust issues sold similarly, of which, of course, there is no public record. It would be idle to speculate about the bulk of this business. As regards the financing of new buses purchased, the amount probably is sizable, but no records are available about it, for the paper is placed privately.

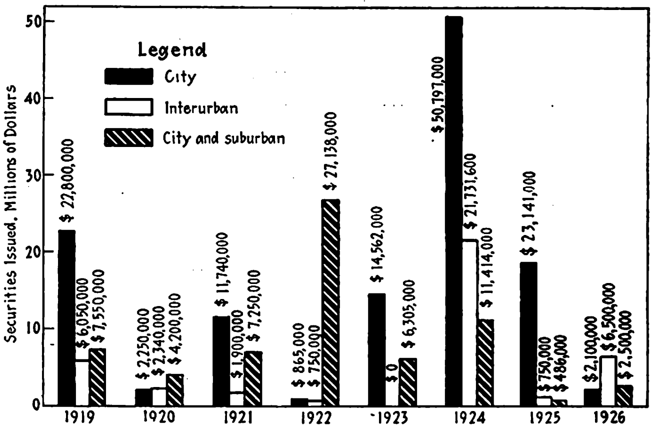
There is no blinking the fact that the companies doing a purely railway business have been living out of earnings, not capital. They have been husbanding their resources, but the financing done publicly, small though it may bulk in the aggregate, has been done on moderate terms. The records bear this out. With the improvement being shown in the earnings situation generally and the tendency of money rates to ease off, it would seem likely that when the railways do appear again publicly to finance their requirements they will be able to do so on terms fairly favorable to themselves. The Gary financing, in particular, seems to be a case in point. This little road, thoroughly rehabilitated, has re-established its earning power, and Halsey, Stuart & Company, who did the financing of the railway's equipment trust obligations, did not hesitate unequivocally to recommend the securities at prices that were not inordinate, namely, 5.50 to 6 per cent. Similarly Blyth, Witter & Company offered the first mortgage obligations of the city and suburban property of the Key System Transit Company at a price to yield 5.78 per cent. The Philadelphia Rapid Transit Company equipment trust issue speaks for itself. So does the Chicago, North Shore & Milwaukee issue. The Chicago, Aurora & Elgin Railroad issue was somewhat different. Here is a road recently rehabilitated earning its interest a little more than twice over, still the issuing price was reasonable, based undoubtedly on the prospective probable future earning capacity of the company. So much for the financing that has been done.

As for the future, the industry is faced with maturities of $180,798,000 in 1927 compared with only $26,644,790 in 1926. The great bulk of this, however, is made up of issues of the surface line companies at Chicago. This amount is close to $145,000,000, but the earning capacity of the roads is well established. It is only the political situation with franchises about to expire that causes any concern with respect to the matter there. It is, of course, impossible to hazard a guess at this time regarding probable impending events in Chicago, but the course things are taking indicates that the full measure of protection will be available to the holders of these securities.

It takes time to amend the consequences of events such as the electric railways experienced in the war-time and post-war periods, but the results are beginning to manifest themselves. Let it be recalled, incidentally, that the steam railroads suffered no less acutely than did the electric railways during this period, and they are only just now beginning to re-establish themselves financially. It might be said by some that there is small comfort in this, but that is not altogether so. True, $126,556,400 of traction securities still are in default, but some of them date back—in the unusual case of the Second Avenue Railroad, New York—to 1908. The amount of such defaults has been constantly diminishing in the last few years, and the prospects are that many other issues of the kind will be eliminated from the list now that the earning power of many of the properties is being re-established. It might at first appear that succor has long been delayed to the investor in some of these cases, but the length of time is not the real criterion. Rather is it the enduring accomplishment that has been achieved in the interim. It is not so easy always to accept this view, but it is the correct one just the same. After all, the basis of any security is the earning power of the property on which it is a lien. This is true even of bonds secured on real estate, the supposed premier investment.



Maturities in 1927 Are Larger than for Any Recent Year Except 1921



Securities Issued for Electric Railway Properties Were Smaller than for Several Years

Details of New Bond and Note Financing in Amounts of More than $500,000 Offered Publicly in 1926

Issue	Price	Maturity	Yield	Amount
January				
Gary Railways equipment trust certificates, Series A 5½	1.00 to 97.89	1930	5.50 to 6	$350,000
Chicago, Aurora & Elgin Railroad first and refunding 6's	96	1951	5.30	5,000,000
February				
Philadelphia Rapid Transit equipment trust 5's, Series J	....	1929	4.75 to 5.35	1,750,000
Key System Transit Company first mortgage 5½	97½	1938	5.78	2,500,000
September				
Chicago, North Shore & Milwaukee Railroad first and refunding mortgage 5½	98.50	1956	5.60	1,500,000
Total				$11,100,000

Eight-Year Record of New Electric Railway Financing Involving Bond or Note Issues of More than $500,000

	City Railway	Interurban	City and Suburban
1919	$22,800,000	$6,050,000	$7,550,000
1920	2,250,000	2,340,000	4,200,000
1921	11,740,000	1,900,000	7,250,000
1922	865,000	750,000	27,138,000
1923	14,562,000	....	6,305,000
1924	50,797,000	21,731,600	11,414,000
1925	23,141,000	750,000	486,000
1926	2,100,000	6,500,000	2,500,000

Principal Electric Railway Maturities in 1927 Based on Dow, Jones & Company's Compilation

January	Rate	Amount
Chicago City & Connecting Railways clt	5	$20,616,000
Winnipeg Electric Street Railway 1st	5	579,000
Interborough Rapid Transit equipment trust B	6½	450,000
Springfield & Eastern Street Railway 1st	7	330,000
Eastern Massachusetts Street Railway serial	6	300,000
New Bedford & Onset Street Railway 1st	6	280,0000
Peoples Railway 1st	5	200,000
Wayne & Fifth Street Railroad 1st	5	200,000
Brooklyn City Railroad equipment trust	5	375,000
		$23,330,000

February	Rate	Amount
Chicago Railways 1st	5	$55,655,000
Chicago City Railway 1st	5	33,926,000
Chicago Railways Consolidated B	5	17,164,470
Chicago Railways Consolidated A	5	16,703,800
Calumet & South Chicago 1st	5	5,458,000
Chicago Railways purchase money	5	3,969,300
West End Street Railway debenture	6½	2,700,000
Chicago Railways income	4	2,500,000
Philadelphia Rapid Transit equipment trust G	5½	237,500
Hagerstown & Northern Railroad 1st	5	200,000
Pittsburgh Railways car trust	6	200,000
		$138,714,040

March	Rate	Amount
Interborough Rapid Transit equipment trust A	6	$280,000
		$280,000

April	Rate	Amount
Denver City Tramway extended	6	$2,000,000
Detroit, Ft. Wayne & Belle Isle 1st	5	857,000
Denver Tramway Power extended	6	693,000
Des Moines City Railway 5-year	7	618,000
Enid City Railway 1st	5	235,000
		$4,403,000

May	Rate	Amount
West End Street Railway 5-year	6	$1,956,000
Jacksonville Electric (now traction) 1st	5	1,245,000
New Castile Traction 1st	5	470,000
		$3,271,000

June	Rate	Amount
Galveston-Houston Electric 2-year	7	$1,200,000
Berkshire Street Railway extended	7	777,000
Buffalo, Bellevue & Lancaster 1st	5	215,000
		$2,192,000

July	Rate	Amount
Lorain & Cleveland Railway 1st	5	$750,000
		$750,000

August	Rate	Amount
United Railways & Electric Company of Baltimore 5-year	6	$2,500,000
Phila. Rapid Transit equipment trust G	5½	237,500
New Albany (Ind.) Street Railroad 1st	5	234,000
		$2,971,500

September	Rate	Amount
Worcester & South Bridge Street Railway	7	$500,000
		$500,000

October	Rate	Amount
South Bend & Southern Michigan Railway 1st	5	$750,000
Pittsburgh Traction 1st	5	684,000
Citizens Traction, Pittsburgh 1st	5	657,000
		$2,091,000

November	Rate	Amount
Worcester Consolidated Street Railway debenture	5	$1,200,000
Interborough Rapid Transit equipment trust C	6	570,000
		$1,770,000

December	Rate	Amount
Phila. Rapid Transit equipment trust H	5½	$270,000
Scranton Railway guaranteed notes	6	458,690
Altoona & Logan Valley Railway guaranteed	6	247,560
		$975,560

Total 1927	$180,798,000
Total 1926	26,644,790

Comparison of Maturities in the Electric Railway Field

1927	$180,798,000	1922	$160,015,860
1926	26,644,790	1921	207,617,530
1925	28,224,000	1920	80,466,100
1924	73,051,600	1919	116,785,500
1923	94,851,800		

Below are given electric railway bonds in default of interest as of Dec. 31, 1926, with amount and date of default, based on Dow, Jones & Company's compilation for the entire utility industry. Where the maturity date appears after the issue, it means there is default as to principal as well as to interest. Technical defaults are not included in this table:

Electric Railway Bonds in Default as of Dec. 31, 1926

Public Utility Issues:	Amount	Defaulted
Auburn & Syracuse Electric 5s	$1,752,000	Apr. 1926
Binghamton Railway cons. 5s	1,833,000	May 1926
General and refunding 6s	426,200	July 1925
Binghamton Railroad 6s, 1925	452,000	July 1925
Bing, Lester & Union Ry. 5s, 1925	147,000	June 1925
Boise Valley Traction 5s, 1925	750,000	Jan. 1923
Boise & Interurban Ry 1st 5s	964,000	Apr. 1925
Buffalo & Lackawanna Traction 5s	1,150,000	Dec. 1918
Chatham, Wallaceb. & L. E. 5s, 1925	694,500	July 1925
Chicago & Interurban Traction 5s	1,816,000	Jan. 1922
Cin., Lawrence & A. St. Ry. 5s, 1919	750,000	Jan. 1918
Columbia & Montour El. Ry. 5s	375,000	July 1914
Columb., Lond. & Springfield 5s, 1920	1,260,000	Oct. 1920
Dayton, Cov. & Piqua Trac. 5s, 1922	490,000	Apr. 1922
Detroit, Altmont & Northern 6s	400,000	Aug. 1925
Detroit, Jackson & Chicago Ry. 5s	881,000	July 1925
Detroit, Monroe & Toledo Sh. L. 5s	3,000,000	July 1925
Detroit & Port Huron Sh. L. 5s	2,497,000	July 1925
Detroit United coll. tr. 6s	8,472,000	July 1925
Two-year coll. tr. notes 6s, 1926	640,000	Aug. 1925
Det, Ypsilan, Ann Arb. & Jack. 5s	1,610,000	Aug. 1925
Geneva, Seneca Fall & Aub. R. R. 5s	497,000	Jan. 1926
Gd. Rapids, Gd. Haven & M. 5s, 1926	1,500,000	Jan. 1926
Gd. Rapids, Holland & L. M. 5s, 1924	1,500,000	Aug. 1924
Indiana, Col. & Eastern Trac. 5s	6,400,000	Nov. 1919
Indiana Northern Traction 5s	500,000	Apr. 1925
Indiana Union Trac. 1st 5s	1,620,000	Apr. 1925
Indianapolis & Cincinnati Traction 5s	1,400,000	July 1923
Indianapolis, Newcastle & East., 6s	1,200,000	June 1925
Indianapolis Northern Traction 5s	5,000,000	Jan. 1925
Indianapolis, Shelby & S. E. Traction 5s	414,000	July 1923
Indianapolis & Southeastern Traction 5s	586,000	July 1923
Jackson Consol. Traction 5s	790,000	May 1925
Jefferson Traction 6s, 1925	434,000	Jan. 1925
Kansas City, Lawr. & Top. R.R. 5s	400,000	Sept. 1919
Kansas-Oklahoma Traction 6s	250,000	Nov. 1924
Lakeside Railway 1st 6s	150,000	May 1926
Lima, Findlay & Ohio Ry. 5s, 1925	324,000	Jan. 1925
Lowell & Fitchburg St. Ry. 5s, 1926	275,000	Jan. 1926
Michigan Electric Ry. ref. 5s	7,190,500	Jan. 1925
Michigan Railroad 1st 6s	4,050,000	May 1924
Milford, Hollis & Framingham 7s	165,000	July 1925
Milford & Uxbridge St. Ry. 7s	335,000	July 1925
Millvale, Etna & Sharp 5s, 1923	741,000	Nov. 1923
Minn., Anoka & Cuyuna Range 5s	380,000	Nov. 1925
Morris County Traction 1st 5s	3,000,000	June 1922
Muncie, Hartford & Ft. Wayne 5s	916,000	Jan. 1925
Muncie & Union City Traction 5s	925,000	Jan. 1925
New York & Queens County Ry. cons 4s	1,300,000	Apr. 1922
Northern Cambria Ry. 1st 5s	250,000	Nov. 1924
Olean, Brad. & Salamanca Ry. 7s	264,000	Sept. 1926
Penn Street Ry. 1st 5s, 1922	250,000	June 1922
Pitts, Crafton & Mansfield 5s, 1924	171,000	July 1924
Pitts. & W. End Pass. Ry. 5s, 1922	313,000	July 1922
Rockford, Beloit & Janesville 5s	907,000	Apr. 1925
Rockford & Freeport Elec. Ry. 5s	490,000	Nov. 1925
Rockford & Interurban Ry. 5s	1,685,500	Oct. 1925
St. Louis & Suburban gen. 5s, 1923	4,500,000	Apr. 1923
Consolidated 8s, 1923	2,000,000	Oct. 1923
St. Louis Transit 5s, 1924	9,790,000	Apr. 1924
Salt Lake & Utah 1st 5s	1,431,900	Oct. 1925
Convertible notes 7s	150,000	Oct. 1925
Schuykill Railway 1st 5s	640,000	Apr. 1926
Schuykill Traction 1st 5s	500,000	Apr. 1926
Consolidated 4½s	105,000	July 1926
Second Avenue R.R. cons. 5s	5,631,000	Aug. 1908
Receivers' certificates 6s, 1924	3,140,000	Oct. 1914
Steinway Railway 6s, 1922	1,500,000	July 1922
Trenton, Bristol & Phila 5s	413,800	Mar. 1925
Union Traction of Indiana 6s	4,623,000	Jan. 1925
Union Traction Coffeyville 5s	900,000	Jan. 1925
Wash., Alex. & Mt. Vernon Ry. 5s	2,500,000	Sept. 1920
Wash., Arling. & Falls Church 5s	650,000	Sept. 1920
Second 5s	250,000	Apr. 1921
Wash., Virginia Ry. notes A 6s, 1922	759,500	Jan. 1922
B notes 6s, 1922	666,500	Jan. 1922
Waterloo, Cedar Falls & Nor. 5s	5,773,000	Jan. 1922
Western Ohio Ry. 1st 5s, 1921	2,500,000	Nov. 1921
Youngstown & Ohio River 1st 5s	1,200,000	Oct. 1926
Total in default	$126,556,400	

Bus Development Continued Steadily

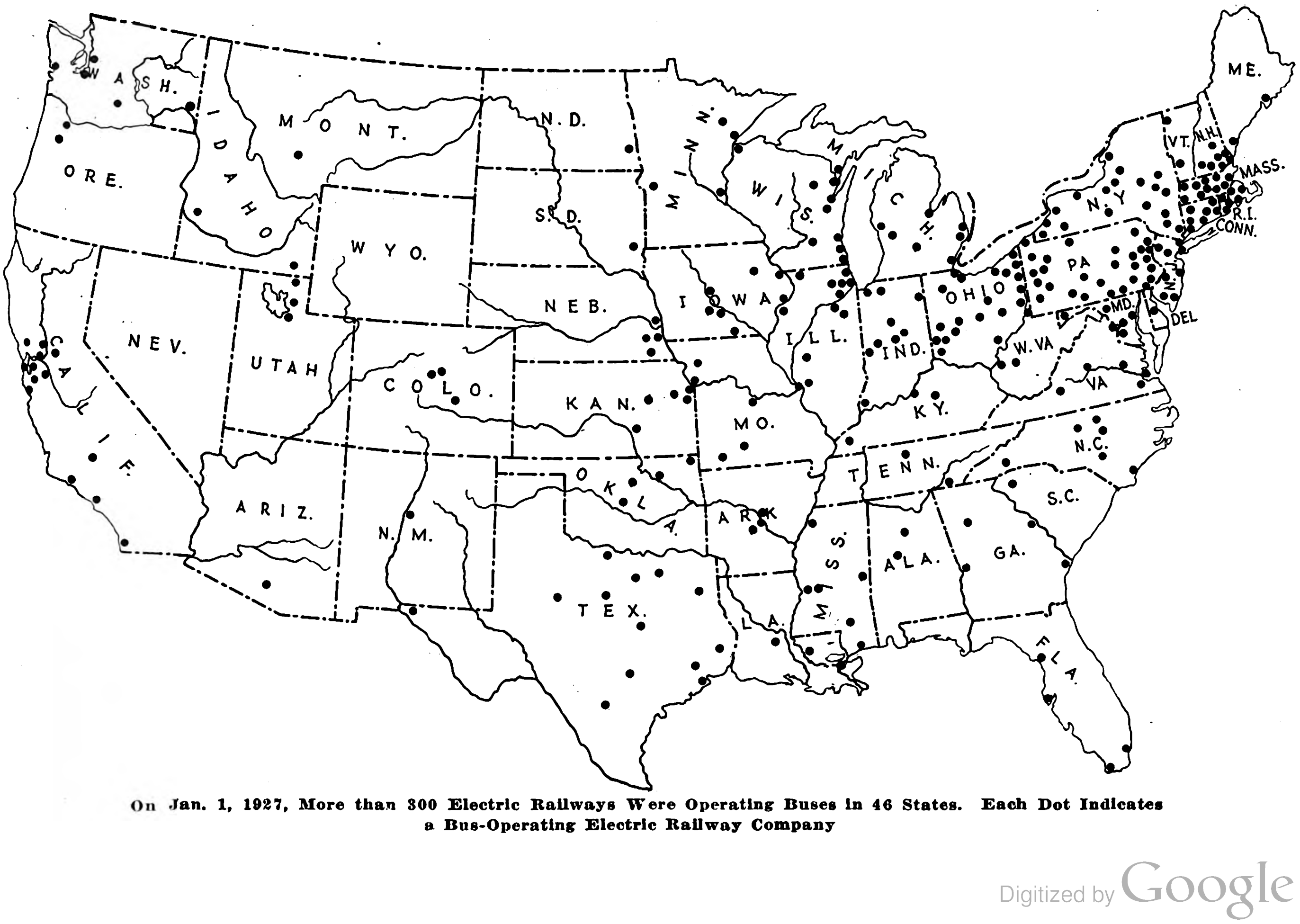
Number of Electric Railways Engaged in Bus Operation Increased Approximately 20 Per Cent During 1926, While the Number of Buses Increased More than 40 Per Cent—Much New Route Mileage Added—Replacement of Rail Service Comparatively Slight—Large Purchases Made of Other Automotive Equipment

EXPANSION of bus operations by electric railways in the United States and Canada continued steadily during the year just ended. According to reports received by ELECTRIC RAILWAY JOURNAL from properties representing over 95 per cent of the industry, 280 electric railways were operating a total of 5,358 buses on Jan. 1, 1926. A survey just completed shows that on Jan. 1, 1927, some 333 such companies are operating 7,749 buses. Thus during the year there has been an increase of approximately 20 per cent in the number of operating companies and more than 40 per cent in the number of buses. A list of electric railways now engaged in bus operation is given in Table I, together with the number of buses owned and the names of subsidiary companies.

First place in the number of buses operated is still held by Public Service Railway with 1,204. Philadelphia Rapid Transit Company is again second with 382. Next in point of numbers come the Department of Street Railways, City of Detroit, with 303 buses. In the list there are altogether fifteen companies having more than 100 buses each. In addition to the companies named, these are the Boston Elevated Railway, Connecticut Company, Virginia Electric & Power Company, Illinois Power & Light Corporation, South Shore Motor Coach Company, Detroit United Railway, Twin City Rapid Transit Company, Cleveland Railway, Northern Ohio Power & Light Company, Pennsylvania-Ohio System, the Milwaukee Electric Railway & Light Company, the Los Angeles Railway and the Pacific Electric Railway.

In contrast to the large number of electric railways which have been added to the list of bus operators during the year just ended, only four of those formerly engaged in bus operation have now abandoned it. These are the Stockton Electric Railroad in California, the Stark Electric Railroad in Ohio, the Reading Transit Company in Pennsylvania, and the Nova Scotia Tramways & Power Company. Fifteen others have given up portions of their bus route mileage while continuing the operation elsewhere. Altogether about 200 miles of bus route has been abandoned during the year.

Subsidiary companies are utilized by about one-third the electric railways engaged in bus operation. Joint subsidiaries for two or more electric railways are gaining in popularity. Outstanding examples include the Los Angeles Motor Bus Company, a joint subsidiary of the Los Angeles Railway and the Pacific Electric Railway; the Shore Line Motor Coach Company, a joint subsidiary of the Chicago, South Shore & South Bend



On Jan. 1, 1927, More than 300 Electric Railways Were Operating Buses in 46 States. Each Dot Indicates a Bus-Operating Electric Railway Company

Table I—Bus Operation by Electric Railways and Subsidiary Companies

	Buses Owned
Connecticut	
Connecticut Co.	113
Danbury Power & Transportation Co.	16
Groton & Stonington Traction Co.	3
*Hartford & Springfield Street Ry.	21
*Lordship Ry.	6
New Haven & Shore Line Ry.	13
Waterbury & Mildale Tramway	3
Maine	
Central Maine Power Co.	(b) 1
York Utilities Co.	8
Massachusetts	
Boston Elevated Ry.	227
Boston & Worcester Street Ry.	19
Eastern Massachusetts Street Ry.	65
Fitchburg & Leominster Street Ry.	5
Gardner-Templeton Street Ry.	4
Holyoke Street Ry	3
Interstate Street Ry.	(a) 8
Middlesex & Boston Street Ry	45
New Bedford & Onset Street Ry.	5
Plymouth & Brockton Street Ry.	3
Springfield Street Ry.	27
Union Street Ry.	12
Worcester Consolidated Street Ry.	17
New Hampshire	
Dover, Somersworth & Rochester Street Ry.	6
*Exeter, Hampton & Amesbury Street Ry.	6
*Keene Electric Ry.	8
*Laconia Street Ry.	5
*Manchester & Derry Street Ry.	3
Nashua Street Ry.	3
*Portsmouth Electric Ry.	12
Rhode Island	
*Newport Electric Corp.	21
Newport & Providence Ry.	10
United Electric Rys.	70
Vermont	
Burlington Traction Co.	1
*Twin State Gas & Electric Co.	3
Delaware	
Wilmington & Philadelphia Traction Co.	45
Delaware Bus Co.	
Southern Pennsylvania Bus Co.	
District of Columbia	
Capital Traction Co.	27
Washington & Old Dominion Ry.	1
Washington Railway & Electric Co.	57
Washington-Virginia Ry.	5
Alexandria & Suburban Motor Vehicle Co.	
Maryland	
Cumberland & Westernport Electric Ry.	4
Cumberland & Westernport Transit Co.	
Hagerstown & Frederick Ry.	47
Blue Ridge Transportation Co.	
United Rys. & Electric Co.	82
Baltimore Transit Co.	
East Fayette Street Bus Co.	
New Jersey	
Coast Cities Ry.	23
Atlantic Coast Transportation Co.	
Cumberland Traction Co.	15
Cumberland Transit Co.	
Morris County Traction Co.	9
*New Jersey Inter-Urban Co.	6
New Jersey Interurban Coach Co.	
Ocean City Electric R.R.	1
Public Service Ry.	1204
Public Service Transportation Co.	
Penn-Jersey Transit Co. (c)	
Trenton & Mercer County Traction Corp.	29
Central Transportation Co.	
New York	
Auburn & Syracuse Electric R.R.	8
Mid-State Coach Lines (c).	
Binghamton Ry.	11
Black River Traction Co.	15
Watertown Transportation Co.	
Brooklyn-Manhattan Transit Corp.	(b) 10
Buffalo & Erie Ry.	(a) 1
Buffalo & Erie Coach Corp.	
Cortland County Traction Co.	3
Cortland County Bus Lines	
Empire State R.R.	6
Mid-State Coach Lines (c).	
Fonda, Johnson & Gloversville R.R.	1
Sacandaga Valley Transportation Co.	
Geneva, Seneca Falls & Auburn R.R.	3
International Ry.	67
International Bus Corp.	
Jamestown Street Ry.	10
Jamestown Motor Bus Transportation Co., Inc.	
Kingston Consolidated R.R.	5
Kingston City Transportation Corp.	
*Newburgh Public Service Co.	22
New York Rys.	(b) 1
New York State Rys. (Rochester)	64
Darling Bus Line, Inc.	
East Avenue Bus Co., Inc.	
Rochester Interurban Bus Co., Inc.	
Rochester Rys. Co-ordinated Bus Lines, Inc.	
New York State Rys (Syracuse)	17
Syracuse Railway Co-ordinated Bus Line, Inc.	
New York State Rys. (Utica)	9
Utica Railway Co-ordinated Bus Line, Inc.	
Niagara Gorge R.R.	4
Niagara Gray Bus Lines	
Olean, Bradford & Salamanca Ry.	5
Olean, Bradford & Salamanca Bus Line, Inc.	
*Peekskill Lighting & R.R. Co.	9
Peekskill Motor Bus Corp.	
*Port Jervis Transit Co.	2
Rochester & Syracuse R.R.	1
Mid-State Coach Lines, (c).	
Syracuse & Eastern R.R.	3
Third Avenue Ry.	20
Eastchester Transportation Corp.	
North Street Transportation Corp.	
Westchester Street Transportation Co.	
United Traction Co. of Albany	49
Capital District Transportation Co.	
*Walkill Transit Co.	8
Pennsylvania	
Altoona & Logan Valley Electric Ry.	20
Logan Valley Bus Co.	
Bangor & Nazareth Transit Co.	3
Bangor & Portland Transit Co.	2
Paul R. La Bar.	
Beaver Valley Traction Co.	16
Beaver Valley Motor Coach Co.	
Chambersburg & Shippensburg Ry.	3
Cumberland Valley Transit Co.	
Citizens Traction Co.	13
Citizens Transit Co.	
Conestoga Traction Co.	4
Conestoga Transportation Co.	
Duquesne & Dravosburg Street Ry	2
Erie Rys.	6
Erie Coach Co.	
Johnstown Traction Co.	11
Traction Bus Co.	
Lackawanna & Wyoming Valley R.R.	5
Laurel Line Bus Co.	
Lehigh Traction Co.	10
Hazleton Auto Bus Co.	
Lehigh Valley Transit Co.	16
Lehigh Valley Transportation Co.	
Lewiston & Reedsville Electric Ry.	3
Lewiston & Reedsville Transportation Co.	
Northumberland County Ry.	3
Sunbury Transit Co.	
Northwestern Electric Service Co.	5
Penn Public Motor Transportation Co.	
Philadelphia Rapid Transit Co.	382
Philadelphia Rural Transit Co.	
Penn-Jersey Transit Co. (C)	
Philadelphia & Westchester Traction Co.	19
Aronimink Transportation Co.	
Philadelphia & Western Ry.	2
Main Line Transfer Co.	
Pittsburgh, Harmony, Butler & New Castle Ry.	
Pittsburgh, Mars & Butler Ry.	8
Harmony Short Line Motor Transp. Co.	
Pittsburgh Rys.	34
Pittsburgh Motor Coach Co.	
Schuylkill Ry.	11
Schuylkill Transportation Co.	
Scranton Ry.	11
Scranton Bus Co.	
Shamokin & Edgewood Electric Ry.	5
Shamokin & Trevorton Bus Line.	
Southern Cambria Ry.	4
Southern Cambria Bus Co.	
Stroudsburg Traction Co.	3
East Stroudsburg Bus Co.	
*United Traction Street Ry.	2
Du Bois Transit Co.	
West Chester Street Ry.	65
Peoples Transportation Corp.	
Westmoreland County Ry.	5
Chestnut Ridge Transportation Co.	
West Penn Rys.	2
Penn Bus Lines.	
Westside Electric Street Ry.	3
Westside Motor Transit Co.	
Wilkes-Barre Ry.	21
Williamsport Passenger Ry.	2
Williamsport Transportation Co.	
York Rys.	4
York Transit Co.	
Virginia	
Lynchburg Traction & Light Co.	2
Newport News & Hampton Ry., Gas & Elec. Co.	4
Norfolk Southern R.R.	3
Roanoke Railway & Electric Co.	5
Virginia Electric & Power Co.	235
West Virginia	
Charleston Interurban R.R.	33
Monongahela-West Penn Public Service Co.	13
Ohio Valley Electric Ry.	23
Ohio Valley Bus Co.	
Wheeling Public Service Co.	4
Wheeling Traction Co.	
Ohio Valley Transit Co.	11
Illinois	
Aurora, Elgin & Fox River Electric Co.	5
Central Illinois Public Service Co.	5
Chicago, Aurora & Elgin R.R.	2
Chicago & Joliet Electric Ry.	9
Chicago & Joliet Transportation Co.	
Chicago, North Shore & Milwaukee R.R.	47
Chicago & West Towns Ry.	22
East St. Louis & Suburban Ry.	35
Blue Goose Motor Coach Co.	
Red Line Motor Bus Co.	
Evanston Ry.	12
Evanston Bus Co.	
Illinois Power Co.	12
Illinois Power & Light Corp.	
(Bloomington)	7
(Champaign)	12
(Danville)	4
(Decatur)	19
(Galesburg)	8
(Jacksonville)	3
(Peoria)	16
(Quincy)	10
Illinois Traction System.	
(Main Line Division)	8
(Valley Division)	7
*Joliet, Plainfield & Aurora Transportation Co.	5
Rockford City Traction Co.	9 (a) 18
Rockford & Interurban Ry.	6
Indiana	
Chicago, South Bend & Northern Indiana Ry.	24
Railway Transit Lines.	
Chicago, South Shore & South Bend R.R.	123
Gary Railways.	
Shore Line Motor Coach Co.	
Evansville & Ohio Valley Ry.	2
Indianapolis & Cincinnati Traction Co.	4
Indianapolis Street Ry.	33
Indiana Service Corp.	25
Interstate Public Service Co.	43
Northern Indiana Power Co.	2
Southern Indiana Gas & Electric Co.	10
Terre Haute, Indianapolis & Eastern Traction Co.	40
Indiana Motor Transit Co.	
Union Traction Co.	38
Iowa	
Des Moines City Ry.	6
Des Moines & Central Iowa R.R.	3
Des Moines Electric Light Co.	6
Dubuque Electric Co.	7
Fort Dodge, Des Moines & Southern R.R.	16
Fort Dodge, Des Moines & Southern Transportation Co.	
Iowa Railway & Light Co.	2
Iowa Southern Utilities Co.	
(Burlington)	8
(Centerville)	3
(Ottumwa)	6
Mississippi Valley Electric Co.	5
Tri-City Ry.	9
Waterloo, Cedar Falls & Northern Ry.	8
Kentucky	
Kentucky Traction & Terminal Co.	27
Kentucky Coach Co.	
Kentucky Utilities Co. (Paducah)	6
Louisville Ry.	17
Kentucky Carriers, Inc.	
Michigan	
City of Detroit, Department of Street Rys.	303
Detroit United Ry.	194
Peoples Motor Coach Co.	
Grand Rapids Ry.	10
Menominee & Marinette Light & Traction Co.	1
Michigan R.R.	14
Michigan Electric Ry.	32
Muskegon Traction & Lighting Co.	2
Saginaw Transit Co.	28
Minnesota	
Duluth Street Ry.	10
Duluth-Superior Coach Co.	
Mesaba Ry.	
Mesaba Railway-Coach Co	16
Twin City Rapid Transit Co.	102
Twin City Motor Bus Co.	
Missouri	
Kansas City, Clay County & St. Joseph Ry.	16
Kansas City, Clay County & St. Joseph Auto Transit Co.	
Kansas City Public Service Co.	69
Missouri Power & Light Co.	2
Southwest Missouri R.R.	10
Springfield Traction Co.	12
United Rys. of St. Louis	40
St. Louis Bus Co.	
*West Missouri Power Co.	2
Ohio	
Cincinnati, Lawrenceburg & Aurora Electric Street Ry.	7
Cincinnati Street Ry.	67
City of Ashtabula—Division of Street Rys.	3
Cleveland Ry.	111
Cleveland, Southwestern Ry. & Light Co.	3
Southwestern Bus Co.	
Columbus Railway, Power & Light Co.	3
*Columbus, Urbana & Western Electric Ry.	2
Community Traction Co.	30
Dayton Street Ry.	3
Dayton, Springfield & Xenia Southern Ry.	2
Indiana, Columbus & Eastern Traction Co.	37
Dayton & Columbus Transportation Co.	
Lake Shore Electric Ry.	3
Nelsonville-Athens Electric Ry.	1
Nelsonville Transportation Co.	
Northern Ohio Power & Light Co.	213
Ohio Service Co.	5
Ohio Public Service Co.	3

Table I—Bus Operation by Electric Railways and Subsidiary Companies (Concluded)

	Buses Owned
Pennsylvania-Ohio Electric Co.	120
Youngstown Municipal Ry.	
Akron-Youngstown Bus Co.	
Cleveland-Mahoning Valley Coach Line, Inc.	
Penn-Ohio Coach Lines Co.	
Penn-Ohio Tourist Co.	
Portsmouth Public Service Co.	9
Southern Ohio Public Service Co.	14
Springfield Ry.	1
Steubenville, East Liverpool & Beaver Valley Traction Co.	4
Toledo & Indiana R.R.	1
Toledo & Northwestern Transportation Co.	
Youngstown & Ohio R.R.	4
Youngstown & Suburban Ry.	14
Columbus Bus Co.	
Youngstown & Suburban Tourist Lines, Inc.	
Youngstown & Suburban Transportation Co.	
Wisconsin	
Madison Rys.	10
Milwaukee Electric Ry. & Light Co.	133
Wisconsin Motor Bus Lines	
Wisconsin Gas & Electric Co.	10
Wisconsin Power & Light Co.	40
The Orange Line.	
Wisconsin Public Service Corp.	8
Riverview Motor Bus Co.	
Wisconsin Traction, Light, Heat & Power Co.	5
Wisconsin Valley Electric Co.	4
Alabama	
Birmingham Electric Co.	4
*Selma Electric Rys.	3
Arkansas	
Arkansas Power & Light Co.	11
Hot Springs Street Ry.	2
Intercity Terminal Ry.	6
Florida	
*Key West Electric Co.	10
Miami Beach Ry.	50
Municipal Ry. of St. Petersburg.	8
Tampa Electric Co.	31
Georgia	
Augusta-Aiken Ry. & Electric Co.	(*b*) 1
Columbus Electric & Power Co.	22
Columbus Transportation Co.	
*Fairburn & Atlanta Ry. & Electric Co	4
Georgia Railway & Power Co.	32
Atlanta Coach Co.	
Savannah Electric & Power Co.	3
Louisiana	
Baton Rouge Electric Co.	3
New Orleans Public Service, Inc.	30
Mississippi	
Mississippi Power Co.	
(*Gulfport Division*)	20
(*Hattiesburg Division*)	7
(*Meridian Division*)	7
Mississippi Power & Light Co.	
(*Jackson Division*)	1
(*Vicksburg Division*)	2
North Carolina	
Carolina Power & Light Co.	19
Durham Public Service Co.	17
North Carolina Public Service Co.	2
Greensboro Bus Co.	
Southern Public Utilities Co.	7
Tidewater Power Co.	3
Coast City Transit Co.	
South Carolina	
South Carolina Gas & Electric Co.	8
Tennessee	
Nashville Interurban Ry.	9
Interurban Bus Co.	
Nashville Ry. & Light Co.	13
Tennessee Electric Power Co.	5
Union Traction Co.	1
Arizona	
Tucson Rapid Transit Co.	5
California	
Bakersfield & Kern Electric Ry.	6
Eureka Street Ry.	1
Key System Transit Co.	47
Los Angeles Ry.	110
Los Angeles Motor Bus Co. (*c*)	
Market Street Ry.	4
Municipal Ry. of San Francisco.	20
Pacific Electric Ry.	125
Los Angeles Motor Bus Co. (*c*)	40
Pacific Gas & Electric Co.	6
Peninsular Ry.	8
San Diego Electric Ry.	15
San Francisco-Sacramento R.R.	1
San Jose Railroads	4
Santa Barbara & Suburban Ry.	8
Southern Pacific Co. (*Electric Division*)	14
Union Traction Co., Santa Cruz	4
Colorado	
Colorado Springs & Interurban Ry.	6
*Denver & Interurban R.R.	8
Denver & Interurban Motor Co.	
*Denver & South Platte Ry.	2
Denver & South Platte Transportation Co.	
Denver Tramway	4
Bus Transportation Co.	
Idaho	
*Boise Street Car Co.	4
Kansas	
Arkansas Valley Interurban Ry.	19
Arkansas Valley Transportation Co.	
Kansas Electric Power Co.	5
Kansas Public Service Co.	2
Kansas City, Leavenworth & Western Ry.	7
Leavenworth Transportation Co.	
*Salina Street Ry.	1
Topeka Ry.	23
United Power & Light Corp.	2
Wichita Railroad & Light Co.	13
Montana	
Butte Electric Ry.	3
Nebraska	
Lincoln Traction Co.	14
Omaha & Council Bluffs Street Ry.	10
Omaha, Lincoln & Beatrice Ry.	3
Omaha & Lincoln Railway & Light Co.	6
New Mexico	
City Electric Co., Albuquerque	1
North Dakota	
Northern States Power Co.	2
Northern Transit Co.	
Oklahoma	
Northeast Oklahoma R.R.	5
Oklahoma Ry.	19
Oklahoma Union Ry.	75
*Okmulgee Traction Co.	3
Tulsa Street Ry.	17
Oregon	
Portland Electric Power Co.	32
*Southern Pacific System (Salem)	3
South Dakota	
Sioux Falls Traction System	16
Texas	
Abilene Traction Co.	2
Austin Street Ry.	1
Dallas Ry. & Terminal Co.	7
Eastern Texas Electric Co.	5
El Paso Electric Co.	3
Galveston Electric Co.	
Texas Bus Lines, Inc.	4
Houston Electric Co.	36
*Marshall Traction Co.	3
Northern Texas Traction Co.	4
*Nueces Ry.	2
San Antonio Public Service Co.	43
*Southwestern Traction Co.	3
Texas Electric Ry.	6
Wichita Falls Traction Co.	8
Utah	
Bamberger Electric R.R.	2
Utah-Idaho Central R.R.	4
Utah Light & Traction Co.	3
Washington	
Grays Harbor Ry. & Light Co.	3
Lewiston-Clarkston Transit Co.	1
Pacific Northwest Traction Co.	20
Puget Sound International Ry. & Power Co.	16
Puget Sound Power & Light Co.	7
Seattle Municipal Ry.	38
Seattle & Rainier Valley Ry.	2
Yakima Valley Transportation Co.	3
Canada	
British Columbia Electric Ry.	21
Grand River Ry.	3
Hamilton Street Ry.	10
Hydro-Electric Rys.	
(Guelph District)	1
(Peterboro District)	5
(Windsor District)	11
London Street Ry	7
Montreal Tramways	55
Ottawa Electric Ry.	9
Pictou County Electric Co., Ltd.	2
Quebec Railway, Light & Power Co.	11
Toronto Transportation Commission	67
Windsor, Essex & Lake Shore Rapid Ry.	4
Winnipeg Electric Ry.	23
Woodstock, Thames Valley & Ingersoll Electric Ry.	3
Panama	
Panama Electric Co.	2
Porto Rico	
Ponce Electric Co.	4
Hawaii	
Honolulu Rapid Transit Co.	6
Total	7.749

Railroad and the Gary Railways; the Mid-State Coach Lines of the Auburn & Syracuse Electric Railroad, the Empire State Railroad and the Rochester & Syracuse Railroad. During the year, the Penn-Jersey Transit Company was organized by the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey, to furnish bus service over the recently completed Delaware River Bridge connecting the cities of Philadelphia and Camden.

Many Large Orders Placed During Year

In all 2,203 buses were bought in 1926. Of this number 231 vehicles were second hand.

Purchasers of new buses aggregated 1,972 during the year, only slightly less than the purchases made during 1925. Details of the individual orders are given in Table II. Additional orders totaling several hundred buses are under consideration at the present time, but details were not available when this issue went to press.

More than half of the electric railways engaged in the operation of automotive vehicles bought one or more buses during the year. The largest single purchaser was the Philadelphia Rapid Transit Company, which bought 163 buses. Second was the Department of Street Railways, City of Detroit, which ordered 142 new buses. Other large orders include 78 buses bought by the Boston Elevated Railway, 67 by the Cincinnati Street Railway, and 50 by the Miami Beach Railway. Public Service Railway of New Jersey added more than 300 buses to its equipment, but this increase included some vehicles bought second-hand from independent operators. The same was true in the case of the Virginia Electric & Power Company, which added 85 buses.

Of the large number of buses ordered in 1926, only 80 were double-decked vehicles. This is less than the number of double-deckers bought during either of the two preceding years. Detroit and Cleveland made the largest purchases of buses of this type. Others were bought by the Pacific Electric Railway, the Boston Elevated Railway, the Third Avenue Railway, New York City, and the Pittsburgh Railways. In the case of the last-mentioned property, two buses of the type operated by the London General Omnibus Company were imported from England for experimental purposes.

Table II—Buses Bought by Railways During 1926

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Connecticut					
Connecticut Co.	20	20	Yellow	Yellow	29
Danbury Power & Trans. Co.	10	10	Yellow	Yellow	21
Lordship Ry.	2	2	Graham	Graham	20
Maine					
York Utilities Co.	2	1	Yellow	Boston	13
		1	Yellow	....	..
Massachusetts					
Boston Elevated Ry.	78	5	International	Niagara	25
		30	Mack	Mack	29
		23	White	Brown	29
		15	Yellow	Yellow	29
		1	Six Wheel	Six Wheel	61
		1*	Mack	Mack	29
		3*	Yellow	Yellow	29
Boston & Worcester St. Ry.	12	7	....	Lang	..
		5	....	Brown	..
Eastern Massachusetts St. Ry.	11	6	Yellow	Yellow	21
		4*	Pierce	Pierce	27
		1*	White	White	23
Fitchburg & Leominster Street Ry.	2	2	Yellow	Yellow	29
Gardner-Templeton St. Ry.	3	2	Graham	Graham	20
		1	White	Bender	29
Middlesex & Boston St. Ry.	28	28	White	Bender	23—29
Plymouth & Brockton St. Ry.	2	1	Reo	Nickerson	25
		1*	Reo	Boston	20
Springfield Street Ry.	3	1	Yellow	Yellow	21
		2	Yellow	Yellow	29
Union Street Ry.	2	2	Yellow	Yellow	30
Worcester Consolidated St. Ry.	5	5	Yellow	Yellow	29
New Hampshire					
Dover, Somersworth & Rochester St. Ry.	6	6	White	Brown	29
Exeter, Hampton & Amesbury St. Ry.	5	..	....	....	..
Keene Electric Ry.	8	6	Graham	Graham	21
	2	2*	Ford	Ford	15
Laconia Street Ry.	5	..	....	....	..
Manchester & Derry St. Ry.	3	..	....	....	..
Portsmouth Electric Ry.	2	..	....	....	..
Rhode Island					
Newport Electric Corp.	2	2	Fageol	Fageol	29
Newport & Providence Ry.	2	2	White	Brown	21
United Electric Rys.	10	10	Yellow	Yellow	29
Vermont					
Burlington Traction Co.	1	1	Studebaker	Studebaker	21
District of Columbia					
Capital Traction Co.	3	2	Yellow	Yellow	21
		1	Yellow	Yellow	29
Washington Ry. & Elec. Co.	15	14	Yellow	Yellow	29
		1	Yellow	Yellow	21
Maryland					
Cumberland & Westernport Electric Ry.	1	1	White	Bender	29
Hagerstown & Frederick Ry.	15	15	International	International	18
United Railways & Elec. Co.	1	1	Studebaker	Studebaker	15
New Jersey					
Cumberland Traction Co.	6	6	Yellow	Yellow	29
Morris County Traction Co.	5	5	Fageol	Fageol	29
New Jersey Interurban Ry.	2	2	Yellow	Yellow	29
Public Service Ry.	111	61†	Yellow	Yellow	..
		50*	Yellow	Yellow	..
New York					
Cortland County Traction Co.	3	3	Brockway	Patterson	19
Fonda, Johnstown & Gloversville R.R.	1	1	Mack	Mack	25
International Ry.	25	21†	Yellow	Yellow	33
		4†	Yellow	Lang	26
Kingston Consolidated R.R.	5	5	Yellow	Yellow	29
New York State Rys. (Rochester)	19	8	White	Bender	29
		4	Mack	Bender	29
		1	Stewart	Caley-Nash	20
		1	White	Caley-Nash	20
		1	White	Bender	24
		1	Reo	Ontario	24
		1	White	N. Y. Rys.	21
		1	White	Caley-Nash	18
		1	Buick	Buick	7
New York State Rys. (Syracuse)	2	1	Mack	Bender	29
		1	White	Bender	29
New York State Rys. (Utica)	2	1	Mack	Bender	29
		1	White	N. Y. Rys.	18
Olean, Bradford & Salamanca Ry.	4	4	Fageol	Fageol	22
Peekskill Lighting & R.R. Co.	9	9	White	Bender	29
Third Avenue Ry.	5	3	Studebaker	Studebaker	21
		1	Graham	Graham	22
		1	Six Wheel	Six Wheel	59
United Traction Co of Albany	27	27†	Mack	Mack	27
Pennsylvania					
Altoona & Logan Valley Electric Ry.	9	2	White	White	25
		7	Yellow	Yellow	21
Bangor & Nazareth Transit Co.	3	2	International	Paterson	65
		1	International	Hoover	65
Bangor & Portland Transit Co.	2	2	Reo	Reo	20
Beaver Valley Traction Co.	7	5*	White	White	14
		1*	P. Arrow	P. Arrow	14
		1*	Safeway	Wolfington	29
Citizens Traction Co.	3	3	Yellow	Yellow	21
Conestoga Traction Co.	2	2	Mack	Mack	25
Erie Rys.	2	2	Yellow	Yellow	21
Johnstown Traction Co.	2	2	Yellow	Yellow	21
Lehigh Valley Transit Co.	11	6	Mack	Mack	29
		1*	Mack	Mack	29
		1*	Reo	Reo	21
		3	Yellow	Yellow	29
Lewistown & Reedsville Electric Ry.	1	1	White	Bender	29
Philadelphia Rapid Transit Co.	163	163†	Yellow	Yellow	..
Northwestern Electric Service Co.	2	..	....	....	..
Philadelphia & West Chester Traction Co.	16	15	Fageol	Fageol	29
		1	White	Kuhlman	29
Pittsburgh Rys.	19	5	Six Wheel	Thompson	29
		1	Six Wheel	Wolfington	27
		1	Six Wheel	Wolfington	29
		4	Mack	Mack	25
		2	L. G. O.	L. G. O.	52
		6	Yellow	Yellow	19
Schuylkill Ry.	3	3	Brockway	Paterson	22
Scranton Ry.	6	6	Fageol	Fageol	29
Shamokin & Edgewood Electric Ry.	3	1	Reo	Reo	21
		1	Reo	Paterson	21
		1	Paterson	Paterson	21
Southern Cambria Ry.	4	4	Reo	McKay	15
Stroudsburg Traction Co.	1	1	Garford	Garford	21
United Traction St. Ry.	2	2	Graham	Graham	21
West Chester Street Ry.	12	10	Yellow	Yellow	..
		2	Hahns	Hahns	..
West Penn Rys.	2	2	Yellow	Yellow	21
Westside Electric St. Ry.	1	1	Yellow	Yellow	21
Virginia					
Newport News & Hampton Ry., Gas & Electric Co.	1	1	Reo	Reo	21
Virginia Electric & Pwr. Co.	85	15	White	Bender	21
		18	White	Am. Car	29
		2	Yellow	Am. Car	29
		5	Reo	Fitzjohn	21
		5	White	Hoover	21
		10	Mack	Am. Car	29
		30*	Various types.		
West Virginia					
Charleston Interurban R.R.	15	6	Yellow	Yellow	25—30
		6	Yellow	Yellow	17—21
		3	Yellow	Yellow	21
Monongahela-West Penn Public Service Co.	4	4	Yellow	Yellow	21
Ohio Valley Electric Ry.	14	6	Graham	Graham	20
		1	White	White	25
		1	Denby	Denby	29
		4	Studebaker	Studebaker	21
		2	Studebaker	Studebaker	14
Wheeling Traction Co.	9	5	Studebaker	Studebaker	12
		4	Studebaker	Studebaker	7
Illinois					
Aurora, Elgin & Fox River Electric Co.	2	1	Fageol	Fageol	27
		1	Reo	Reo	21
Chicago & Joliet Elec. Ry.	3	2	Yellow	Yellow	29
		1	Yellow	Yellow	21
East St. Louis & Suburban Ry.	16	12	Yellow	Yellow	29
		1	White	Kuhlman	29
		1	Mack	St. Louis	29
		2	P. Arrow	Buffalo	29
Evanston Ry.	4	4	Yellow	Yellow	21
Illinois Power Co.	2	2	Yellow	Yellow	29
Illinois Power & Light Corp.	34	24	....	....	21
		7	....	....	25
		3	....	....	21
Rockford & Interurban Ry.	6	4	Yellow	Yellow	29
	..	2	Yellow	Yellow	21
Indiana					
Chicago, South Bend & Northern Ind. Ry.	5	5	Studebaker	Auto	21
Indianapolis Street Ry.	4	4	Yellow	Yellow	29
Indiana Service Corp.	23	6*	Fageol	Fageol	30
		3*	White	Bender	26
		1*	Fageol	Fageol	26
		1*	Studebaker	Fremont	15
		1*	Studebaker	Fremont	18
		4*	Studebaker	Clark	15
		2*	Studebaker	Miller	12
		3	International	Lang	24
		2	International	Lang	28
Shore Line Motor Coach Co.	53	..	....	....	..
		..	....	....	..
Southern Indiana Gas & Electric Co.	10	6	Graham	Graham	21
		4	Yellow	Yellow	29
Terre Haute, Indianapolis & Eastern Traction Co.	17	9*	Mack	Mack	..
		5*	Mack	Mack	..
		3	Fageol	Fageol	..

Table II—Buses Bought by Railways During 1926 (Continued)

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Union Traction Co. of Indiana	31	12	Mack	Mack	25
		4	Mack	Eckland	25
		5	Fageol	Fageol	29
		10	White	Kuhlman	25
Iowa					
Des Moines City Ry.	3	3	White	Bender	25
Fort Dodge, Des Moines & Southern R.R.	2	2	Yellow	Yellow	29
Iowa Southern Utilities Co. (Burlington)	4	4	Mack	Mack	26
Iowa Southern Utilities Co. (Ottumwa)	6	6	Mack	Mack	25
Tri-City Ry.	9	2†	Mack	Mack	25
		1	Mack	Mack	29
		6	Mack	Mack	21
Kentucky					
Kentucky Traction & Terminal Co.	20	11	Yellow	Yellow	21
		1*	U. S.	U. S.	15
		2*	Reo	Reo	19
		1*	Reo	Reo	15
		5*	Reo	Reo	14
Kentucky Utilities Co. (Paducah)	6	2*	Reo	Reo	21
		1*	Reo	Reo	19
		3	Yellow	Yellow	21
Michigan					
Department of Street Rys., Detroit	142	41*	Yellow	Yellow	29
		50†	Fageol	Amer. Car	60
		50	Graham	Graham	21
		1	Fageol	Amer. Car	60
Detroit United Ry.	14	12	Fageol	Fageol	27
		2	Graham	Graham	12
Menominee & Marinette Light & Traction Co.	1	1	Yellow	Yellow	21
Minnesota					
Duluth Street Ry.	1	1	White	Eckland	14
Twin City Rapid Transit Co.	11	7†	Yellow	Eckland	..
		1	Mack	Eckland	25
		3	White	Eckland	25
Missouri					
Springfield Traction Co.	4	3	Yellow	Yellow	21
		1	Graham	Graham	21
Ohio					
Cincinnati, Lawrenceburg & Aurora Electric St. R.R.	3	3*	Mack	Mack	25
Cincinnati Street Ry.	67	29	Mack	Bender	29
		18	Safeway	Kuhlman	29
		7	Schacht	Kuhlman	29
		13	Mack	Mack	29
Cleveland Ry.	51	30	White	Kuhlman	29
		20	Six Wheel	Six Wheel	62
		1	Six Wheel	Six Wheel	29
Cleveland Southwestern Ry. & Light Co.	3	3	White	Kuhlman	24
Columbus Railway, Power & Light Company	3	3†	Mack	Mack	11
Community Traction Co.	30	6	Mack	Mack	25
		12	Mack	Mack	29
		12	White	Kuhlman	29
Indiana, Columbus & Eastern Traction Co.	1	1	Fageol	Fageol	22
Nelsonville-Athens Electric Ry.	1	1	Reo	Reo	21
Northern Ohio Power & Light Co.	71	1	N.O.P. & L.	Kuhlman	29
		6	Mack	Mack	29
		16	Yellow	Yellow	29
		20	Six Wheel	Kuhlman	29
		2	Six Wheel	Hoover	59
		8	Six Wheel	Six Wheel	27
		5*	Mack	Mack	29
		5	Yellow	Lang	30
		5	Mack	Lang	29
		3*	Studebaker	Superior	19
Ohio Public Service Co.	3	2	Yellow	Yellow	21
		1*	Yellow	Yellow	21
Pennsylvania-Ohio Electric Co.	36	15	White	Bender	29
		13	Fageol	Fageol	29
		3	Fageol	Fageol	29
		5	Yellow	Yellow	25
Southern Ohio Public Service Co.	1	1	Studebaker	Cambridge	19
Youngstown & Suburban Ry.	2	2	Fageol	Fageol	22
Wisconsin					
Madison Rys.	4	4*	Stoughton	Stoughton	90
Milwaukee Electric Railway & Light Co.	20	3	Fageol	Fageol	26
		3	Yellow	Yellow	29
		14	Yellow	Yellow	29
Wisconsin Power & Light Co.	11	3	Yellow	Yellow	29
		3	Fageol	Fageol	29
		5	Menominee	Menominee	21
Wisconsin Public Service Corp.	5	3	Yellow	Yellow	21
		2	Reo	Reo	21
Wisconsin Traction, Light, Heat & Power Co.	7	7*	....	....	16—25
Arkansas					
Arkansas Power & Light Co.	2	2	Yellow	Yellow	21
Florida					
Key West Electric Co.	6	6	Yellow	Yellow	21
Miami Beach Ry.	50	36†	Fageol	Fageol	29
		14	Yellow	Yellow	21
Municipal Ry. of St. Petersburg	8	8	Yellow	Yellow	21
Georgia					
Columbus Electric & Power Co.	7	7	Studebaker	Gibraltar	21
Georgia Ry. & Power Co.	10	10	Yellow	Yellow	21
Louisiana					
New Orleans Public Service Inc.	14	14†	Fageol	St. Louis	29
Mississippi					
Mississippi Power Co., Gulfport	12	12	Mack	Mack	..
Mississippi Power & Light Co.	2	1	White	Bender	21
		1	Yellow	Yellow	21
North Carolina					
Carolina Power & Light Co.	7	7†	Fageol	Fageol	30
Durham Public Service Co.	6	2	Reo	Fitzjohn	21
		4	Yellow	Yellow	21
Southern Public Utilities Co.	5	5	Yellow	Yellow	21
Tennessee					
Nashville Interurban Ry.	9	8	International	Burkett	..
		1	International	Lang	15
Nashville Railway & Light Co.	13	13	Yellow	Yellow	29
California					
Bakersfield & Kern Electric Ry.	1	1	Studebaker	Studebaker	12
Key System Transit Co.	27	14	Fageol	Fageol	28
		5	Yellow	Amer. Car	28
		2	Yellow	Yellow	29
		3	Yellow	Yellow	21
		3	Reo	Reo	21
Los Angeles Ry.	35	3	Yellow	Yellow	21
		4	Yellow	Yellow	29
		8	Yellow	Yellow	63
		8	Fageol	Fageol	59
		1	Fageol	Fageol	21
		9	Fageol	Fageol	29
		1	White	White	25
		1†	Yellow	Yellow	29
Market Street Ry.	3	3	Fageol	Fageol	29
Municipal Railway of San Francisco	7	2	White	White	29
		2	Fageol	Fageol	29
		2	Mack	Mack	29
		1	Miscellaneous		
Pacific Electric Ry.	3	3	Fageol	Fageol	58
Pacific Gas & Electric Co.	1	1	Moreland	Moreland	16
San Diego Electric Ry.	3	3	Fageol	Fageol	29
Santa Barbara & Suburban Ry.	4	3	Mack	Mack	25
		1	Fageol	Fageol	29
Southern Pacific Co.	11	3	Mack	Mack	29
		8	White	Fischer	25
Union Traction Co., Santa Cruz	4	4	Reo	Reo	21
Colorado					
Colorado Springs & Interurban Ry.	6	6	Yellow	Yellow	21
Denver Tramway	1	1	Yellow	Yellow	21
Denver & South Platte Ry.	2	2	Graham	Graham	21
Idaho					
Boise Street Car Co.	4	4	....	....	..
Kansas					
Arkansas Valley Interurban Ry.	1	1	Studebaker	Studebaker	14
Kansas City, Leavenworth & Western Ry.	1	1	Mack	Mack	25
Montana					
Butte Electric Ry.	3	2	Fageol	Fageol	29
		1	P. Arrow	Brown	29
Nebraska					
Lincoln Traction Co.	14	12	Mack	Mack	25
		2	Studebaker	Studebaker	21
Omaha & Council Bluffs Street Ry.	3	3	Douglas	Weir	21
Omaha, Lincoln & Beatrice Ry.	3	3	White	Bender	21
North Dakota					
Northern States Power Co.	2	2	Reo	Reo	21
Oklahoma					
Oklahoma Ry.	9	4	Yellow	Yellow	21
		5	Reo	Reo	21
Oklahoma Union Ry.	49	17	Reo	Reo	21
		13	Mack	Mack	25
		16	Graham	Graham	15
		1	Studebaker	Studebaker	15
		1	International	International	15
		1	Buick	Buick	12
Tulsa Street Ry.	3	3	Yellow	Yellow	21
Oregon					
Portland Electric Power Co.	9	7	Yellow	Yellow	33
		1	Mack	Mack	29
		1	Yellow	Yellow	29
South Dakota					
Sioux Fall Traction System.	2	1	Garford	Garford	15
		1	White	Eckland	19
Texas					
Austin Street Ry.	1	1	Yellow	Yellow	21
Dallas Ry. & Terminal Co.	7	7	Graham	Graham	21
Eastern Texas Electric Co.	4	4	Graham	Graham	21
El Paso Electric Co.	3	2	Studebaker	Miller	21
		1	Yellow	Yellow	21

Table II—Buses Bought by Railways During 1926 (Concluded)

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Galveston Electric Co.	4	3	Studebaker	Studebaker	16
		1	Yellow	Yellow	17
Houston Electric Co.	15	2	Mack	McKay	29
		4	Yellow	Yellow	21
		1	Yellow	Yellow	27
		3	Reo	International	15
		2	Yellow	Yellow	33
		2	Yellow	Yellow	29
		1*	Studebaker	Gilbraltar	21
Northern Texas Traction Co	4	2	Yellow	Yellow	21
		2	Reo	Fitzjohn	21
San Antonio Public Service Co.	14	1	Studebaker	Gilbraltar	22
		3	Reo	Fitzjohn	21
		1	P. Arrow	Bender	29
		9	Yellow	Yellow	21
Southwestern Traction Co.	3	1	Graham	Graham	12
		2	Hudson	Hudson	7
Wichita Falls Traction Co.	8	4	Reo	Reo	20
		4	Graham	Graham	20
Utah					
Bamberger Electric R.R.	2	2	Yellow	Yellow	25—29
Utah Idaho Central R.R.	2	1	Fageol	Fageol	25
		1	Mack	Mack	29
Utah Light & Traction Co.	2	2	Mack	Duralyte	29
Washington					
Puget Sound Power & Light Co.	24	2	Fageol	Fageol	..
		1	Yellow	Yellow	17—21
		5*	Pierce	Local	23
		4*	Fageol	Fageol	22
		2*	White	Local	14—22
		1*	Fageol	Fageol	27
		1*	Yellow	Yellow	17—21
		2*	Fageol	Fageol	19
		3*	Fageol	Fageol	25
		3*	Fageol	Fageol	20
Seattle Municipal Ry.	14	5	Reo	Fitzjohn	21
		5	Garford	Garford	21
		2	White	Ry. Co.	29
		2	Garford	Ry. Co.	29
Yakima Valley Transportation Co.	2	2	Mack	Mack	29
Canada					
British Columbia Electric Ry., Ltd.	3	3	Fageol	Fageol	33
Hamilton Street Ry.	10	10	Yellow	Nat. Steel	21
London Street Ry.	6	6	Yellow	Yellow	21
Montreal Tramways.	31	19	Yellow	Yellow	29
		6	Yellow	Yellow	21
		6	Reo	Ottawa	21
Ottawa Electric Ry.	5	4	Reo	Ottawa	21
		1	Reo	Ottawa	22
Pictou County Electric Co., Ltd.	2	2	International	International	20
Toronto Transportation Commission	24	10	Yellow	Yellow	29
		9	Yellow	T. T. C.	29
		5	Yellow	Yellow	21
Windsor, Essex & Lake Shore Rapid Ry.	2	2	Gotfredson	Gotfredson	25
Winnipeg Electric Co.	4	3	Reo	Reo	21
		1	Studebaker	Studebaker	..
Woodstock, Thames Valley & Ingersoll Electric Ry.	1	..	....	....	..
Porto Rico					
Ponce Electric Co.	1	1	Reo	Fitzjohn	22
Total	2,203				

*Second-hand.
† Gas-electric.

Table III—Bus Route Extensions During 1926

Name of Railway	City Miles	Intercity Miles	Replaced Miles
Connecticut			
Connecticut Co.	14.63	12.79	1.76
Lordship Ry.	.....	3.70	.....
Massachusetts			
Boston Elevated Ry.	11.16	.....	8.61
Boston & Worcester Street Ry	6.00	14.00	6.00
Eastern Massachusetts Street Ry.	0.60	18.31	15.40
Gardner-Templeton Street Ry.	.....	10.00	10.00
Middlesex & Boston Street Ry.	.....	29.39	.....
Springfield Street Ry.	.....	15.50	17.00
Union Street Ry.	2.10	.....	.....
Worcester Consolidated Street Ry.	.....	5.30	5.30
New Hampshire			
Keene Electric Ry.	12.00	5.00	.....
Manchester & Derry Street Ry.	.....	8.37	.....
Rhode Island			
Newport & Providence Ry.	1.50	.....	1.50
Vermont			
Burlington Traction Co.	0.33	.....	.....
District of Columbia			
Capital Traction Co.	.....	8.00a	.....
Washington Railway & Electric Co.	6.36	.....	.....
New York			
Fonda, Johnstown & Gloversville R.R.	.....	37.00	.....
International Ry.	.....	13.83	.....
Kingston Consolidated R.R.	7.00	.....	3.00
New York State Rys.	4.20	.....	1.35
Olean, Bradford & Salamanca Ry.	.....	9.00	9.00
United Traction Co. of Albany.	6.52	.....	6.63
Pennsylvania			
Citizens Traction Co.	2.85	.....	2.85
Conestoga Traction Co.	3.20	.....	.....
Erie Rys.	4.50	.....	.....
Lehigh Valley Transit Co.	2.18	13.64	11.90
Philadelphia & West Chester Traction Co.	.....	18.00	.....
Shamokin & Edgewood Electric Ry.	4.00	.....	.....
Southern Cambria Ry.	.....	39.50	.....
West Penn Rys	0.76	.....	.....
Westside Electric Street Ry.	3.00	7.00	.....
West Virginia			
Charleston Interurban R.R.	4.00	.....	.....
Wheeling Traction Co.	.....	57.00	.....
Illinois			
Chicago, North Shore & Milwaukee R.R.	1.60	48.50b	.....
Chicago & West Towns Ry.	2.50	.....	.....
East St. Louis & Suburban Ry	5.66	72.20	2.90
Evanston Ry	8.00	.....	.....
Chicago & Joliet Electric Ry.	7.00	.....	.....
Illinois Power Co.	4.68	.....	.....
Illinois Power & Light Corp.	75.00	.....	.....
Indiana			
Chicago, South Bend & Northern Indiana Ry.	4.20	.....	.....
Indianapolis Street Ry.	6.06	.....	.....
Southern Indiana Gas & Electric Co.	7.00	.....	.....
Terre Haute, Indianapolis & Eastern Trac. Co.	13.17	148.00	.....
Union Traction Co. of Indiana.	10.05	81.40	3.60
Iowa			
Des Moines City Ry	7.48	.....	.....
Iowa Southern Utilities Co.	7.75	.....	8.00
Tri City Railway.	4.80	.....	.....
Kentucky			
Kentucky Traction & Terminal Co.	7.70	.....	.....
Louisville Ry.	3.10	.....	.....
Michigan			
Department of Street Rys., Detroit	109.97	.....	.....
Grand Rapids Ry.	0.80	.....	.....
Minnesota			
Duluth Street Ry.	3.28	.....	.....
Twin City Rapid Transit Co.	15.30	12.00	.....
Missouri			
Springfield Traction Co.	3.40	.....	3.40
United Rys.	2.81	1.09	.....
Ohio			
Cincinnati Street Ry.	69.75	.....	1.80
Cleveland Ry.	24.16	.....	1.10
Cleveland Southwestern Railway & Light Co.	.....	10.30	10.30
Columbus, Urbana & Western Electric Ry.	.....	7.50	7.50
Community Traction Co.	15.22	.....	4.59
Indiana, Columbus & Eastern Traction Co.	.....	55.00	.....
Nelsonville-Athens Electric Ry.	5.00	.....	.....
Northern Ohio Power & Light Co.	15.49	.....	1.49
Pennsylvania-Ohio Electric Co.	4.00	181.00	.....
Wisconsin			
Madison Rys.	3.75	.....	0.75
Wisconsin Power & Light Co.	9.65	35.00	1.20
Wisconsin Public Service Corp.	0.68	6.00	6.00
Florida			
Key West Electric Co	2.66	.....	2.70
Miami Beach Ry.	36.00	.....	.....
Georgia			
Columbus Electric & Power Co.	4.10	.....	3.60
Georgia Railway & Power Co.	.....	4.42c	.....
Louisiana			
Baton Rouge Electric Co.	1.00	.....	.....
New Orleans Public Service, Inc.	8.30	.....	.....
Mississippi			
Mississippi Power Co., Gulfport.	.....	31.00	22.50
North Carolina			
Carolina Power & Light Co.	8.60	.....	.....
Durham Public Service Co.	2.13	.....	.....
Tennessee			
Nashville Interurban Ry	.....	192.00	.....
Tennessee Electric Power Co.	7.30	.....	.....
Arizona			
Tucson Rapid Transit Co.	5.00	.....	.....
California			
Bakersfield & Kern Electric Ry.	0.50	.....	.....
Key System Transit Co.	3.96	.....	.....
Los Angeles Ry.	13.96	.....	.....

Table III—Bus Route Extensions During 1926 (Concluded)

Name of Railway	City Miles	Intercity Miles	Replaced Miles
Market Street Ry	3.86	.....	.....
Pacific Electric Ry	4.50	.....	.....
San Diego Electric Ry	2.00	.....	.....
Union Traction Co.	3.50	.....	3.50
Colorado			
Colorado Springs & Interurban Ry	5.00	30.00a	2.53
Denver & South Platte Ry	.....	4.50	4.25
Idaho			
Boise Street Car Co.	5.50	.....	.....
Nebraska			
Omaha & Council Bluffs Street Ry	2.02	.....	.....
Omaha, Lincoln & Beatrice Ry	.....	5.50	0.63
North Dakota			
Northern States Power Co	3.00	.....	.....
Oklahoma			
Northeast Oklahoma Ry.	.....	9.33	.....
Oklahoma Ry.	6.70	.....	.....
Oklahoma Union Ry	.....	18.00	.....
Tulsa Street Ry.	1.70	.....	.....
South Dakota			
Sioux Falls Traction System	.....	90.00	.....
Texas			
Austin Street Ry	4.38	.....	.....
Dallas Railway & Terminal Co	6.88	.....	.....
Eastern Texas Electric Co.	9.00	.....	.....
Galveston Electric Co.	.....	36.00d	.....
Galveston-Houston Electric Co.	12.80	.....	.....
Houston Electric Co.	27.25	30.00a	.....
Northern Texas Traction Co.	3.20	.....	.....
San Antonio Public Service Co.	14.60	.....	3.39
Southwestern Traction Co.	10.50	.....	10.50
Utah			
Utan Idaho Central R.R.	.....	27.00	.....
Utah Light & Traction Co	.....	7.50	8.74
Washington			
Puget Sound Power & Light Co.	.....	216.50	.....
Seattle Municipal Ry.	6.25	.....	.....
Southern Pacific R.R.	4.80	1.90	.....
Yakima Valley Transportation Co.	3.10	.....	.....
Canada			
Hamilton Street Ry.	7.00	.....	.....
Hydro-Electric Railways	10.36	.....	.....
London Street Ry.	6.85	.....	0.50
Montreal Tramways	22.45	.....	.....
Toronto Transportation Commission	3.30	83.00	.....
Windsor, Essex & Lake Shore Rapid Ry	.....	50.00	.....
Winnipeg Electric Co.	1.75	.....	.....
Total	841.66	1,827.17	215.17

a—Sightseeing.
b—Does not include sightseeing.
c—1.62 mi sightseeing included.
d—20.00 mi. sightseeing included.

Gas-electric buses to the number of about 396 were ordered by electric railways during the year just ended. This number was somewhat larger than the number for the preceding year, when orders totaled approximately 370. Moreover, the distribution of railways ordering gas-electrics was wider. Important purchases during the year include 163 gas-electrics for the Philadelphia Rapid Transit Company, 61 for the Public Service Railway, 50 for the Department of Street Railways, City of Detroit; 36 for the Miami Beach Railway; eighteen for the International Railway, Buffalo, and fourteen for the New Orleans Public Service, Inc.

Of the new buses ordered during the year about one-half had seating capacities from 27 to 30, inclusive. This was by far the most popular size. Medium-sized buses ranging in seating capacity from 19 to 21 numbered about 500. Small buses of seating capacities from 13 to 16 were few in number. Those over 30, not including the double-deck buses with seating capacities from 50 to 65, were also comparatively few. Various other odd sizes were included in the list.

In addition to the new buses ordered from manufacturers during the year, the electric railways have acquired more than 200 buses by purchase of lines already existing. In many cases the equipment thus acquired has been retired from service and new vehicles purchased. In other instances, while the old equipment remains in operation it is planned to replace it at the earliest practicable moment. An outstanding feature of the survey this year is the number of buses junked. Altogether 47 electric railways report approximately 160 buses retired from service.

NEW ROUTES ARE EXTENSIONS RATHER THAN REPLACEMENTS

Much new bus route mileage was added during the year. In all 116 companies report bus route extensions totaling about 2,650 miles on which regular service is given. Besides that there have been about 60 miles of extensions to sightseeing routes. Replacement of rail service by bus service has occurred on only 215 miles of route, or less than 9 per cent of the route mileage added during the year.

Adding the figures for 1926 to those for preceding years, it is found that approximately 100 railways have replaced cars by buses on parts of their systems. Rail service on approximately 940 miles of track has been superseded by bus service. Some 25 electric railways having about 450 miles of track have suspended rail service altogether and now operate only buses. An additional 75 railways with 900 miles of track have suspended all service and a certain measure of transportation service is now furnished by buses under different management. Thus the bus has replaced the car on a total of 2,300 miles of track. The bus routes operated by electric railways total more than 15,000 miles. From this it will be seen that replacement of rail service has been a minor factor in the expansion of bus service.

AUTOMOTIVE SERVICE EQUIPMENT ORDERS LARGEST IN RECENT YEARS

Together with the large purchases of buses already mentioned, electric railways in 1926 ordered 347 automotive vehicles of various kinds for other than passenger-carrying purposes. This was a substantial increase over the figure of 284 automotive service vehicles bought in 1925. In 1924 such purchases amounted to 105, in 1923 they were 148, and 112 in 1922.

Trucks for miscellaneous haulage purposes were the most numerous. Seventeen freight and express trucks and ten tractors were ordered, and a considerable number of line and tower trucks also were bought. An interesting commentary on the development of bus operation by electric railways is found in the number of automotive snow plows ordered. Four companies ordered eleven such vehicles. Two tank trucks were purchased for use in conjunction with buses. In size the service equipment ranged from ½ ton to 14½ tons. The most popular size was the 1-ton truck, with 2½-ton and 5-ton sizes about even for second place in popularity.

The largest single purchaser of automotive service equipment was the Boston Elevated Railway, which ordered 95 trucks of various types. Other large orders included the Chicago, North Shore & Milwaukee Railroad, 22; Brooklyn City Railroad, 21; Brooklyn-Manhattan Transit Corporation, 20; Key System Transit Company, 18, and Toronto Transportation Commission, 15. Altogether 53 electric railways reported such orders.

No trackless trolleys were reported as having been ordered by electric railways in the year just ended.

Fewer Electric Railways in Receivership

Mileage of Properties Defaulting Have Little More than Half the Mileage of Those Included in 1925 Record—Even Including Chicago Railways the Total Is Reduced—Twenty Companies Emerged from Receivership and Nine Others Were Foreclosed and Should Come Out in 1927

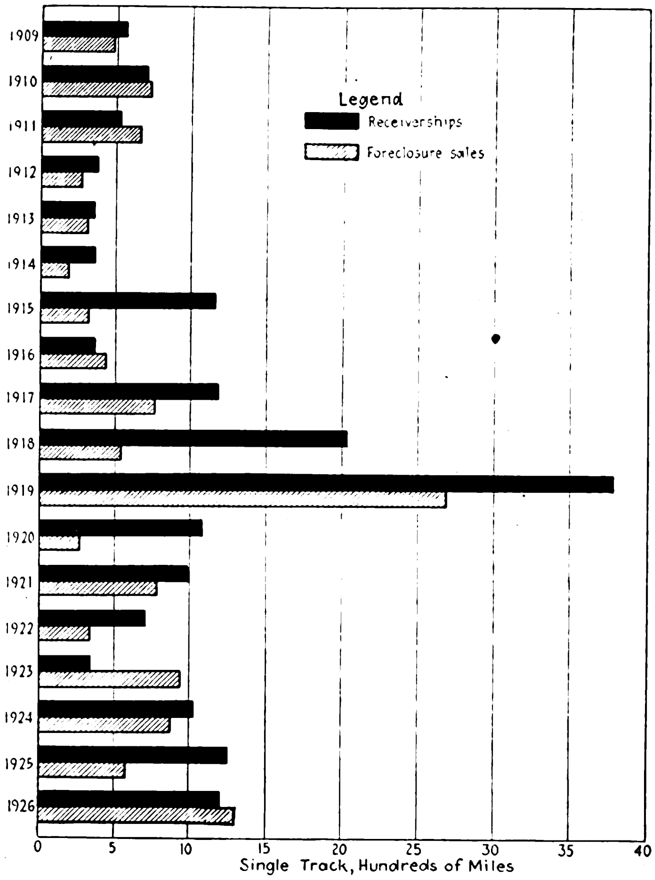
WITH the passing of another year electric railways in receivership are still on the wane, the number having been decreased in 1926 to 55 companies. Twenty companies, comprising 1,060 miles of track, emerged from receivership and twelve others were sold at foreclosure and may be expected to emerge in 1927. Railways going into receivership in 1926 as a result of financial difficulties comprise a total of about 640 miles, or 620 miles less than in 1925.

The Chicago Railways, with 590 miles of track, is not included in the above figures, as the receivership in this instance is in no way attributable to the financial results of operation. This was a voluntary receivership to conserve the property at the expiration of a franchise. The property is physically in fine condition and has broken all former traffic and revenue records. The increase in gross revenue and passengers carried for 1926 ran better than 4 per cent above 1925, and public relations are more satisfactory than at any time in the company's history. A complete summary of this situation was published in the Dec. 25, 1926, issue of ELECTRIC RAILWAY JOURNAL, page 1124.

Table I—Electric Railway Receiverships—1926

	Miles of Single Track Involved	Outstanding Securities Stock	Bonds	Receivers' Certificates
Milford & Uxbridge Street Ry., Milford, Mass.	35.00	$540,000	$500,000	None
Geneva, Seneca Falls & Auburn R.R., Geneva, N. Y.	12.00	157,100	507,000	None
Olean, Bradford & Salamanca Ry., Olean, N. Y.	100.00	3,808,000	472,818	None
Northern Cambria Ry., Patton, Pa.	13.00	250,000	250,000	None
Chicago Rys., Chicago, Ill.	591.16	100,000	103,228,255	None
Rockford, Beloit & Janesville Ry., Rockford, Ill.	(a)	(a)	907,000	None
Rockford City Traction Co., Rockford, Ill.	(a) 36.17	(a)	(a)	None
Rockford & Interurban Ry., Rockford, Ill.	76.00	4,000,000	2,175,500	None
Kankakee & Urbana Traction Co., Urbana, Ill.	26.00	(b)	(b)	(b)
Mississippi Valley Electric Co., Iowa City, Iowa	9.00	592,835	184,500	$2,000
Grand Rapids, Grand Haven & Muskegon Ry., Grand Rapids, Mich.	44.09	1,200,000	1,500,000	None
Minneapolis, Anoka & Cuyuna Range Ry., Minneapolis, Minn.	18.23	300,000	380,000	None
Southwest Missouri R.R., Webb City, Mo.	90.00	5,000,000	2,341,000	None
Sharon & Newcastle Street Ry., Youngstown, Ohio	17.00	120,000	120,000	None
Denver & Interurban R.R., Denver, Colo.	45.63	101,500	1,079,000	None
Utah Idaho Central R.R., Ogden, Utah	115.00	1,600,000	3,913,000	None
Total for 1926 (16 Cos)	1,228.28	17,769,435	117,558,073	2,000

(a) Included with Rockford & Interurban Ry.
(b) Information not available.



Number of Companies Entering Receivership During 1926 Was Slightly Less Than In The Previous Year Although Foreclosure Sales More Than Doubled

Table II—Record of Electric Railway Receiverships

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities Stock	Bonds
1909	22	558.00	$29,962,200	$22,375,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	321,259,354	312,915,104
1920	19	1,065.31	28,758,455	72,283,575
1921	19	986.42	32,909,525	36,177,800
1922	14	695.43	18,140,150	20,304,400
1923	12	333.63	8,332,100	14,707,066
1924	12	1,021.88	28,489,700	35,716,000
1925	14	1,260.07	51,383,195	54,696,525
1926	16	1,228.28	17,769,435	117,560,073

Table III—Record of Electric Railway Foreclosure Sales

Year	Number of Companies	Miles of Track Involved	Outstanding Securities Stocks	Bonds	Receivers' Certificates
1909	21	488.00	$22,265,700	$21,174,000	(a)
1910	22	724.36	19,106,613	26,374,075	(a)
1911	25	660.72	91,354,800	115,092,750	(a)
1912	18	267.18	14,197,300	10,685,250	(a)
1913	17	302.28	15,243,700	19,094,500	(a)
1914	11	181.26	26,239,700	44,094,241	(a)
1915	19	308.31	30,508,817	16,759,997	(a)
1916	19	430.14	13,895,400	22,702,300	(a)
1917	26	745.19	27,281,900	27,313,045	(a)
1918	23	524.22	37,740,325	20,149,384	(a)
1919	29	2,675.48	89,893,400	79,836,738	$42,300
1920	13	259.90	7,782,400	11,227,328	52,000
1921	13	777.97	33,642,255	30,863,526	5,000
1922	13	322.88	7,491,500	12,640,600	114,683
1923	15	927.45	118,077,959	110,638,250	12,265,000
1924	14	869.25	21,022,800	34,845,535	3,440,388
1925	13	569.39	18,074,300	18,329,555	53,000
1926	28	1,291.17	20,054,700	57,340,363	214,000

(a) Data not available.

Table IV—Electric Railway Receiverships as of Dec. 31, 1926

	Year of Receivership	Miles of Single Track	Outstanding Securities		
			Capital Stock	Funded Debt	Receivers' Certificates
New England States					
CONNECTICUT					
Hartford & Springfield Street Ry., Warehouse Point	1918	48.00	$785,000	$961,000	None
MASSACHUSETTS					
Boston & Worcester Street Ry., Framingham	1925	83.00	2,482,200	2,520,000	None
Milford & Uxbridge Street Ry., Milford	1925	35.00	540,000	500,000	None
Milford, Attleboro & Woonsocket Street Ry., Springfield (1)	1924	29.73	315,000	300,000	None
NEW HAMPSHIRE					
Portsmouth, Dover & York Street Ry., Portsmouth (1)	1917	12.00	....	707,000	$30,000
Net receiverships Dec. 31, 1926, (5 Cos.)		207.73	4,122,200	4,988,000	30,000
Eastern States					
DISTRICT OF COLUMBIA					
Washington-Virginia Ry	1923	40.00	2,378,300	5,614,000	None
NEW JERSEY					
Morris County Traction Co., Morristown	1923	68.98	300,000	4,179,000	None
NEW YORK					
Binghamton Ry., Binghamton	1925	49.52	978,895	2,807,200	None
Brooklyn Heights R.R., Brooklyn	1919	5.10	200,000	250,000	None
Buffalo & Lackawanna Traction Co., Buffalo	1918	8.80	55,000	1,000,000	None
Hamburg Ry., Buffalo	1920	21.72	None	750,000	$27,000
Geneva, Seneca Falls & Auburn R.R., Geneva	1926	12.00	157,100	507,000	None
Ithaca Traction Corporation, Ithaca	1924	11.62	400,000	763,000	None
Long Island Electric Ry., Jackson Heights (2)	1924	24.97	600,000	600,000	None
New York & Queens County Ry., Jackson Heights	1923	34.98	3,235,000	1,500,000	None
Manhattan & Queens Traction Corp., Long Island City	1917	21.66	20,000	25,946	None
Second Avenue R.R., New York	1908	23.96	1,862,000	5,682,000	$3,140,000
Staten Island Midland Ry., New York	1920	28.68	1,000,000	1,000,000	3,000
Steinway Railway, New York	1922	31.11	None	1,500,000	None
Westchester Street Ry. (3)	1920	17.92	700,000	168,000	None
Ogdensburg Street Ry., Ogdensburg	1922	7.74	150,000	150,000	None
Olean, Bradford & Salamanca Ry., Olean	1926	100.00	3,808,000	472,818	None
Penn Yan & Lake Shore Ry., Penn Yan	1918	8.50	94,000	100,000	None
Net receiverships Dec. 31, 1926, (18 Cos.)		517.26	15,938,295	27,068,964	3,170,000
Central States					
ILLINOIS					
Chicago & Interurban Traction Co., Chicago	1922	50.00	1,000,000	1,816,000	None
Chicago Rys., Chicago	1926	591.16	100,000	103,228,255	None
Peoria Railway Terminal Co., Peoria (4)	1922	25.28	1,000,000	2,444,000	None
Rockford, Beloit & Janesville Ry., Rockford	1926	(7)	(7)	907,000	None
Rockford City Traction Co., Rockford	1926	36.17	(7)	(7)	None
Rockford & Interurban Ry., Rockford	1926	76.00	4,000,000	2,175,500	None
INDIANA					
Union Traction Co. of Indiana, Anderson	1924	447.20	11,500,000	15,197,000	None
Indianapolis & Cincinnati Traction Co., Indianapolis	1925	101.00	3,600,000	2,400,000	112,000
IOWA					
Mississippi Valley Electric Co., Iowa City	1926	9.00	592,835	184,500	$2,000
KENTUCKY					
Owensboro City R.R., Owensboro	1923	12.50	75,000	400,000	None
MICHIGAN					
Detroit United Ry., Detroit	1925	613.89	15,375,000	29,745,500	None
Grand Rapids, Grand Haven & Muskegon Ry., Grand Rapids	1926	44.09	1,200,000	1,500,000	None
Houghton County Traction Co., Houghton	1921	32.15	957,200	660,000	None
Michigan Railroad, Jackson	1924	173.84	4,000,000	8,050,000	None
MINNESOTA					
Wahpeton-Breckenridge Street Ry., Breckenridge (5)	1925	1.00	42,500	None	None
St. Paul Southern Electric Ry., Hastings	1918	17.54	658,225	425,400	None
Minneapolis, Anoka & Cuyuna Range Ry., Minneapolis (4)	1926	18.23	300,000	380,000	None
Mesaba Railway, Virginia	1924	38.00	2,260,000	1,581,000	None
MISSOURI					
Kansas City, Lawrence & Topeka Electric Ry., Kansas City	1919	12.00	250,000	400,000	None
Missouri Electric R.R., St. Louis	1919	20.97	1,000,000	700,000	None
United Railways Co. of St. Louis	1919	462.88	41,296,000	52,590,000	None
Southwestern Missouri R.R., Webb City	1926	90.00	5,000,000	2,341,000	None
OHIO					
Cincinnati, Lawrenceburg & Aurora Electric Street R.R., Cincinnati	1913	31.67	808,900	750,000	None
Indiana, Columbus & Eastern Traction Co., Springfield	1921	201.49	4,025,000	7,900,000	$200,000
Sharon & New Castle St., Ry., Youngstown (6)	1926	17.00	120,000	120,000	None
Net receiverships Dec. 31, 1926 (25 Cos.)		3,123.06	99,160,660	235,895,155	314,000
Western States					
COLORADO					
Denver & Interurban R.R., Denver	1926	45.63	101,500	1,079,000	None
KANSAS					
Kansas City, Kaw Valley & Western Ry., Bonner Springs	1924	42.31	740,500	1,374,500	None
Joplin & Pittsburg Ry., Pittsburg	1924	94.52	7,000,000	3,078,500	None
MONTANA					
Helena Light & Railway Co., Helena (4)	1925	18.50	935,000	878,000	None
OKLAHOMA					
Oklahoma Railway, Oklahoma City	1924	138.45	5,595,900	5,815,000	None
Tulsa Street Ry., Tulsa	1925	23.00	580,000	771,000	None
UTAH					
Salt Lake City & Utah R.R., Salt Lake City	1925	96.71	5,043,700	2,611,292	100,000
Net receiverships Dec. 31, 1926 (7 Cos.)		459.12	19,996,600	15,607,292	100,000
Recapitulation for United States					
Net receiverships Dec. 31, 1926 (55 Cos.)		4,307.17	139,217,755	283,559,411	3,614,000

(1) All the property has been sold and assets being distributed. Receiver not yet discharged.

(2) Sold at foreclosure sale and now being operated by the Jamaica Central Rys. Receiver not yet discharged.

(3) Sold at foreclosure sale to the Third Avenue Ry. Receiver not yet discharged.

(4) Sold at foreclosure sale.

(5) Operations abandoned in 1925. Receiver not yet discharged.

(6) Operations abandoned.

(7) Included in Rockford & Interurban Ry. figures.

Thus taking as a measure of the industry's condition only those railways involved in financial difficulties, there are 15 new companies which went into receivership in 1926. These represent $17,769,435 capital stock and $14,329,818 bonds, or about one-fourth the value of stocks and bonds involved last year.

Including the Chicago Railways, the total of the 1926 receiverships is 1,228.28 miles, or slightly less than that in 1925; capital stock $17,769,435, only a little more than one-third the amount of capital involved in last year's figures. Also, the companies terminating receivership in 1926 exceed those of 1925 by about 150 miles.

Reorganization of the Kansas City Railways was consummated this year, the property now being operated as the Kansas City Public Service Company. Besides the Chicago Railways, this leaves only one large city property in receivership, the United Railways of St. Louis. Plans are now being perfected for termination of receivership of this property. The St. Louis Public Service Company was organized and stands ready to take over operation of the St. Louis properties as soon as a satisfactory franchise can be worked out.

The Utah-Idaho Central Railroad, which went into receivership Aug. 20, 1926, was sold at receiver's sale on Nov. 5 to a committee representing 99 per cent of the outstanding mortgage holders and the receivership was terminated.

On March 8, 1926, the Cincinnati & Dayton Traction Company receivership was ended, and immediately following acquisition of the property by the reorganized company, the Cincinnati, Hamilton & Dayton Railway, an extensive improvement program was inaugurated.

The property of the Dayton, Springfield & Xenia Southern Railway was taken over on Aug. 1 by the Dayton-Xenia Railway, organized for that purpose.

Two companies, the St. Louis & Alton Railway, with $1,000,000 capital stock, and the Alton Railway, with $750,000, were organized to take over and operate the Alton, Granite & St. Louis Traction Company, receivership of which was terminated.

The Cumberland & Westernport Transit Company was organized to take over the property of the Cumberland & Westernport Electric Railway and receiver discharged Oct. 1.

The Grand Rapids, Holland & Chi-

Table V—Receiverships Terminated and Foreclosure Sales During 1926

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track	Outstanding Securities: Stocks	Outstanding Securities: Bonds	Outstanding Securities: Receivers' Certificates	
Danbury & Bethel Street Ry., Danbury, Conn.	13.00	$320,000	$588,500	$100,000	Sold at foreclosure sale and reorganized as the Danbury Power & Transportation Co.
Connecticut Valley Street Ry., Greenfield, Mass.	47.05	621,000	580,000	None	Property liquidated.
Laconia Street Ry., Laconia, N. H.	8.00	140,000	91,000	None	Property dismantled.
Barre & Montpelier Traction & Power Co., Montpelier, Vt.	9.75	50,000	None	None	Sold at foreclosure sale to Vergennes Power Co.
Cumberland & Westernport Electric Ry., Frostburg, Md.	25.00	625,000	655,000	None	Sold at foreclosure sale and reorganized as the Cumberland & Westernport Transit Co.
North Jersey Rapid Transit Co., Hohokus, N. J.	18.00	800,000	800,000	None	Sold to Public Service Ry., Newark, N. J.
Hornell Traction Co., Hornell, N. Y.	10.90	117,900	150,000	None	Sold at foreclosure sale, operation abandoned and bus service substituted.
New York & Long Island Trac. Co., Jackson Heights, N. Y.	52.62	1,000,000	1,000,000	None	Sold at foreclosure sale and operations abandoned.
North Branch Transit Co., Bloomsburg, Pa.	30.00	500,000	532,500	45,000	Sold at foreclosure sale in 1925. Property taken over by North Branch Bus Co., railway service abandoned and buses substituted.
Northern Cambria Ry., Patton, Pa.	13.00	250,000	250,000	None	Sold at foreclosure sale and property dismantled.
Alton, Granite & St. Louis Trac. Co., East St. Louis, Ill.	62.00	3,189,000	3,000,000	None	Sold at foreclosure sale and reorganized as the Alton Railway and the St. Louis & Alton Ry.
Kankakee & Urbana Traction Co., Urbana, Ill.	26.00	(a)	(a)	(a)	Sold at foreclosure sale and property now being dismantled.
Fort Wayne, Van Wert & Lima Trac. Co., Fort Wayne, Ind.	61.63	1,000,000	1,470,000	None	Sold at foreclosure sale and reorganized.
Grand Rapids, Holland & Chicago Ry., Jackson, Mich.	80.93	1,324,700	1,500,000	21,000	Property sold in receivership sale and operations abandoned.
Kansas City Rys., Kansas City, Mo.	317.84	100,000	29,957,800	None	Sold at foreclosure sale and reorganized as the Kansas City Public Service Co.
Dayton, Covington, & Piqua Trac. Co., West Milton, Ohio	34.00	1,150,000	550,000	18,000	Sold at foreclosure sale and operations abandoned.
Dayton, Springfield & Xenia Southern Ry., Dayton, Ohio.	27.97	250,000	250,000	None	Sold at foreclosure sale and reorganized as the Dayton-Xenia Ry.
Cincinnati & Dayton Traction Co., Hamilton, Ohio	91.07	1,250,000	3,250,000	None	Sold at foreclosure sale and reorganized as the Cincinnati, Hamilton & Dayton Ry.
Hocking-Sunday Creek Traction Co., Nelsonville, Ohio	14.99	223,000	300,000	None	Sold at foreclosure sale in 1925 and reorganized as the Nelsonville-Athens Electric Ry. Receiver discharged this year.
Utah Idaho Central Railroad Co., Ogden, Utah	115.00	160,000	3,913,000	None	Sold at receiver's sale and receivership terminated.
Total of receiverships terminated (20 cos.)	1,058.75	13,070,600	48,837,800	184,000	
Sold at Foreclosure Sale But Receiver Not Yet Discharged					
Milford, Attleboro & Woonsocket Street Ry., Milford, Mass.	29.73	315,000	300,000	None	Assets being distributed.
Portsmouth, Dover & York Street Ry., Portsmouth, N. H.	12.00	....	707,000	30,000	Operations abandoned in 1924.
Long Island Electric Ry., Jackson Heights, N. Y.	24.97	600,000	600,000	None	Operated by the Jamaica Central Rys.
Westchester Street R.R., New York, N. Y.	16.32	700,000	168,000	None	Sold to Third Avenue Ry.
Peoria Railway Terminal Co., Peoria, Ill.	25.28	1,000,000	2,444,000	None	
Rockford, Beloit & Janesville Ry., Rockford, Ill.	(a)	(a)	$907,000	None	Sold at foreclosure and reorganization pending.
Rockford City Traction Co., Rockford, Ill.	36.17	(a)	(a)	None	
Rockford & Interurban Ry., Rockford, Ill.	76.00	$4,000,000	2,175,500	None	
Minneapolis, Anoka & Cuyuna Range Ry., Minneapolis, Minn.	18.23	300,000	380,000	None	
Sharon & New Castle Street Ry., Youngstown, Ohio	17.00	120,000	120,000	None	
Denver & Interurban R.R., Denver, Colo.	45.63	101,500	1,079,000	None	Operations abandoned and bus service substituted.
Helena Lignt & Railway Co.	18.50	935,000	878,000	None	
Total of foreclosure sales without receivers discharge (12 cos.)	319.83	8,071,500	9,758,500	30,000	
Foreclosures Without Receiverships in 1926					
Philadelphia & Easton Transit Co.	32.00	546,600	364,400	None	
Lebanon-Thornton Traction Co.	10.00	150,000	150,000	None	
Cleveland, Painesville & Eastern R.R.	38.76	(a)	(a)	(a)	
Total foreclosures without receiverships (3 cos.)	80.76	696,600	514,400	None	

(a) Information not available.

cago Railway was sold at receivership sale in October. Shortly afterward all operations were suspended and the receiver was discharged.

Eight companies, comprising 255.45 miles of track, terminated receiverships and are no longer operating. The Laconia Street Railway and the Northern Cambria Railway have already been dismantled and the Kankakee & Urbana Traction Company is now being dismantled. The Hornell Traction Company and the North Branch Transit Company abandoned railway operations and inaugurated bus service in the territory formerly covered by the railways. Other companies which abandoned operations are the Connecticut Valley Street Railway, the New York & Long Island Traction Company and the Dayton, Covington & Piqua Traction Company.

The largest of the companies which went into receivers' hands because of financial difficulties were the Utah-Idaho Central Railroad, with 115 miles of track; the Olean, Bradford & Salamanca Railway, with 100 miles; the Southwestern Missouri Railroad, with 92 miles, and the Rockford & Interurban Railway, 78 miles.

The largest properties in receivership at the close of 1926 are the Detroit United Railway, with 613.89 miles; the United Railways of St. Louis, with 463.18 miles; the Chicago Railways and the Union Traction Company of Indiana, with 450.53 miles.

Included in Table I for 1926 was the Tiffin & Fostoria Railway, Tiffin, Ohio. Information received from the company this year resulted in its being dropped from Table IV in this issue. The property was sold to the Toledo, Fostoria & Findlay Railway in 1925, and was never in receivership.

Three properties in Rockford, Ill., went into receivership last year—the Rockford & Interurban Railway, the Rockford, Beloit & Janesville Electric Railway and the Rockford City Traction Company. A plan of reorganization has already been submitted to the bondholders and all the properties have gone through foreclosure proceedings. This leaves only the final reorganization steps to be perfected before the companies terminate receiverships.

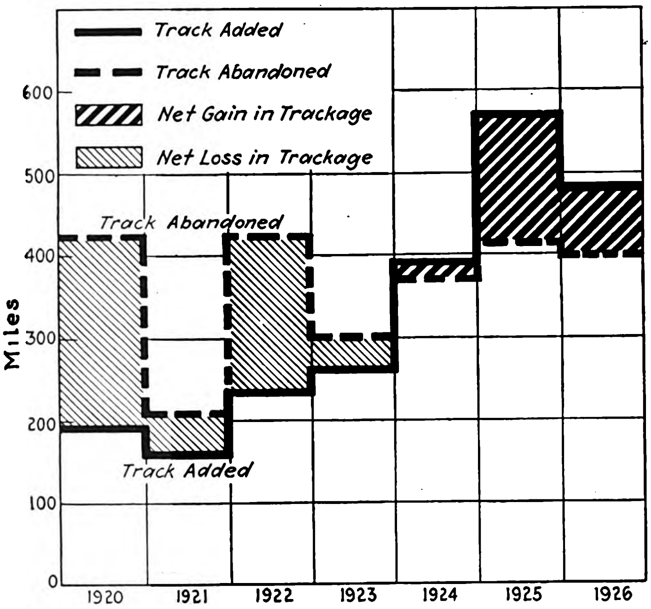
The Connecticut Valley Street Railway property was abandoned about two years ago. Early in 1926 the receiver completed the distribution of the assets and was released by the court.

Another reorganization pending at the present time is that proposed for the Second Avenue Railroad, New York City. This company went into receiver's hands in 1908, and is the oldest. A plan has already been proposed to sell the property at public auction in January and form two separate corporations to control the real estate and railway properties of the company.

Marked Increase in Track Activity During Year

Mileage of Extensions and Reconstruction in 1926 Was 20 Per Cent Greater than in 1925—Largest Increase Was in Rebuilt Interurban Track—Less Electrification of Steam Railroads Occurred than During the Preceding Year—Track Abandonments Were Lower—Total Electrified Mileage Showed Substantial Gain

INCREASED activity in electric railway track reconstruction, both city and interurban, was one of the outstanding developments of 1926, as indicated by the figures of this year's annual survey. The mileage of track rebuilt during the past year exceeded that of 1925 by nearly 40 per cent. Approximately the same mileage of extensions was built in 1926 as in 1925. Steam railroad electrification during the year amounted to about two-thirds of that done the year before. The total of all trackwork, including extensions, reconstruction and electrification, was 1,290 miles, as compared with 1,155 miles in 1925, an increase of about 12 per cent. Abandonments were somewhat less than those of the preceding year. As a result of these various factors an important gain was made in the total electrified track mileage of the country. This marked the third successive year in which the additions to trackage exceeded the abandonments.



Net Gain in Electrified Trackage During Past Three Years Has Offset Much of Earlier Loss

Interurban track rebuilt during the year totaled more than 200 miles. Electric railways to the number of 63 reported having done work of this kind as compared with 46 companies in 1925 reporting 93 miles rebuilt. City track reconstruction during 1926 amounted to nearly 600 miles, as against 486 miles the year before. The number of railways making such improvements increased from 160 to 181. In all over 800 miles of electric railway track were rebuilt in 1926, an increase of 216 miles over the 1925 figure. Details of the work done by individual companies are given in Table I.

Extensions made during the past year amounted to 218 miles, or approximately the same as the preceding year. Of this amount 193 miles were city extensions, a slight decrease from 1925, when such extensions totaled 227 miles, and interurban extensions were 125 miles, or slightly more than the year before, when the corresponding figure was 112 miles. City extensions were reported this year by 75 companies, as compared with 80 the year before. Interurban extensions were made by 38 companies as against 35 in 1925. Names of companies making extensions are given in Table I, together with the miles of track added. An accompanying chart shows graphically the comparative mileage of reconstruction and extensions of electric railway tracks by years since 1919.

Comparison of Track Construction by Years

Year	No. of Companies	Track Extensions—Miles City	Inter-urban	Total	Track Rebuilt—Miles City	Inter-urban	Total	Electrified Steam Lines Miles
1908	157	(a)	(a)	1174.5	(a)	(a)	(a)	84.00
1909	160	(a)	(a)	774.7	(a)	(a)	(a)	112.40
1910	217	(a)	(a)	1204.8	(a)	(a)	(a)	192.40
1911	223	(a)	(a)	1105.0	(a)	(a)	(a)	86.50
1912	171	(a)	(a)	869.4	(a)	(a)	(a)	80.80
1913	181	(a)	(a)	974.9	(a)	(a)	(a)	119.00
1914	163	(a)	(a)	716.5	(a)	(a)	(a)	229.00
1915	136	(a)	(a)	596.0	(a)	(a)	(a)	448.20
1916	104	115.40	240.90	356.30	(a)	(a)	(a)	388.00
1917	121	251.10	125.60	376.70	(a)	(a)	375.40	66.00
1918	80	216.41	97.41	313.82	(a)	(a)	155.43	275.70
1919	73	110.90	29.67	140.57	307.06	82.82	389.89	287.60
1920	87	145.69	30.87	176.56	246.21	115.56	361.77	8.92
1921	78	108.15	38.95	147.10	488.96	126.25	615.21	8.08
1922	104	126.27	85.11	211.38	584.75	154.95	739.70	12.35
1923	272	169.61	63.54	233.15	559.77	294.86	854.63	26.12
1924	243	218.09	93.99	312.08	585.51	178.82	764.33	83.39
1925	207	227.31	112.48	339.79	485.75	93.15	578.90	236.36
1926	236	193.20	124.76	317.96	594.35	208.17	802.52	169.52

(a) Information not available.

Electrification of steam railroads totaling 170 miles in 1926 was reported by nine companies. In 1925 four companies reported 236 miles of steam railroad track electrified. Of the mileage recently converted to electric operation, the greater part belonged to the Virginian Railway, which electrified 135 miles. Other developments of this character were limited to small amounts. Figures for individual companies follow:

Electrified Steam Railroad Extensions

	Single Track Miles
Virginian Railway	135.30
Long Island Railroad	17.71
Niagara, St. Catharines & Toronto Railway	10.96
Oklahoma Railways	2.73
Pacific Electric Railway	1.30
Northeast Oklahoma Railroad	1.16
Chicago, Milwaukee & Pacific Railroad	.17
New York, New Haven & Hartford Railroad	.17
Denver & Intermountain Railroad	.02
Total	169.52

Less track was abandoned last year than in the year before. Only 36 miles of city track was abandoned by electric railways, which continued operation of the ma-

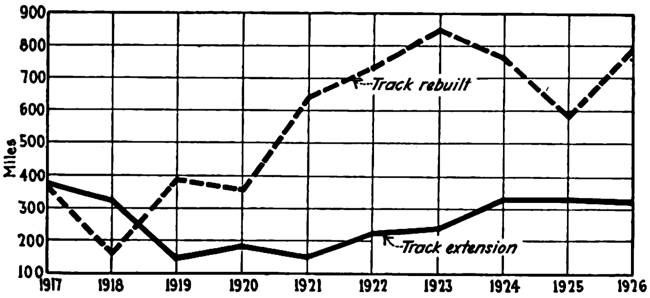
Table I—Track Extensions and Reconstruction in 1926

Name of Company	Extension Miles City	Extension Miles Inter-urban	Rebuilt Miles City	Rebuilt Miles Inter-urban
Connecticut				
Connecticut Co.	4.04	0.90	21.33	9.73
New York, New Haven & Hartford R. R.	....	.49	....	....
Maine				
Bangor Hydro-Electric Co.	....	....	1.66	....
York Utilities Co.	....	....	0.75	....
Massachusetts				
Berkshire Street Ry.	....	....	0.87	3.03
Boston Elevated Ry.	0.70	....	17.56	....
Eastern Massachusetts Street Ry.	1.20	....	8.15	4.56
East Taunton Street Ry.	1.48	10.00	0.25	2.50
Greenfield & Montague Transportation Area	....	....	0.50	....
Holyoke Street Ry.	....	....	1.05	....
Massachusetts Northeastern Street Ry.	....	....	0.40	3.00
Middlesex & Boston Street Ry.	....	....	....	3.54
Milford & Uxbridge Street Ry.	....	....	....	4.00
Springfield Street Ry.	0.27	....	3.22	2.68
Union Street Ry.	....	....	1.12	0.36
Worcester Consolidated Street Ry.	....	....	1.10	0.25
New Hampshire				
Berlin Street Ry.	....	....	2.00	....
Manchester Street Ry.	....	....	1.14	....
Rhode Island				
United Electric Rys.	1.24	0.09	4.56	3.68
Vermont				
Burlington Traction Co.	....	....	0.11	....
Springfield Terminal Ry.	....	....	....	2.00
Vergennes Power Co.	....	....	....	1.50
District of Columbia				
Capital Traction Co.	....	....	1.45	....
Washington Railway & Electric Co.	....	....	5.56	....
Maryland				
United Rys & Electric Co.	1.18	....	14.60	....
New Jersey				
Cumberland Traction Co.	....	....	2.00	....
Morris County Traction Co.	....	....	1.33	....
Pennsylvania-New Jersey Ry.	....	....	0.75	....
Public Service Railway	1.00	....	....	....
Trenton & Mercer County Traction Corp.	....	....	....	3.52
New York				
Brooklyn City R.R.	....	....	11.24	....
Brooklyn-Manhattan Transit Corp.	....	....	12.00	....
City of New York	....	....	0.97	....
Elmira Water, Light & Railroad Co.	....	....	4.00	....
Empire State R. R.	....	....	0.16	....
Erie County Traction Corp.	....	....	0.57	....
Fonda, Johnson & Gloversville R.R.	....	....	0.52	....
Interborough Rapid Transit Co.	1.18	....	....	....
International Ry.	.73	....	.45	....
Jamaica Central Rys.	0.75	....	0.80	....
Jamestown Street Ry.	....	....	0.25	4.00
New York & Queens County Ry.	0.09	....	1.03	....
New York & Stamford Ry.	....	....	....	2.21
New York Rys.	....	....	3.00	....
New York State Rys.	....	....	8.10	....
New York, Westchester & Boston Ry.	....	3.58	....	....
Richmond Light & R.R. Co.	....	....	0.77	....
Rochester, Lockport & Buffalo R.R.	....	....	....	1.06
Rochester & Syracuse R.R.	....	....	....	0.64
Rome Railway & Lighting Co.	....	....	0.50	....
Schenectady Ry.	....	....	1.55	....
Third Ave. Ry.	....	....	8.58	....
United Traction Co.	....	....	1.38	....
Warren & Jamestown Street Ry.	....	....	0.34	....
Pennsylvania				
Chambersburg & Shippensburg Ry.	2.00	9.00	....	....
Conestoga Traction Co.	....	....	0.67	0.43
Erie Rys.	0.37	....	1.14	....
Homestead & Mifflin Street Ry.	....	....	....	0.50
Lehigh Valley Transit Co.	....	0.11	2.98	0.14
Hanover & McSherrytown Street Ry.	....	....	0.33	....
Harrisburg Rys.	....	....	2.08	....
Hershey Transit Co.	....	....	....	14.00
Mauch Chunk Transit Co.	....	....	0.76	....
Philadelphia & West Chester Traction Co.	....	0.29	....	....
Pittsburgh Rys.	2.78	0.32	25.59	2.62
Reading Transit Co.	....	....	1.30	3.00
Schuylkill Ry.	....	....	0.67	....
Scranton Ry.	0.28	....	2.06	2.16
Shamokin & Mt. Carmel Transit Co	0.54	....	....	....
Southern Cambria Ry.	....	....	1.00	....
Trenton, Bristol & Philadelphia Street Ry	....	....	5.50	....
West Penn Rys	0.15	....	....	2.02
Westside Electric Street Ry.	....	....	2.00	....
Williamsport Passenger Ry.	1.31	....	0.21	....
York Rys.	....	....	0.25	....
Virginia				
Danville Traction & Power Co.	....	....	2.00	....
Newport News & Hampton Railway, Gas & Electric Co.	....	....	1.13	....
Virginia Electric & Power Co.	4.00	....	8.37	....
West Virginia				
Ohio Valley Electric Ry.	....	....	7.57	1.90
Illinois				
Aurora, Elgin & Fox River Electric Co.	0.29	....	1.29	....
Chicago, Aurora & Elgin R.R.	....	....	....	29.30
Chicago & Joliet Electric Ry.	....	....	....	1.33
Chicago, North Shore & Milwaukee R.R.	....	48.74	1.40	1.30
Chicago Rapid Transit Co.	....	....	9.70	....
Chicago Surface Lines	5.34	....	37.44	....
Chicago & West Towns Ry.	....	....	3.50	....
East St. Louis & Suburban Ry.	0.23	....	1.70	2.30
Evanston Ry.	1.58	....	....	....
Illinois Power Co.	....	....	0.84	....
Illinois Power & Light Corp.	....	....	4.30	....
Illinois Traction System	....	....	....	4.41
North Kankakee Street Ry.	....	....	0.35	....
Rockford City Traction Co.	0.27	....	4.60	....
Indiana				
Chicago, South Bend & Northern Indiana Ry.	....	....	0.99	....
Gary Rys.	....	0.50	....	....
Indianapolis Street Ry.	6.00	....	4.70	....
Indiana Service Corp.	0.74	1.47	1.80	3.85
Northern Indiana Power Co.	....	....	0.36	....
Southern Indiana Gas & Electric Co.	0.34	....	2.75	....
Terre Haute, Indianapolis & Eastern Traction Co.	....	....	2.39	0.38
Union Traction Co. of Indiana	0.94	0.23	1.08	....
Iowa				
Cedar Rapids & Marion City Ry.	....	....	1.00	....
Des Moines City Ry.	1.50	0.20	2.00	....
Iowa Southern Utilities Co. (Ottumwa)	....	....	0.25	....
Sioux City Service Co.	0.76	....	0.07	....
Tri-City Ry. of Iowa	....	0.19	0.64	0.78
Kentucky				
Kentucky Traction & Terminal Co.	....	....	0.60	....
Kentucky Utilities Co.	....	....	0.38	....
Louisville Ry.	0.27	....	3.83	0.30
Michigan				
Department of Street Rys., Detroit	3.01	....	15.46	....
Detroit United Ry.	1.95	0.25	4.60	8.60
Duluth Street Ry.	2.70	....	0.67	....
Grand Rapids Ry.	0.36	....	3.45	....
Michigan Electric Ry.	....	0.19	....	....
Minnesota				
Twin City Rapid Transit Co.	5.00	....	5.40	....
Missouri				
City Light & Traction Co.	....	....	0.19	....
Kansas City, Clay County & St. Joseph Ry.	....	....	....	0.75
Kansas City Public Service Co.	....	....	6.00	....
Missouri Power & Light Co.	....	....	0.67	....
St. Joseph Railway, Light, Heat & Pwr. Co.	....	....	1.95	....
United Rys of St. Louis	0.09	1.53	13.12	0.44
Ohio				
Cincinnati, Hamilton & Dayton Ry.	....	1.60	2.40	....
Cincinnati, Newport & Covington Ry.	....	....	0.27	....
Cincinnati Street Ry.	....	8.20	11.31	....
City of Ashtabula, Division of Street Rys.	....	....	0.45	....
City Ry., Dayton	....	....	4.17	....
Cleveland Ry.	4.08	....	8.46	....
Cleveland Southwestern Railway & Lt. Co.	....	....	....	12.00
Columbus, Delaware & Marion Electric Co.	....	....	....	4.00
Dayton & Troy Elec. Ry.	....	....	....	.57
Dayton & Western Traction Co.	....	0.35	....	0.50
Lancaster Traction & Power Co.	....	....	0.09	....
Lima-Toledo R. R.	....	0.19	....	....
Northern Ohio Pwr. & Light Co.	0.22	0.19	2.00	1.00
Pennsylvania-Ohio Electric Co.	....	....	0.30	....
Peoples Ry., Dayton	....	....	1.20	....
Southern Ohio Public Service Co.	0.37	....	....	0.55
Steubenville, East Liverpool & Beaver Valley Traction Co.	....	....	1.70	0.95
Western Ohio Ry.	....	....	0.50	....
Wisconsin				
Lake Superior District Power Co.	....	....	0.40	....
Madison Rys.	0.25	....	0.50	....
Milwaukee Elec. Ry. & Light Co.	5.24	9.00	10.52	8.11
Milwaukee Northern Ry.	....	....	0.15	....
Wisconsin Power & Light Co.	....	....	1.42	0.71
Alabama				
Alabama Power Co.	....	....	4.83	....
Birmingham Electric Co.	0.79	....	12.77	....
Mobile Light & Railroad Co.	....	....	1.27	....
Arkansas				
Arkansas Power & Light Co.	0.37	....	0.63	....
Forth Smith Light & Traction Co.	....	....	4.50	....
Southwestern Gas & Electric Co.	....	....	2.60	....
Florida				
Coral Gables Rapid Transit Co.	12.00	....	....	....
Miami Beach Railway	3.70	8.10	....	6.00
Georgia				
Georgia Railway & Power Co.	1.40	0.15	6.74	....
Savannah Electric & Power Co.	0.40	....	0.87	....
Louisiana				
New Orleans Public Service, Inc.	1.97	....	4.86	....
Shreveport Rys.	....	....	0.07	....
South New Orleans Light & Traction Co.	....	....	0.83	....
Mississippi				
Mississippi Power Co., Gulfport	....	....	2.25	....
North Carolina				
Carolina Power & Light Co.	....	....	0.41	....
North Carolina Public Service Co.	....	....	2.00	....
Tidewater Power Co.	....	....	1.20	....
South Carolina				
Charleston Consolidated Ry. & Lighting Co.	....	....	0.40	....
South Carolina Gas & Electric Co.	....	....	0.57	....
Tennessee				
Knoxville Power & Light Co.	....	....	0.54	....
Memphis Street Ry.	0.48	....	4.33	....
Nashville Ry. & Lt. Co.	0.60	....	10.73	....
Tennessee Electric Power Co.	....	....	1.60	....

Table I—Track Extensions and Reconstruction in 1926 (Concluded)

Name of Company	Extension Miles		Rebuilt Miles	
	City	Inter-urban	City	Inter-urban
California				
Bakersfield & Kern Electric Ry.	....	....	0.20	....
Central California Traction Co.	....	....	....	1.25
Key System Transit Co.	2.39	1.47	25.98	....
Los Angeles Ry.	2.46	....	17.03	....
Market Street Ry.	....	....	2.40	....
Municipal Ry. of San Francisco	1.13	....	1.98	....
Pacific Electric Ry.	2.20	7.30	1.30	28.20
Sacramento Northern Ry.	....	1.12	....	0.69
San Diego Electric Ry.	1.15	....	2.85	....
San Francisco, Napa & Calistoga Ry.	....	....	....	0.60
Southern Pacific R.R.	....	0.35	....	0.69
Colorado				
Denver & Intermountain R.R.	....	....	....	0.05
Denver Tramway Corp.	....	....	1.36	....
Kansas				
Arkansas Valley Interurban Ry.	....	0.06	....	....
Kansas City, Lawrence & Topeka Elec. R.R.	....	....	0.06	....
Kansas City, Leavenworth & Western Ry.	....	0.17	....	....
Topeka Ry.	....	....	1.00	....
Union Traction Co.	....	....	2.00	1.00
Nebraska				
Lincoln Traction Co.	....	....	0.40	....
Omaha & Council Bluffs Street Ry.	....	....	3.00	....
Omaha, Lincoln & Beatrice Ry.	....	....	0.09	....
North Dakota				
Northern States Power Co.	....	....	0.36	....
Oklahoma				
Northeast Oklahoma R.R.	....	1.16	....	....
Oklahoma Rys.	....	0.51	0.20	....
Tulsa Street Ry.	....	....	0.60	....
Oregon				
Portland Electric Power Co	0.22	1.44	1.06	....
Texas				
Abilene Traction Co.	....	....	0.20	....
Dallas Ry. & Terminal Co.	3.88	....	5.64	....
Eastern Texas Electric Co.	....	....	0.69	....
El Paso Electric Co.	0.16	....	....	....
Galveston Electric Co.	....	....	1.00	....
Houston Electric Co.	0.30	....	3.82	....
Laredo Electric & Railway Co.	0.06	....	0.40	....
Northern Texas Traction Co.	....	....	3.36	....
Rio Grande Valley Traction Co.	....	....	0.99	....
San Antonio Public Service Co.	....	....	0.86	....
Texas Electric Ry.	....	....	....	0.53
Utah				
Utah-Idaho Central R.R.	....	....	....	....
Utah Light & Traction Co.	0.35	....	4.49	....
Washington				
Grays Harbor Railway & Light Co.	....	....	0.34	....
Puget Sound Power & Light Co.	0.50	....	0.80	....
Seattle Municipal Ry.	1.75	....	2.20	....
Yakima Valley Transportation Company	....	....	1.00	....
Canada				
British Columbia Electric Ry.	3.71	....	2.65	....
Canadian National Rys.	....	0.64	....	....
Hamilton Street Ry.	....	....	2.00	....
Hull Electric Co.	0.08	0.11	....	....
Hydro-Electric Power Commission	2.14	....	1.34	....
Levis Tramways	....	....	0.28	....
London Street Ry.	....	....	0.58	....
Montreal & Southern Counties Ry.	....	....	0.20	2.33
Montreal Tramways	9.94	0.92	14.50	2.40
New Brunswick Power Co.	....	....	0.50	....
Newfoundland Light & Pwr. Co.	3.18	....	....	1.00
Niagara, St. Catharines & Toronto Ry.	0.61	1.91	5.61	0.27
Nova Scotia Tramways & Pwr. Co.	0.55	....	0.12	....
Ottawa Electric Ry.	....	....	0.50	1.00
Port Arthur Civic Ry	1.00	....	....	....
Quebec Railway, Light & Power Co.	1.30	....	2.32	....
Sherbrooke Railway & Power Co.	....	....	0.34	....
Three Rivers Traction Co.	....	....	0.22	....
Toronto Transportation Commission	1.29	....	1.50	....
Winnipeg Electric Co.	0.86	2.09	0.76	....
Hawaii				
Honolulu Rapid Transit Co.	....	....	0.08	....
Porto Rico				
Porto Rico Railway, Light & Power Co.	....	....	6.00	....
Total	193.20	124.76	594.35	208.17

jor portions of their systems, as compared with 114 miles in 1925. Interurban track amounting to 160 miles was abandoned during the past year by companies which continued to operate elsewhere. Similar abandonments in 1925 totaled 128 miles. Table II shows the trackage abandoned by various railways during the year.

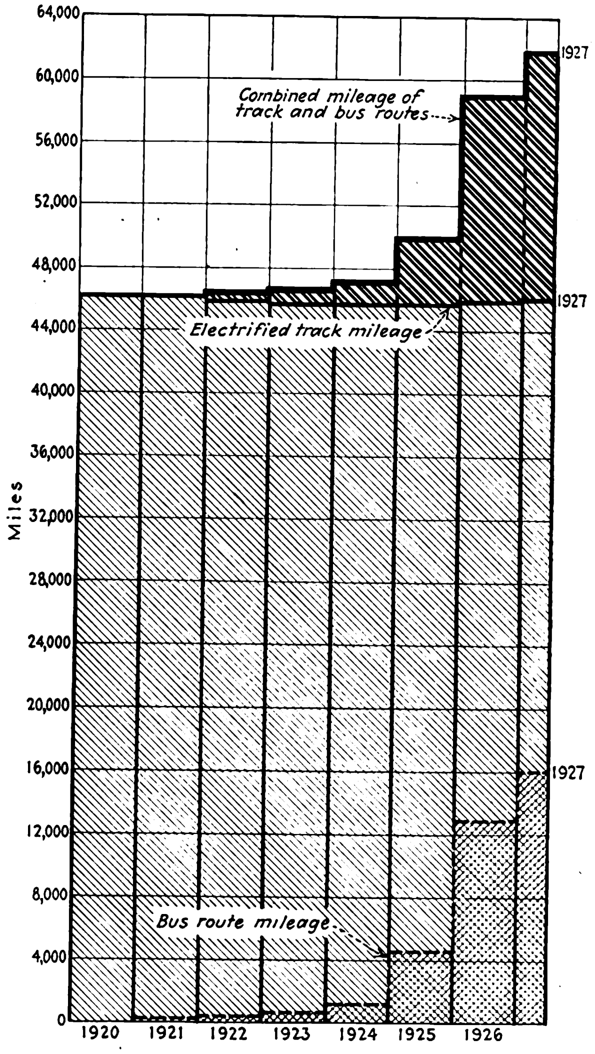


Railways Were Active in Track Reconstruction in 1926, Extensions Remained About the Same

Entire properties abandoned in 1926 numbered fifteen with 206 miles of track. During the preceding year seventeen railways with 174 miles of track were entirely abandoned. In some cases bus operation under the same management replaced the rail operation, as indicated in the article on bus development which is

Entire Properties Abandoned in 1926

	Miles
Buffalo Valley Collieries Company	7.80
Dayton, Covington & Piqua Traction Company	34.00
Denver & Interurban Railroad	11.30
Exeter, Hampton & Amesbury Street Railway	22.00
Gardner-Templeton Street Railway	10.00
Hornell Traction Company	9.64
Hudson River & Eastern Traction Company	2.81
Iron River, Stambaugh & Crystal Falls Street Railway	6.00
Kankakee & Urbana Traction Company	26.00
Manchester & Derry Street Railway	8.37
Nelson Street Railway	4.00
North Branch Transit Company	26.60
Northern Cambria Railway	13.00
Peekskill Lighting & Railroad Company	7.84
Sheridan Railway	16.50
Total	205.86



Combined Mileage of Track and Bus Routes Is Now One-Third Larger than in 1920 published elsewhere in this issue. In other cases no regular transportation is now furnished on the abandoned routes.

In all, less electric railway trackage was abandoned in 1926 than in 1925, the totals being 401 and 416 miles respectively. Track abandonments were less by 86 miles than the additions made during the same period. Thus 1926 showed a substantial net gain in the electrified track mileage of the country. Electric railways have added some 15,000 miles of bus routes during the past five years, as shown on an accompanying chart. From this it will be seen that at present transportation is furnished by electric railways on a combined total of over 61,000 miles of track and bus routes.

Table II—Partial Track Abandonments in 1926

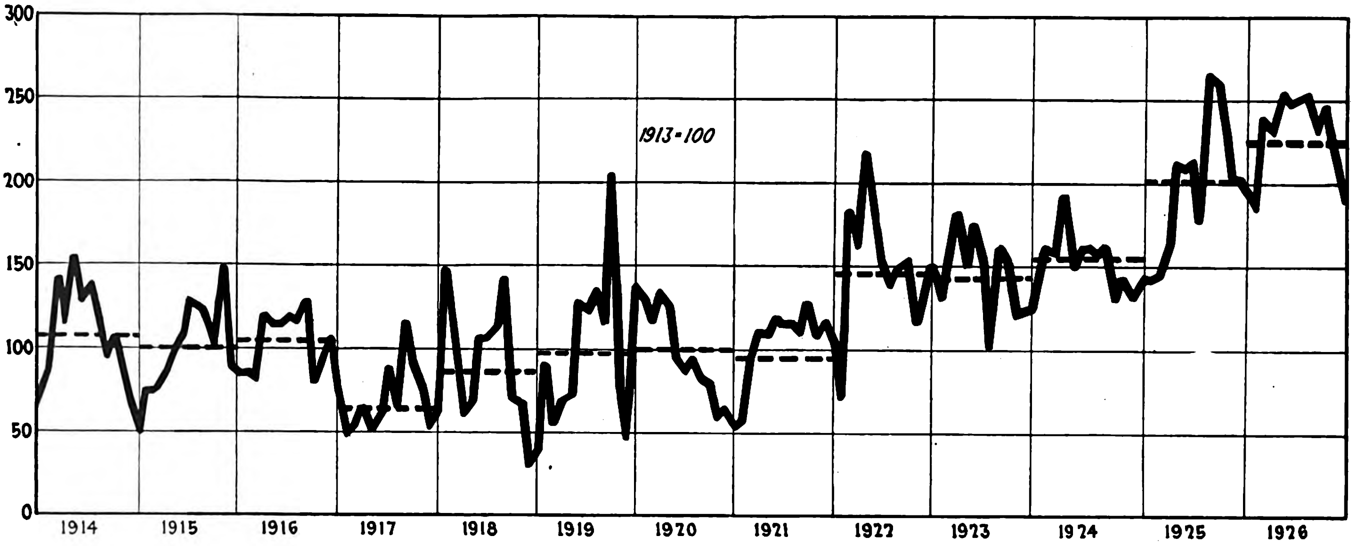
	Miles of Track			
	Service Suspended	Abandoned	Removed	Type of Service
Connecticut				
Connecticut Co.	......	3.07	1.39	City
	......	7.62	5.91	Interurban
New York, New Haven & Hartford R.R.	......	......	.45	....
Massachusetts				
Berkshire Street Ry	......	......	.57	Interurban
Boston Elevated Ry	5.59	2.18	5.07	City
Boston & Worcester Street Ry	6.00	......	......	Interurban
Eastern Massachusetts Street Ry	......	15.54	......	Interurban
Lowell & Fitchburg Street Ry	1.00	......	......	Interurban
Middlesex & Boston Street Ry	......	20.19	3.90	Interurban
Plymouth & Brockton Street Ry	......	......	6.00	Interurban
Springfield Street Ry	17.43	......	2.28	Interurban
	.47	......	......	City
Union Street Ry	......	......	.03	City
Worcester Consolidated Street Ry	5.30	......	......	City
New Hampshire				
Keene Electric Ry	10.00	......	9.00	City
Rhode Island				
Newport & Providence Ry	1.50	......	......	City
United Electric Rys	......	......	.45	City
	5.47	......	7.70	Interurban
District of Columbia				
Capital Traction Co	......	......	.70	City
Washington Railway & Electric Co	......	......	2.80	City
Maryland				
United Railways & Electric Co	......	......	2.06	City
New Jersey				
Morris County Traction Co	......	......	6.00	Interurban
New York				
Brooklyn-Manhattan Transit Corp	......	......	.95	City
Buffalo & Erie Rys	......	2.00	......	City
International Ry	3.17	......	2.15	City
	14.37	13.52	8.55	Interurban
Jamestown Street Ry	......	14.00	4.00	Interurban
New York & Stamford Ry	......	.52	......	City
New York State Rys	1.35	......	......	City
Olean, Bradford & Salamanca Ry	5.00	......	9.00	Interurban
Poughkeepsie & Wappinger Falls Ry	......	......	.38	City
United Traction Co	5.99	......	3.22	City
Pennsylvania				
Bangor & Nazareth Transit Co	11.00	......	......	Interurban
Bangor & Portland Transit Co	......	7.00	......	Interurban
Citizens Traction Co	2.85	......	......	City
	7.80	......	......	Interurban
Erie Rys	......	.50	.20	City
Lehigh Valley Transit Co	......	11.90	14.03	Interurban
Philadelphia Rys	3.26	......	......	City
Philadelphia & West Chester Trac. Co.	......	1.60	......	Interurban
Pittsburgh Rys	......	......	8.92	City
	......	......	.03	Interurban
Scranton Ry	......	6.17	1.50	Interurban
Shamokin & Edgewood Electric Ry	......	......	5.00	Interurban
United Traction Street Ry	12.29	......	......	Interurban
Virginia				
Newport News & Hampton Railway, Gas & Electric Co	......	......	.32	Interurban
Virginia Electric & Power Co	......	2.52	......	City
Illinois				
Coal Belt Electric R.R.	......	3.50	......	Interurban
East St. Louis & Suburban Ry	2.90	......	.06	City
Illinois Power & Light Corp.	13.37	......	......	City
North Kankakee Street Ry	.34	......	......	City
Indiana				
Chicago, South Shore & South Bend R.R.	2.00	......	......	City
Indianapolis Street Ry	.69	......	......	City
Terre Haute, Indianapolis & Eastern Traction Co.	......	......	.20	Interurban
Union Traction Co. of Indiana	3.44	......	3.33	City
Iowa				
Charles City Western Ry	1.20	......	......	Interurban
Des Moines City Ry	......	.60	......	City
Iowa Southern Utilities Co.:				
(Burlington)	......	2.00	......	City
(Centerville)	......	1.25	......	City
(Ottumwa)	......	4.50	......	City
Sioux City Service Co	......	1.14	......	City
Tri-City Ry.	4.12	......	......	City
Kentucky				
Kentucky Utilities Co	4.50	......	......	City
Louisville Ry	......	......	.19	City
	.04	......	......	Interurban
Michigan				
City of Detroit—Dept. of St. Rys	......	......	5.49	City
Detroit United Ry	.82	......	......	City
Menominee & Marinette Light & Traction Co.	1.73	......	......	City
Michigan Electric Ry	3.50	......	.68	Interurban
Missouri				
City Light & Traction Co.	1.75	......	......	City
Missouri Power & Light Co	.09	......	......	City
St. Francois County R.R.	......	2.00	......	Interurban
United Rys.	.39	.68	......	City
	.42	.41	......	Interurban
Ohio				
Cincinnati Street Ry	1.80	......	......	City
	......	8.20	......	Interurban
Cleveland Ry.	1.76	1.00	......	City
Cleveland Southwestern Ry. & Light Co.	......	10.30	......	Interurban
Columbus, Delaware & Marion Electric Co.	......	3.88	......	City
Columbus, Urbana & Western Electric Ry.	......	......	7.50	Interurban
Community Traction Co.	......	......	6.30	City
Ohio Public Service Co.	......	3.28	......	Interurban
Pennsylvania-Ohio Electric Co.	1.30	......	......	City
	......	17.00	......	Interurban
Southern Ohio Public Service Co.	8.78	......	......	City
Western Ohio Ry.	1.00	......	......	City
Wisconsin				
Madison Rys.	.75	......	......	City
Milwaukee Electric Railway & Light Co.	......	2.58	......	City
	.17	1.23	......	Interurban
Northern States Power Co.	......	......	8.07	Interurban
Wisconsin Power & Light Co.	1.20	......	.20	City
Wisconsin Public Service Corp.	2.89	2.00	......	City
Alabama				
Alabama Power Co.	......	......	.75	City
Birmingham Electric Co.	.15	.08	......	City
Mobile Light & Railroad Co.	......	......	1.30	City
Georgia				
Columbus Electric & Power Co.	......	......	2.45	City
Georgia Railway & Power Co.	......	......	1.12	City
Macon Railway & Light Co.	......	.40	......	City
Savannah Electric & Power Co.	......	......	1.16	City
Florida				
Jacksonville Traction Co.	......	......	.54	City
Key West Electric Co.	2.70	......	1.68	City
Louisiana				
New Orleans Public Service, Inc.	......	......	14.66	City
Mississippi				
Mississippi Power Co. Gulfport	......	......	22.50	Interurban
Mississippi Power & Light Co.	......	......	.60	City
North Carolina				
Durham Public Service Co.	1.83	......	......	City
Tidewater Power Co.	......	.40	......	Interurban
Arizona				
Phoenix Street Ry.	6.00	......	......	Interurban
California				
Key System Transit Co.	......	.12	......	City
Pacific Electric Ry.	......	......	8.80	City
	......	......	2.20	Interurban
Southern Pacific Co.	......	......	8.93	City
	......	......	1.13	Interurban
Union Traction Co. (Santa Cruz)	3.50	......	......	City
Colorado				
Colorado Springs & Interurban Ry.	......	2.53	......	City
Denver & Intermountain R.R.	......	......	.05	Interurban
Denver & South Platte Ry.	......	4.25	......	Interurban
Denver Tramway	4.33	......	......	City
Grand River Valley R.R.	3.00	......	......	City
Idaho				
Boise Valley Traction Co.	4.30	......	......	City
Nebraska				
Lincoln Traction Co.	.57	......	......	City
Omaha, Lincoln & Beatrice Ry.	.63	......	......	City
North Dakota				
Northern States Power Co.	1.00	......	......	City
Oklahoma				
Northeast Oklahoma Ry.	.19	......	......	Interurban
Oklahoma Rys.	......	......	.63	City
Oregon				
Portland Electric Power Co.	.54	......	......	City
Willamette Valley Southern Ry.	......	11.40	......	Interurban
Texas				
Houston Electric Co.	......	......	.38	City
San Antonio Public Service Co.	3.40	......	......	City
Southwestern Traction Co.	10.50	......	......	City
Utah				
Utah Light & Traction Co.	......	.64	......	City
	......	......	8.74	Interurban
Washington				
Puget Sound Power & Light Co.	......	......	.98	City
Seattle Municipal Ry.	.91	......	......	City
Yakima Valley Transportation Co.	1.80	......	......	City
Canada				
Canadian National Rys.	......	......	7.53	Interurban
London Street Ry.	......	.60	......	City
Niagara, St. Catharines & Toronto Ry.	.09	......	......	Interurban
Porto Rico				
Ponce Electric Co.	1.11	1.10	......	City
Total	227.34	195.40	230.71	

Manufacturing Activity Should Continue at High Level

General Economic Conditions Give No Indication that a Material Recession Is to Be Anticipated in 1927—Manufacturers in Electric Railway Field Believe Transportation Industry Is Now in Position to Realize on Its Opportunities—They Give Outlook for Year

CONSERVATIVE optimism is the keynote of all prophecies for the year 1927. Few in industry generally anticipate many new records during the forthcoming twelve months. It is obvious that production cannot be expected to pyramid indefinitely at the rate established in 1925 and 1926. However, the general opinion seems to be that the present prosperity will be at least well sustained during this year.

Certain advocates of the cyclic theory hold that the current rate of production must soon slack off. Two years of unprecedented prosperity, with the second far exceeding the first in almost every respect, with the anomalous situation existing of heavy borrowing and low money rates, with a major disaster such as that which recently occurred in Florida, passed over without a downward flicker of the prosperity wave—these things, say the ultra-conservative believers in business cycles, are lulling us into a false sense of security. Awake! Prepare for a recession!



General Construction Volume Was Maintained at a Record Level During the First Ten Months of 1926, Surpassing All Previous Years

Admittedly certain elements of the economic setting should be given attention. Declines in building activity, in automobile production and in commodity prices, the effects of low cotton prices, the unfavorable agricultural conditions existing in certain sections of the country, the extremely high level of stock prices and of speculative activity might be pointed to as falling in this category. This is the darker side of the picture.

On the other side one takes cheer in the uniformly liquid condition of business generally, the growth of the hand-to-mouth purchasing movement, the high wage levels which have been maintained in the face of slightly declining prices, the minimum of unemployment, reflected in a widely spread purchasing power on the part of labor, the revival of foreign purchasing and the increasing attention which is being given by American manufacturers to the establishment of a sound foreign market which may be resorted to in case of a temporary recession in this country. In other words, a number of stabilizing factors have been developing which may be relied upon to act as effective checks to any abrupt downward movement.

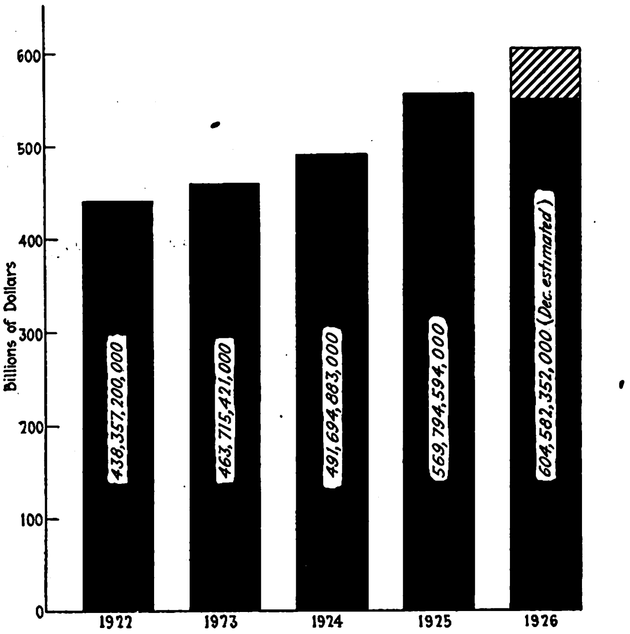
The year 1926 has been marked, industrially, by a great many highlights of surpassing interest. From the point of view of the electric railways and of the manufacturers catering to this field it has been a year largely of promise, partially of fulfillment. In practically every industrial community production has attained a high proportion of capacity, with corresponding large payrolls—a boon to the railways in increasing the demand for public transportation.

A certain retardation of general activity has been noted during the last two months of the year, but this may be attributed largely to the normal seasonal slowing down. It is perhaps more pronounced than that of a year ago, but will scarcely imperil the records which have been securely established during the first ten months, not only for high production but also for material savings which have been effected in the costs of manufacture.

Such basic industries as steel production and coal mining may generally be relied on to give a quite accurate indication of the status of industry as a whole.

In the past year steel production figures have maintained a high level throughout the summer months and at no time showed any very marked fluctuations. Although the past two months have evidenced a material reduction in ordering, the final figures for the year will undoubtedly establish a new all-time record for the industry.

Under the stimulus of the British coal strike bituminous production in this country responded as to a lash. In addition there has been a very strong domestic market which has filled in the chinks of the export trade and has vouchsafed a degree of stability to the coal industry which has been notably absent in the recent past. Production has practically reached capacity in many of the fields. Occasionally the warning is heard that labor difficulties may be expected in the spring, when the Jacksonville agreement terminates, but it is certain that every effort will be made to avert a major labor disturbance.



Bank Debits to Individual Accounts, as Reported by the Federal Reserve Bank, Indicate the Increasing Prosperity of the Country

Cumulative figures for coal exports during the first ten months of the year reveal a total of 26,321,924 tons, as against 16,152,657 tons in the corresponding period of 1925. Foreign demand accounts for only about half of the total production; the remainder must be credited to domestic consumption and to the building up of stocks in this country.

Prices have remained gratifyingly stable in most of the basic commodities. Standard steel rails have not fluctuated an iota during the past three years; copper has shown little tendency to fluctuate, while coal has undergone such gradual price movements, up during the late summer and fall months and now slightly downward once more, that consumers have suffered no embarrassment in determining when and in what quantities to purchase. Oil production has increased, partially in response to increased demand, partially because of the discovery of new oil deposits. Much oil is being pumped into storage, a guarantee that no very material advances in the prices of oil and its derivatives need be looked for in the immediate future.

Notable progress was made by the oil industry in increasing the amount of gasoline obtained from each barrel of crude, according to W. C. Teagle, president of the Standard Oil Company of New Jersey. The average gasoline yield this year was approximately 35 per cent, an increase of nearly 2½ per cent over 1925. This is mainly accounted for by the rapid spread of cracking processes.

One excellent criterion of the nation's prosperity is the yearly total of bank debits to individual accounts, as reported to the Federal Reserve Bank. Each year since 1921 this total has been rising. In 1925, particularly, it showed a noteworthy increase. While 1926 will scarcely show as large an increase over the preceding year as did 1925, there will nevertheless be a sizable increment, estimated conservatively at $34,000,000,000. Since the bank debits include not only bank clearings but also checks deposited in the banks on which they are drawn, the total is an accurate indicator of general business activity.

LOOKING TO THE FUTURE

It is interesting to note that both capital and labor share the same optimistic outlook upon the new year. Directors of the National Association of Manufacturers are inclined to this favorable view for a number of reasons, made public in statements issued during the past week. Among them were the following:

1. Business is nearer to a cash basis than it has ever been.
2. Financial panics are a thing of the past because the Federal Reserve Banking System stands as an indestructible buffer.
3. Industries are now operating at a high rate of production, yet one based upon a reasonable demand.
4. The margin of profits has been narrowed, bringing a truer relationship between costs and sales.
5. Competition will be stronger.
6. Credits have decreased and there is ample money at reasonable rates.
7. People generally are contented and there are gradually fewer labor disturbances.

John E. Edgerton, president of the National Association of Manufacturers, stated that 99 per cent of the association's membership is planning for better business in 1927 than was enjoyed in the year just past. He said that 75 per cent recorded better business in 1926 than in 1925; 68 per cent have increased their forces and 89 per cent are paying higher wages now than they were a year ago.

William Green, president of the American Federation of Labor, in a statement prepared for publication in the January issue of the *American Federationist*, said:

> The conditions are strongly indicative that 1927 will be as good a year as 1926 if not better. Many industries have established production policies and methods calculated to sustain prosperity. Our trade union movement has made a substantial contribution toward making ours a high wage country and demonstrating that high wages are compatible with low unit costs. Our resistance to wage reduction has held a definite influence in shaping industrial policies. Because wages are high we can do our part in buying the articles industries are turning out in ever-increasing quantities.

1926 AND 1927 SEEN THROUGH THE EYES OF ELECTRIC RAILWAY MANUFACTURERS

Feeling that the manufacturers whose activities bring them in direct contact with the electric railway industry would have opinions of particular interest in this consideration of the possibilities of the coming year, a representative group were asked by ELECTRIC RAILWAY

JOURNAL to state their ideas along this line. Their comments on the past year and any suggestions concerning probable new developments to be announced in 1927 were also requested.

It will be seen from the opinions next appended that the car builders are not hesitant in expressing their belief that 1927 will witness a widespread activity in the modernization of rolling stock. The intensive campaigns which have been waged to stimulate this desired movement are looked upon as having thoroughly prepared the ground for the sale of much-needed cars.

The J. G. Brill Company

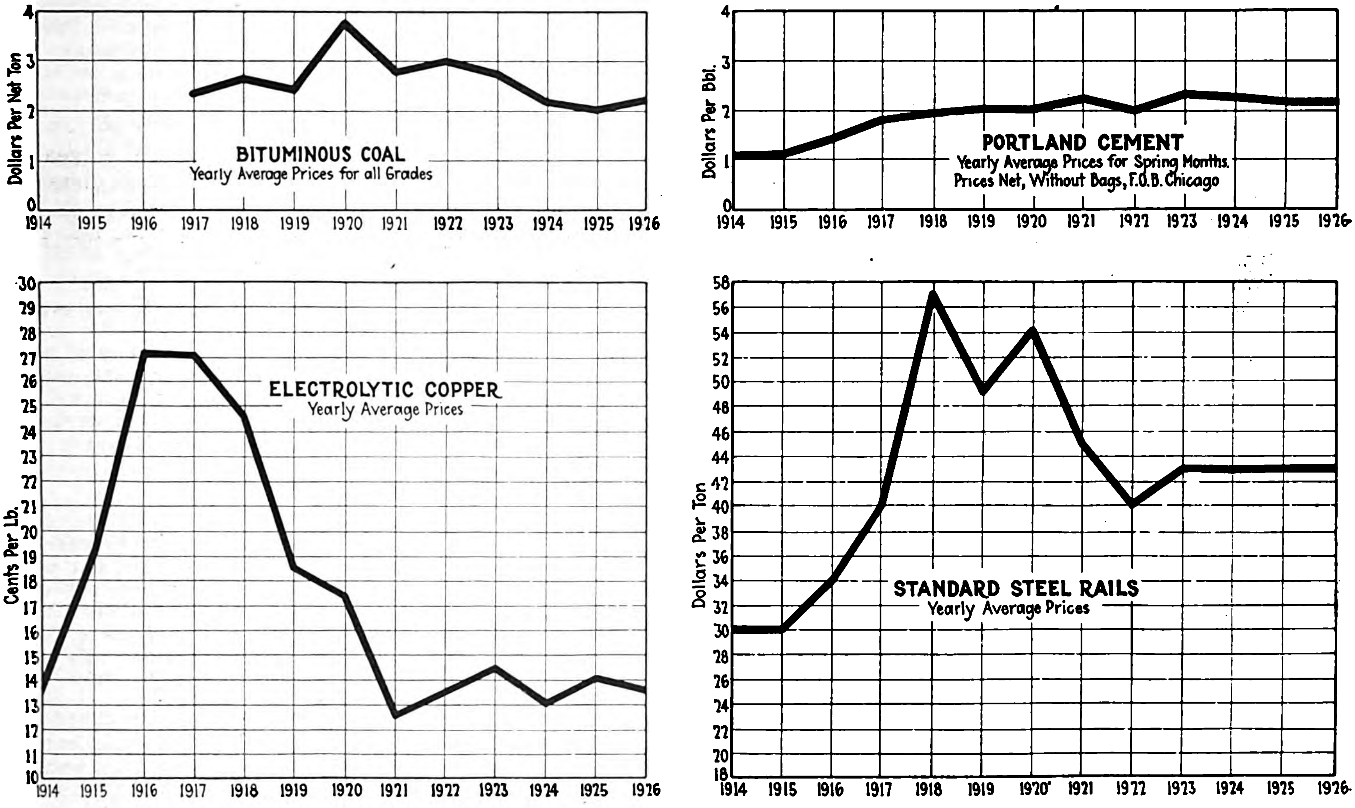
It has been our experience that while car buying during the year just passed shows some improvement over that of its predecessor, it is apparent that purchases of new rolling stock have been far below the industry's requirements during these two years.

I am inclined to believe, however, that the year 1927 will be one of increased activity to a degree which will better reflect the optimism with which the electric railway industry is now moving forward.

Deferred replacements, as well as a more definite understanding of the parts which both the electric car and the bus shall play in public transportation and a general recognition of the economic advantages of modern, light-weight cars, are factors which should stimulate car purchases during the coming year. SAMUEL M. CURWEN, President.

The Cincinnati Car Company

The year 1926 was one of arrested progress in the street railway industry. The bus, which appeared on city streets during the two previous years, offered, particularly while new, an attractive looking and rapid means of transportation, and street railway officials generally were inclined to give this new passenger car a fair chance to demonstrate its usefulness before adopting or condemning it as a substitute for the electric street car. We believe that during the year 1926 these officials became satisfied that there is not only a "passenger preference" for the new street car, which is both comfortable and safe, but that the street car is cheaper to operate, more profitable as an investment, and the only vehicle that can move the masses during the rush hours.



Four Basic Industries Maintain Fairly Constant Price Levels in Spite of Heavy Production

A year ago few street railway companies were even considering the purchase of new cars for city operation, whereas today there are numerous inquiries for new cars of light weight, attractive appearance and economical design. We believe that the buses heretofore purchased by street railways will be used as feeders, but that existing car lines will be kept in operation and extended. We, therefore, expect the year 1927 to be one of increased activity on the part of street railway operators, as well as manufacturers of cars and equipment.

H. L. SANDERS, Vice-President.

Light Weight Noiseless Electric Street Car Company

We feel that the past year has produced considerable valuable information supporting our belief and prophecy as to the value of new, attractive rolling stock, and we believe that a great deal has been accomplished in getting the electric railway industry to appreciate this fact.

E. M. MADDOX, Vice-President.

Electrical equipment manufacturers concur in the belief that the present year will equal, and probably surpass, the total of sales made during 1926. Further developments to be made in both car and gas electric bus equipment are indicated.

Westinghouse Electric & Manufacturing Company

The year 1926 marks the turning point of the electric railway industry. Orders for railway equipment booked during the past year show, in rough figures, a 25 to 30 per cent increase over the low ebb of 1925. While this, of itself, does not mean very much, it does show a definite trend upward and, when coupled with other factors, it justifies the conviction that the coming year will be marked by very definite strides toward the re-establishment of the electric railway industry and one of our sound and prosperous public utility enterprises.

Last year was marked by a crystallization of judgment by a majority of opinion as to the place of the bus and the future of the electric railway. Railway men now possess real knowledge of bus operation, its best field of service, and also its costs and limitations. They also possess knowledge of what may be accomplished by the rehabilitation of street car service.

The manufacturers have confidence in the future of the basic service of the street car for mass transportation.

Our company, for example, has expended larger amounts for engineering developments during the past three years than we did in many former years. These improvements of street car equipment introduced such things as dual ventilation, oil sealed housings, better ventilator windings, numerous improvements in controller apparatus, resistance grids and experiments with spring-borne motor equipment.

It is our conviction that the number of street cars and electrical equipments sold in 1927 will exceed the total of 1926 by from 30 to 50 per cent. MYLES B. LAMBERT, Transportation Sales Manager.

General Electric Company

A survey of the year just ended indicates a somewhat reduced volume of business in railway motor car equipment as compared with the year 1925. There have been some sales of such equipment for new extensions to existing street railways, and substantial sales of gas-electric bus equipment. If we consider the sales of gas-electric buses to electric railways, the total purchases indicate an approximately normal business, as compared with similar business during the past several years.

A very effective campaign has been instituted by the American Electric Railway Association, particularly on replacement of obsolete cars and electrical equipment, and we feel that the effects of this campaign will be reflected by an increase in car equipment business next year.

One of the outstanding features of the electric railway industry is the application of electric drive for bus transportation. It is expected that during 1927 this class of equipment will be used even more extensively.

We believe that the electrical business as a whole for the year 1927 will be equal to or greater than that for the year 1926. J. G. BARRY, Vice-President.

Westinghouse Air Brake Company

We can see no sign of any abnormal decline in business activities in the near future. We do not believe that new car orders from both steam and electric railways will decrease in 1927 as compared with 1926. Accordingly we see no reason why we should not look forward to the coming year with confidence for continued activity and prosperity.
J. A. RALSTON, Chief of Publicity.

Ohio Brass Company

The one disappointing feature of the business of our company during 1926 has been the lack of rally of the electric railway industry to the campaign and necessity for new cars. This industry holds a proportion of our interest quite out of balance with the proportion of revenue it brings to the company in comparison with the central station, mining and steam railroad fields. Doubtless, then, we are supersensitive to any evidence that this industry is not continuing to improve its position.

Apparently the year 1926, with respect to new car purchases, has been on nearly the same plane as 1925, which was the lowest in the history of the industry so far as records are available, except for 1921. This condition prevails despite the fact that some very good work has been done in the last few years, and particularly in the last year, to impress on the industry the paramount need for modernization. But it would seem that a much more effective effort must be devised to bring home to the industry the necessity for modernization, and how to accomplish it.

Successful transportation today is a matter of selling that service. But the first fundamental of selling anything is to have a product that is right in the eyes of the buyers. While track and other plant must be in good condition, to a very large extent, this matter simmers down to the cars themselves. They are the show windows of the company.

Aside from the economies that can be effected with modern equipment, there is the important consideration of developing increased riding, or, perhaps, of holding the present rate. For certainly there is nothing that impresses the public more with the feeling that the street railway is an out-of-date means of transportation and is on its way out of existence than the old cars that still navigate the streets of many cities.

As to finances, new cars will virtually finance themselves out of improved net earnings. But such improvements would be much more readily available if more companies would face squarely the necessity to go to their bondholders and sell them the necessity for accepting a much reduced face value of bonds, with preferred stock in lieu of the difference. This places a company in position, by virtue of having a smaller amount of its annual obligations in fixed charges, to improve its financial situation year by year.

It would seem that unless something is soon accomplished along the lines of financial reorganization and modernization, the industry is in danger of losing the hard-won ground it has gained in the last ten years in improved public relations and a better deal at the hands of public authorities. We cannot go on indefinitely with the old methods and old equipment. The public must have some evidence that it is getting a return for its increased investment in car rides. H. L. BROWN, Secretary.

International Steel Tie Company

The increasing optimism of the past few years, definitely crystallized in 1925 and 1926 by the discovery that new equipment more than paid its way and that the rubber-tired vehicle had its niche, has put an altogether new front on the electric railway store. We have felt this change of front very definitely in this past season's business in the reception which more permanent and ultimately renewable track construction has received from the industry.

For example, a 317-mile Middle Western property, in a complete rehabilitation of its financial and physical structure, has just completed 8 miles of twin tie track in eight weeks' time. The year 1927 promises to consolidate these confidences into a steady growth by adoption of the best in equipment, power generation, track and operating ability.
T. J. LAVAN, General Manager.

I have found in the past year a very decided tendency on the part of street railway operators to build for permanency rather than the hand-to-mouth idea of buying so prevalent a few years past. The outlook for next year seems even more optimistic and, personally, I can see more definite business in sight than in any previous year at this time. FRED H. OGDEN, Sales Manager.

Railway Track-Work Company

Our business with the electric railway industry during the present year compares favorably with that in other years. For the coming year we look for normal business, but we have no reason to believe it will be any improvement as compared with the present year, as there have been no new developments which in our opinion would make for better business conditions. W. B. GOODALL, Secretary and Treasurer.

Manufacturers of buses and bus equipment seem convinced that automotive equipment will take an even greater place in co-ordinated transportation during 1927. Inquiries for city and interurban units are active.

International Motor Company

The principal objective in 1926 of Mack Trucks, Inc., was the placing of the credit part of its business on a sound basis. This has been accomplished. We are hopeful other manufacturers will follow. If so, financially sound and established operators will find it possible to stabilize the business of selling co-ordinated transportation.

The year 1926 in the bus business saw a large increase in buses operated by public utilities and a better appreciation of their use in the street railway field. Even companies using them originally for defensive measures have found them a useful and profitable tool in transportation.

Our confidence in the prospects for 1927 is shown by the fact that, in addition to our standard line of four-cylinder Mack buses, we have added a six-cylinder and both a four-cylinder and six-cylinder gas-electric. Plant facilities have been increased anticipating the greater demand.
A. J. BROSSEAU, President.

Yellow Manufacturing Sales Corporation

Our orders booked during 1926 will show a 60 to 70 per cent increase over 1925, and I think our actual deliveries will run pretty close to 100 per cent over 1925.

There has been a slight let-down in sales during the fall months, but I think this is only temporary and I look forward to an unusually good volume of business in 1927. This information is based on our consolidated prospect list, which we compile weekly and which indicates the trend of the industry throughout the country.

I believe I am conservative when I say that we ought to have a 50 per cent increase in sales for the year 1927.

H. E. LISTMAN,
Vice-President Directing Motor Coach Sales.

American Car & Foundry Motors Company

Anything I may say in an effort to forecast the outlook for 1927 with respect to the possible expansion of automotive operations by the traction lines will of course be nothing better than a guess. There are some indications of the fact that the traction companies are realizing the economies, under certain operating conditions, of using automotive equipment in place of, or as an adjunct to, rail equipment, and many of them are laying plans for the introduction of such service.

Business pending now seems to be materially in excess of the same period last year, and because of this we regard the outlook for 1927 from the standpoint of the electric railways as promising.

CARL ABELL,
Advertising Manager.

Haskelite Manufacturing Corporation

The past year has been the first year that this company has began to reap the benefits of its pioneering efforts to make its products Haskelite and Plymetl standard in the street railway field. Thirty-three companies which bought upward of 550 cars during 1926 specified Haskelite, Plymetl or both in some part of the body equipment. This does not take into consideration the numerous companies which purchased these materials for remodeling work as a substitute for products used when their cars were built. Our sales record shows a 98 per cent increase in the sale of our street car material direct to street railway companies during the past year over 1925.

JAMES R. FITZPATRICK, Secretary.

Ohmer Fare Register Company

We are just closing the best business year in our history. Our product functions with the most important factor in the transportation field, the protection and conservation of revenue. In these days of keen competition the difference between cost and selling price is what counts.

People are prone to take the line of least resistance. The popularity of the electric car is reflected by increased passengers everywhere. The electric car is generally conceded to be the best, safest and most reliable means of transportation. Nothing can compete with it for transporting large numbers of people. Additional rolling stock will be required and means for protecting the revenue are essential, for which reason we are optimistic.

I do not subscribe to the proposition that buses will be to any extent substituted for electric cars. Buses have their place and they will eventually prove to be good feeders to the electric lines, but in my opinion buses can never take the place of cars.

It is conceded generally that business will be good, at least for the first six months of 1927, but it should not be forgotten that we have established an unusual precedent which will be difficult to maintain to the satisfaction of all.

JOHN F. OHMER, President.

The Texas Company

During the present year the Texas Company has been very successful with regard to business relations with the electric street railway industry. We have had full cooperation from the American Electric Railway Association, and from all with whom we have been privileged to transact business. In fact, our relations have been very pleasant and all that could be expected. We contemplate an enlargement of business and a full year of the same pleasant relationship as that enjoyed in the past.

G. R. ROWLAND, Superintendent Lubricating Sales.

Electric Railway Equipment Company

Our railway and lighting equipment business for 1926 shows approximately 30 per cent increase over the previous year. From present indications we see no decline for the first quarter of next year. The present activity seems to be general and is not confined to any particular section.

Lang Body Company

The first half of 1926 was very good, but a slowing down became apparent in August and has continued to date. If half of the projects now under way for expansion of bus transportation should be carried out 1927 should be a very busy year for all who are engaged in manufacturing bus equipment.

E. J. LANG,
Vice-President and Treasurer.

Goodyear Tire & Rubber Company

It is our judgment that the advent and general acceptance of balloon tires for bus and truck use during the past year marked an important advance in the development of the transportation field. This development should be of even greater value to operators during 1927, bringing increased operating mileage and better patron satisfaction.

R. PRESTON. Bus Transportation Sales.

Nichols-Lintern Company

Last year was disappointing in the demand for car equipment. On the other hand, the demand for bus equipment by electric railways was even greater than had been anticipated. With full confidence in the industry we are now developing new equipment to go on the market early in the year. Most of these developments will be in the field of motor vehicle appliances. Our contacts, however, indicate to us a greater purchasing of car equipment and a lesser demand for bus equipment from electric railways for 1927.

WILLIAM LINTERN, President.

Heywood-Wakefield Company

At the rate we have been receiving inquiries from the electric railways it looks as though the coming year would be a very good one. There seems to be a real interest on the part of the railways to use more comfortable seating equipment and we are getting orders from the various railways for a type of seat far more comfortable than has ever been used.

We have even had inquiries for seats for one-man cars where the roads want to give their passengers a deep spring cushion seat in place of the hardwood seat formerly used.

G. E. CORNWALL, Assistant Manager.

The Baker-Raulang Company

The year 1926, viewed as a whole, indicates quite a decided step has been taken during that period toward standardizing on body types, sizes and equipments. With this experience as a background, we will enter the year 1927 with a more complete line of standard bodies for all types of service usually supplied by electric railway companies.

We anticipate the coming year will see a material further application of buses by electric railway interests.

E. J. STAHL, Vice-President.

Timken Roller Bearing Company

We have had the biggest business we have ever had during 1926 and we expect from all indications that this will increase during 1927. Our business of supplying bearings for gas rail cars is growing all the time and we are in a position now where our bearings are used on practically all types of this car made. During the past year several large companies have begun to install Timken tapered roller bearings on electric rail cars. In addition, for 1927 we foresee a great amount of business for our bearings in the steam railroad field as indicated by our entry into that field with an order for the bearings for 127 cars for the Chicago, Milwaukee & St. Paul Railroad.

R. P. KELLEY, Advertising Manager.

Gold Car Heating & Lighting Company

Looking back over the passing year, we may readily observe the definite advance made by the electric lines in conforming to a higher standard for their equipment and giving the public the benefit of recent improvements and inventions. In the heating end, more care is used to give sufficient and better distributed heat in better built cars.

We expect this development to continue during the coming year, and to increase. The public demands comfort and the railways are giving it to them.

E. B. WILSON,
Vice-President and General Manager.

The Readers' Forum

Mr. Ritchie Presents Bus Viewpoint

CHICAGO MOTOR COACH COMPANY

CHICAGO, ILL., Dec. 28, 1926.

To the Editor:

G. A. Richardson, vice-president and general manager Chicago Surface Lines, has been quoted at great length in ELECTRIC RAILWAY JOURNAL and other technical and lay papers concerning the proposition made by the Chicago Motor Coach Company to provide a city-wide system of motor coach transportation to serve all the people now served by the Surface Lines. Not all of what Mr. Richardson said has been included in the report in ELECTRIC RAILWAY JOURNAL of Dec. 18, pages 1105 to 1108, inclusive.

In the interest of accurate information for the public and, particularly, the street railway industry, it is felt that certain of Mr. Richardson's statements, obviously based upon misinformation, should be corrected. This may be done, perhaps, most briefly in the following form:

Mr. Richardson: "The bus company claims it can do the work of Chicago's 3,539 street cars with 4,685 buses. It would be impossible. The load is too high. It would take at least 6,500 buses at the minimum."

Answer: Mr. Richardson gives no data for his statement. Our estimate, carefully made, should be accorded more weight than his unsupported generality, which could be interpreted as saying that the job could be done with enough coaches.

Mr. Richardson: "If buses are to give city-wide service, certain things would have to be cared for—Greater frequency of service, service at all hours, greatly increased ratio of rush-hour service, reasonable headroom, pneumatic tires, air brakes, heating and ventilating, taxes and charges for paving."

Answer: Every requirement in the list has been provided for definitely, except that of pneumatic tires. When pneumatic tires are feasible, safe and dependable, the Chicago Motor Coach Company will use them.

Mr. Richardson: "The bus lines have had the cream of the traffic. They have not had to take the lean with the fat, as do the street cars."

Answer: The Chicago Motor Coach Company operated in 1925, its most profitable year, 29 motor coach routes. Of these thirteen lost money, in the sum of $229,226.43. *This is taking the lean with the fat.* In the vital traffic factors, average length of ride, diversification of business, load factor, two-way riding, and volume of business, it is the Surface Lines which have had the fat.

Mr. Richardson: "The claim that the buses would take up 22 per cent less street space than the street cars is nonsense."

Answer: This is to assert that simple arithmetic is nonsense. The figures in the following table are for the street cars owned by the Surface Lines, and for the motor coaches proposed for the new city-wide system. The relative total area occupied by street cars and motor coaches will be as follows:

Total area covered by 3,539 street cars	1,443,912 sq.ft.
Total area covered by 4,685 motor coaches	1,124,400 sq.ft.
Saving in street area by use of motor coaches	319,512 sq.ft. or 22 per cent.

Mr. Richardson pursues this line by declaring that "during the rush hour period we (Surface Lines) handle 80,000 passengers an hour in the Loop with 900 street cars. They would need 1,340 buses."

Answer: Taking Mr. Richardson's own figures (which we definitely declare as to coaches needed are incorrect) the comparison as to space occupied would be as follows:

900 street cars (48 ft. x 8½ ft.)	367,200 sq.ft.
1,340 coaches (30 x 8 ft.)	321,600 sq.ft.
Saving in area by use of coaches	45,600 sq.ft.

Mr. Richardson: "The Fifth Avenue Coach Company in New York has been able to justify using only 300 buses in the largest city in the country."

Answer: The Fifth Avenue Coach Company, in the calendar year of 1925, operated a fleet of 440 motor coaches and carried 70,654,704 revenue passengers, an increase over the year before of 9,197,584 passengers, or 13 per cent. In the year ended June 30, 1925, the street cars in Manhattan carried 161,956,000 fewer passengers than they did in 1915.

Mr. Richardson: "When the novelty wears off the public comes back to the street car."

Answer: The Fifth Avenue Coach Company in New York, which has operated gasoline motor coaches for nineteen years, carried, in the fiscal year of 1915, 14,570,000 revenue and transfer passengers. In the year ended June 30, 1925, it carried 68,426,000 passengers in Manhattan only, an increase of 370 per cent.

In Newark, N. J. (nearly 500,000 population), the street cars are carrying about two-thirds of the passengers where formerly they carried them all.

Mr. Richardson: "Last year during the Eucharistic Congress buses dropped off in number of passengers carried. This was the time of need in mass transportation."

Answers: In the week of the Eucharistic Congress the Chicago Motor Coach Company carried 1,728,258 revenue passengers, or 142,613 (9 per cent) more revenue passengers than the best week of its history. In one day there were carried 320,000 revenue passengers, or 39 per cent more than on any day in 1926.

It is believed that the proposed system can be operated at a higher scheduled speed than that of the present Surface Lines. Our checks indicate a superiority of from 5 to 8 per cent, depending upon conditions.

J. A. RITCHIE,
President Chicago Motor Coach Company.

EDITOR'S NOTE.—An extended report of the proposal to substitute buses for street cars in Chicago was printed in ELECTRIC RAILWAY JOURNAL of Dec. 18, pages 1105 to 1108 inclusive. The letter which Mr. Ritchie wrote to the City Council was printed in full. A report of the statement which Mr. Richardson released to the Chicago press was also given, together with the general developments in the situation there and abstracts of Mr. Ritchie's reply and testimony at the hearing before the Council. On page 3 of this issue there is an editorial expressing the JOURNAL'S views on the moves being made in New York and Chicago. The above letter was received just in time to be included in this issue. The JOURNAL disagrees frankly with Mr. Ritchie in the above comparison of actual street space occupied by double-deck buses and single-deck cars as a measure of their ability to move heavy passenger loads or of their relative obstruction to other traffic when operating in the streets. It is, however, glad to publish his views in its effort adequately to present both sides of this situation.

Association News & Discussions

Standardization of Plain and Lock Washers

STANDARDIZATION of plain and lock washers was discussed at the meeting of the sectional committee of the American Engineering Standards Committee on that subject held at the United Engineering Societies building, New York, Dec. 8, 1926. A report was submitted by J. Howard Horn, for the manufacturers' committee, which gave proposed standard dimensions for lock washers. After discussion of this report, it was decided that the specifications incorporated should be approved with the omission of tables of dimensions for light and heavy washers.

Various phases of the work necessary in standardizing plain washers were taken up and Charles R. Dowdy of the Wrought Washers Manufacturing Company was appointed to draw up a specification with tables of plain washers which is to be considered by the committee.

C.E.R.A. Announces Program for Annual Meeting

SUCCESS of the annual meeting of the Central Electric Railway Association to be held at Toledo on Feb. 3 and 4 should be assured by the program which has just been announced. New cars, buses, maintenance, safety and financing are the principal electric railway subjects. The program follows:

THURSDAY, FEB. 3, BEGINNING AT 10 A.M.

Welcome by Mayor Fred J. Mery.

Address of President G. K. Jeffries.

"The Permanency of Increased Revenue Resulting from New Cars," a series of five-minute talks by George MacLeod, Fredonia, N. Y.; F. D. Norveil, Anderson, Ind.; W. R. Power, Huntington, W. Va.; L. M. Brown, Indianapolis, Ind.; R. N. Graham, Youngstown, Ohio.

"Twelve Thousand New Cars Paid For Annually but Not Received," by Charles Gordon, New York City.

"Street Cars and the Next A.E.R.A. Convention," by J. H. Alexander, Cleveland, Ohio.

Discussion by Myles B. Lambert, New York City.

AFTERNOON SESSION, BEGINNING AT 2 P.M.

"The Proper Use of Buses by Electric Railways," by Walter Jackson, Mount Vernon, N. Y.

Special conference of operating executives—Subject, "More Profitable Business for the Interurbans," led by J. P. Barnes, Louisville, Ky.

ANNUAL DINNER, 6:45 P.M.

Address by W. H. Sawyer, president American Electric Railway Association.

"The Airplane in Commercial Service Today," by W. P. McCracken, Jr., Washington, D. C.

"The National Defense," by Brigadier-General D. E. Aultman.

FRIDAY, FEB. 4, BEGINNING AT 9:30 A.M.

"What Price Better Maintenance."—"Results to Be Expected from Higher Standards of Maintenance," by H. S. Williams, Detroit, Mich.

"Car Maintenance on a Production Basis," by W. T. Rossell, Pittsburgh, Pa.

"Progress Under the Hoover Safety Conference Recommendations," by Ernest Greenwood, Washington, D. C.

"Results of Reshaping the Financial Structure," by R. M. Feustel, Fort Wayne, Ind.

Election of officers.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 6-7—Midwest Electric Railway Association, midwinter meeting, Mayo Hotel, Tulsa, Okla.

Jan. 7—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

Jan. 19-20—Central Electric Traffic Association, Fort Wayne, Ind.

Jan. 21-22—Central Electric Railway Accountants' Association, Fort Wayne, Ind.

Jan. 25—New York Electric Railway Association, winter meeting, Hotel Commodore, New York City.

Jan. *26-28*—Association of Equipment Men — Southern Properties, Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

Modernizing the Electric Railway Topic of Midwest Meeting

MODERNIZATION will be the theme of the meeting of the Midwest Electric Railway Association, to be held in Tulsa, Okla., on Jan. 6 and 7.

Thursday morning's session will open with a paper by D. W. Snyder, Jr., vice-president Illinois Traction Company, his topic being "Public Relations." This will be followed by a paper by E. F. McKay, manager Oklahoma Utilities Association, whose subject will be "Public Relations."

At the afternoon session papers will be presented by R. M. Graham, manager railway division Pennsylvania Ohio Electric Company, Youngstown, on the subject "Present-Day Town and City Transportation," and Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, New York, on the subject "Can the Electric Railway Industry Afford New Equipment."

The banquet will be given at 6:30 p.m. The principal speaker will be J. F. Owens, vice-president and general manager Oklahoma Gas & Electric Company.

At the Friday morning session W. H. Sawyer, president American Electric Railway Association, will address the meeting. After Mr. Sawyer's speech there will be a business session. The afternoon will be given over to entertainment.

Southwestern Public Service Association 1927 Convention

NEW ORLEANS, LA., has been chosen as the meeting place of the 1927 convention of the Southwestern Public Service Association, to be held jointly with the Southwestern geographic division of the National Electric Light Association, April 26-29.

New York Electric Railway Association Midwinter Meeting

MEMBERS of the New York Electric Railway Association will get together for their midwinter meeting at the Commodore Hotel, New York City, on Jan. 25, 1927.

A very interesting program of subjects for discussion is being prepared.

It is requested that reservations for the dinner be mailed in to W. F. Stanton, secretary of the association, 267 State Street, Rochester, N. Y.

A.S.C.E. to Meet

ON JAN. 19-21, the American Society of Civil Engineers will hold its 74th annual meeting at the Engineering Societies Building, 33 West 39th Street, New York City. A number of papers on city planning and traffic control will be presented.

The News of the Industry

Municipal Ownership Bugaboo Reappears in Chicago

Use of the city's $45,000,000 traction fund for the purchase of the Chicago Surface Lines after the expiration of their franchises on Jan. 31, 1927, on a plan similar to that brought forward by the Lisman banking interests of New York, or on any other plan feasible under the city's bonding limitations, was suggested in a resolution submitted on Dec. 22 to the City Council by Alderman Patrick F. Ryan. The resolution directs the committee on local transportation, together with the Corporation Counsel and the committee's engineers, to give immediate consideration to the proposal.

In outlining his plan for municipal ownership, Alderman Ryan pointed out that, with the present franchises expiring in less than five weeks and with the failure of negotiations so far between the city and the companies, the traction question has again become "the subject of so much political propaganda that the condition of the public's mind on the subject is so confused that it is doubtful if any settlement with private ownership will be approved."

"We have completely failed, so far, in negotiating with the private companies," the Alderman declared. "And I believe we are bound to be fooled if we continue. The only way to protect the straphanger is to take over the lines ourselves."

The Lisman interests and the present surface lines managements, Alderman Ryan charged, are all co-operating in "one huge financial manipulation to gain control of the traction fund." He charged that the receivership move and the plan advanced by Mr. Lisman were prompted by mercenary motives.

Under the Lisman plan, extensions and improvements would be financed with $50,000,000 out of the city's traction fund, the Alderman pointed out.

If the properties can be obtained under the Lisman plan for $50,000,000, he insisted, it should also be possible for the city to acquire the properties under a similar plan.

John M. Harlan, who represents the Lisman interests in negotiations with the city, emphatically denied that the plan contained any "joker" such as refered to by Alderman McKinley. He said:

> Section 44 of our proposed ordinance, as it was read by Alderman McKinley provides that the city may purchase the new company's entire system on six months' notice by paying in cash the principal amount of the company's outstanding securities, representing capital investment, with interest to the date of purchase.
>
> Section 44 goes on to say: "In addition thereto an amount equal to the then present value of the grantee company's share of the compensation fixed and provided in section blank, to be divided between the city and the grantee company for the then remainder of the period of the grantee company's then existing permit to operate—such then present value of the grantee's company said share to be computed on the basis of an annual increase of $25,000,000 revenue passengers and an annual simple interest discount of 5 per cent for the then present payment of compensation not yet then earned."
>
> It will be seen that the additional amount the grantee company would receive by way of compensation in the event of purchase by the city would be vastly less than indicated in stories concerning that alleged "joker." And instead of being fixed and stationary—as under the 1907 ordinances—20 per cent of the capital account—would never be so large. In fact, it would grow less and less.

$2,000,000 Outlay by South Shore

Steps in advance in rehabilitation and new equipment of the Chicago, South Shore & South Bend Railroad during the past year mark it as the most important twelve-month period since the beginning of operation twenty-five years ago. More than $3,000,000 was spent in this work during 1926, in addition to the $750,000 spent in the last half of 1925, after the road had been purchased at foreclosure by Samuel Insull and associates of Chicago.

This improvement program is to be continued through 1927 and expenditures for new cars, construction and other extensions of facilities now tentatively planned call for an expenditure of approximately $2,000,000 during the coming year.

Among the improvements completed during 1926 are:

The purchase and placing in service of 25 new steel motor passenger cars.

Entire re-electrification of the railroad, including a change-over from alternating to 1,500-volt direct current, the construction of eight new electric substations, four of which are mercury arc rectifiers, and the rebuilding of the electrical overhead system.

Reballasting and laying of new 100-lb. rails between Kensington, Ill., and the Illinois-Indiana state line.

Reballasting and improvement of grades over the entire right-of-way.

Purchase of four new Westinghouse freight locomotives and general improvements in freight service, including extended sidings and team tracks.

Remodeling passenger stations at South Bend, Michigan City, Tremont, Gary and Hammond.

Several of these steps in the rehabilitation program led directly to the most important forward step taken during the year—the placing in service on August 29 of the new steel cars and through operation electrically between South Bend and Randolph Street, downtown, Chicago.

Among the new features which will be added to the company's service early in 1927 are two dining and two parlor observation cars. They are rapidly nearing completion at the works of the Pullman Car & Manufacturing Corporation in Chicago.

Law Forbids General Tax to Aid Seattle Railway

One of the various plans offered to solve the Seattle Municipal Railway's financial crisis, which has agitated the City Council of Seattle, Wash., for the past few months, was rejected recently when Corporation Counsel T. J. L. Kennedy rendered an opinion in which he held that the proposal to levy a general tax to aid in paying the bonded debt of the railway would be in violation of the state Constitution. Councilman E. L. Blaine had asked Mr. Kennedy to prepare for introduction in the next Legislature an act enabling the Council to levy a tax up to 2 mills, but this plan will undoubtedly be abandoned with the present ruling.

This leaves among the plans considered for solution of the problem two proposals—floating of a general bond issue to assist in paying off the debt. or issuing of refunding bonds, which would be railway revenue utility bonds, to retire the present bonded indebtedness, and then pay off the refund issue over a longer period than the present bond contract. For the first plan, a vote of the people would be necessary. For the second, the problem would be in finding a buyer for the refunding bonds.

In the meantime, the City Council is faced with the problem of meeting the railway department's payroll until Feb. 1, when the payment for 1927 on the purchase debt must be in the hands of the city's fiscal agent in New York. Refusal by the City Council, represented by a committee of its members, to consent to certain legislation demanded by City Treasurer E. L. Terry and Comptroller Harry W. Carroll to protect them from liability if the city fails on Feb. 1 to have on hand funds sufficient to take care of its bond obligation, these two officials have announced that the railway is immediately on warrant basis and no payrolls will be cashed. Warrants issued on the payrolls Dec. 24, Jan. 10 and Jan. 15 will be marked "not paid for want of funds," and to date no plan has been devised to meet the situation. The banks of the city have refused to cash them, and Mayor Bertha K. Landes states that she does not contemplate any further loans to the railway department from any other city departments.

In the meantime, the city is also facing the probability of having to repeal the ordinance passed on Dec. 20 increasing the interest on city money on deposit in local banks from 2 to 2½ per cent. The Seattle Clearing House Association has refused to accept city money at a higher rate than the present 2 per cent, and the city faces the prospect on Jan. 1 of having $5,000,000 with no place to bank it.

Davenport Proud of New Utility Building

United Light & Power Company Completes New Spacious and Luxurious Headquarters, Containing Offices of Tri-City Railway and People's Light Companies—Many Advantages Cited in Having Home Office in Davenport

WHILE the achievements of railway companies for 1926 are being recorded the United Light & Power Company will occupy a conspicuous position for the completion of its new home project in Davenport, Iowa, at a cost of $500,000. This headquarters building, located at Second and Perry Streets, now houses the operating, engineering, securities, purchasing, sales and other important departments of the seventh largest American public utility company.

In April of last year the public inspected the new building, which serves now as the pivot of contact between officials and patrons of the People's Light Company and Tri-City Railway. Here municipal and all local problems are solved—customers pay their bills, invest in preferred stock and purchase railway tickets, with much more satisfying results than if the central offices were located in New York, Chicago or Grand Rapids. The wisdom of having a home for the first time in Davenport is credited to B. J. Denman, general manager, who saw in the cramped rented quarters the company was occupying an impediment to its progress, and in the erection of adequate facilities right in the heart of the operating territory another milestone in the great development of this utility, of which he is the head. Officials believed that a lower cost of living for the operating staff, as well as more pleasant living conditions generally, was among the advantages to be obtained by having the headquarters in a smaller community where one of the properties was located. The erection of its own building in any large center would hardly have been possible because of high building and real estate costs. But in addition to personal gains the municipality has gained an asset in the addition of such a building to adorn the downtown district of Davenport.

A brief description of the plan of the building was published in ELECTRIC RAILWAY JOURNAL, issue of Jan. 3, 1925, page 48. The building has five stories and a basement, with a mezzanine floor, but is designed for the addition of three more floors. The exterior of the building has limestone facing the first two stories and a combination brick and stone treatment for the balance. The first floor is occupied entirely by the People's Light Company. Here are demonstrated the utilitarian purposes of this great company in the form of display counters, information desk, cashiers' counters, but in addition the æsthetic ideal is not lost sight of. The bases around all exterior walls and columns are Verde antique marble. The woodwork in the room, including paneling around sills, windows and display counters, is genuine American black walnut.

Off one lobby to the east is located the railway cashier's booth, available to the public for the purchase of tickets and other business with the railway department. These booths are of the latest bank fixture design and the floors and base in this space are of marble. The banking fixture itself is art metal finished to imitate walnut, and all paneling in connection with this room and the counter fronts is genuine black American walnut.

Large ornamental stairs in the main sales floor lead to the basement, the front part of which is devoted entirely to additional salesroom space. The mezzanine floor is connected to the first floor by a wide stairway leading to a balcony in the main sales floor, which extends across the entire east end of the same. This mezzanine floor is taken up by the accounting departments.

The second floor is given over to various United Light & Power Company officials. There are offices for the manager and assistant manager of the People's Light Company, general manager and assistant general manager of the Tri-City Railway, purchasing department, advertising department, industrial engineer, sales manager and claim department. There is also located on this floor a large assembly room, and in connection with this room are waiting rooms and a large serving kitchen.

The third floor contains the securities department, appraisal department and the executive offices. A feature of the offices on this floor is the lighting arrangement. The private offices are illuminated with Curtis indirect silver fixtures. In General Manager Denman's office four Curtis direct specially designed fixtures are used. Intensity in all offices is from 8 to 10 foot-candles.

The fourth floor is given over entirely to the engineering department. The fifth floor has been partly finished and completion will be carried on at once so that it will be ready for expansion of the various departments. The chemical laboratory is located on the fifth floor, for the purpose of carrying on research and analytical work for all the properties of the company.

Theoretically, the building was started years ago, when the Tri-City was just beginning to make strides in electrical development. Years of careful planning, use of business acumen and propagation of ethical standards laid the foundation for this structure.

Something for Davenporters to Be Proud Of

$680,000 Improvement Program for Minneapolis

The building program of the Minneapolis Street Railway, Minneapolis, Minn., for 1927 to be considered on Dec. 30 by the street railway committee of the City Council totals $680,000, with a major project the beginning of another interurban line to St. Paul. This will be a crosstown line in south Minneapolis made by extending the Oak-Harriet line on 50th Street from Penn Avenue south to connect with the Bryant-Johnson line at Bryant Avenue fourteen blocks; on the Bryant line to 42d, thence a new track to connect with the Grand Avenue line at Grand Avenue and 42d Street; also extension of the East 25th Street line across the Ford bridge to be opened over the Mississippi River, a point where the Randolph line has a terminus on the St. Paul side. By the eventual extension of the proposed 42d Street line to connect with the East 25th Street line near the west terminus of the Ford bridge a fourth interurban line will be a fact. Also there is proposed an extension of the Oak-Harriet line on Penn Avenue south to 54th Street.

Higher Fare in Petersburg and Norfolk

Quick action was taken on Dec. 21 by the Virginia Corporation Commission on two petitions of the Virginia Electric & Power Company for increased transportation rates. The decision means that the car riders of Norfolk and Petersburg will pay higher fares after Jan. 1. With the granting of higher fares the Virginia Electric & Power Company promises to give better service in both cities. This will be accomplished by changes in routes and additional equipment. Fare zones will be abolished in each of the cities.

The Petersburg application was heard Dec. 21. In that city the company will issue four tokens for 25 cents, with 7 cents as the straight fare. School tickets will be sold for 3½ cents and free transfers between electric cars and buses will be given. The present fare in Petersburg is 6 cents.

The Norfolk case, which also had the support of municipal authorities, was heard recently, but the commission withheld consent to the increase until additional documents could be presented. The new fare in Norfolk will be 10 cents cash, three tokens for 25 cents. A weekly pass will be issued for $1.50 and school tickets will be sold for 24 for $1. The present fare in Norfolk is 8 cents. Transfers will be given between the cars and buses.

Cincinnati Has New Emblem

A new insignia will appear on all cars operated by the Cincinnati Street Railway, Cincinnati, Ohio, as fast as the cars are overhauled and repainted. The new emblem pictures the street car and bus and includes the name of the company. Adoption of the insignia followed a contest conducted by the company covering a period of six months, during which 350 designs were submitted. A combination of six designs, however, afforded just what was desired and the $50 offered for the winning insignia was divided among the six contestants. The new insignia will also be used on uniforms, buttons, badges and advertising of the company.

In commenting on the contest, Hudson Biery, Director of Public Relations, said that many of the designs used words describing the advantages of street railway service. These were not used as the company felt that the service must speak for itself. He said: "We want the car and the coach and the words 'Cincinnati Street Railway' finally to become known to the public eye as standing for good service."

Boston Electrification Not Favored

The Metropolitan Division of Planning, Boston, Mass., has disapproved the proposed plan for the electrification of the Saugus branch of the Boston & Maine Railroad between Everett and West Lynn, because of its prohibitive cost. In its report to the Massachusetts Legislature the planning board has suggested that the branch be electrified for overhead operation. This plan would do away with a proposed underpass at the railroad. This project would cost far less, outside of new rolling stock, and would be an asset to the development of the territory served. Opportunities are numerous for real estate subdivisions over the line, as well as industrial plants. In order to accomplish this end co-operation would necessarily have to exist between the railroad and the railway. The Boston & Maine would abandon passenger service and the Eastern Massachusetts Street Railway would take care of that end. Regarding the operation of trolley cars, half-hour headway was recommended with more frequent service during rush hours. The Boston & Maine would continue to operate freight trains over the Saugus branch, which would not interfere with trolley traffic.

Would Draft New Franchise for Omaha

A movement is on foot to draft for submission at the May election a new franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb., to take the place of the one shortly to expire. The voters refused their approval some months ago to the franchise asked for by the company. The present suggestion is that John P. Breen, attorney in charge of the opposition at the last election, and others competent to do so draft a grant that will embody conditions they think the city should include in a new offer.

The principal objections to the franchise defeated were that it ran for too long a period, that it exempted the company from all share in the burdens of paving and also relieved it of occupation taxes. Mr. Breen says that he is not opposed to a renewal of the franchise and that he is opposed to municipal ownership at this time. He adds that it is plain that it is in the interest of the city to pass a new grant.

If one can be drawn acceptable to the company it is possible to submit it in May and give the company an opportunity to refinance by Jan. 1, 1928.

Stopping Service To Serve

YESTERDAY morning an elderly woman stood midway on a Grand Rapids street made slippery by sleet and rain. She had made the crossing half way, when traffic began to increase, and she dared not trust her unsteady feet for a quick dash in front of swiftly moving automobiles. A motorman, keen of eye and sympathetic of heart, had, however, seen her a half block away. He stopped his street car, helped the old lady across the street and resumed his post.

Probably the passengers who failed to witness the episode, grumbled at the delay, as passengers will when service is interrupted. But not one of them, knowing the facts, would remonstrate a syllable against delay for such a reason. When service becomes a Frankenstein to which the humanities must give way, it ceases to be service at all. *Grand Rapids Herald.*

Community Day in Wheeling Featured by Free Rides

Another wholesale purchase of railway service was witnessed—this time in Wheeling, W. Va., when on Nov. 12 the first community day was held. Approximately 50 merchants in the city of Wheeling purchased the railway service inbound between the hours of 9 a.m. and 12 noon. When passengers boarded the cars during the morning they were handed cards reading "Good morning, you are the guest of George E. Steifel Company, which is this morning beginning its 48th anniversary sale."

During the day 21,000 people rode to the city on street cars and 15,000 of them came during the three-hour period as guests of the merchants. The merchants estimated a total of 25,000 visitors to the stores and business took on the aspects of a Christmas rush. Not only did the stores profit by large sales but restaurants and theaters enjoyed capacity crowds during the afternoon and evening.

In commenting on the matter editorially, the Wheeling *Register* said in part:

> To put it tersely, community day went over bigger than expectations warranted. The occasion will not be of temporary benefit to Wheeling merchants and out-of-town shoppers alone. It will form a contact between the two that will bring satisfied customers to the city next week and weeks to come.

It is understood that Wheeling merchants and business men are so well pleased with the success of the first community day that it is to be repeated at frequent intervals.

Pasadena Loses in Fare Issue

The Supreme Court of California has denied two petitions for writs of review on the part of the city of Pasadena against the Railroad Commission in which the city of Pasadena contended that the Railroad Commission was without jurisdiction to regulate the rates and services of motor coach lines operated by the Pacific Electric Railway in that city. Those cases arose out of applications on the part of the Pacific Electric Railway for increases in fares over those motor coach lines. It was the position of the city of Pasadena that since those lines were operated under contract with the city and pursuant to a franchise which it had granted, and since the Railroad Commission was not given authority over motor vehicle operations solely within the limits of municipalities, the commission had no authority to consider the question of rates for this service. In its answer to the Supreme Court, the Railroad Commission pointed out that one of those lines extends for a short distance outside the city of Pasadena, and contended that unless operations were conducted exclusively within the city limits the commission possessed authority over the entire operations.

The Supreme Court's decision denying the writs of review asked by the city of Pasadena in effect sustains the position of the Railroad Commission, and the effect of the cases is to hold that the commission does possess complete authority over motor vehicle operations such as are conducted by the Pacific Electric Railway in Pasadena.

Large Downtown Terminal in Chicago for North Shore

A passenger terminal much larger and more attractive than the old one was recently opened to the public by the Chicago, North Shore & Milwaukee Railroad in the downtown section of Chicago.

The new station occupies the entire basement, first and second floors of an eight-story office building. A ticket window, information booth and checking counter occupy the front of the first floor, where large walnut benches provide comfortable waiting facilities for travelers. The rear of the first floor is occupied by a restaurant and lunch counter operated by the North Shore Line's commissary department and is equipped for prompt and adequate dining service. The entire main floor is finished in marble and walnut with brass fixtures.

In the basement there is a commodious smoking room for men, while on the mezzanine floor, at the first landing of a broad marble staircase, may be found the ladies' waiting and rest room, a handsome suite equipped with upholstered furniture.

The second floor provides an additional ticket window and chairs for waiting passengers. At the rear are show windows where displays of household furnishings add to the cosiness of the surroundings. A second story bridge connects the upstairs waiting room with the Adams Street elevated station, where passengers may board all North Shore Line trains.

A system of electric amplifiers is used to announce the arrival of trains loudly and clearly throughout all parts of the station. Illuminated signs direct passengers to all points of service. The new station will serve as a model in future development of all North Shore Line terminals.

Construction of Maine Project Awaited

The consent of A. R. Graustein, president of the International Paper Company, to allow United States Senator Arthur R. Gould of Presque Isle, Me., to cut timber in the company's holdings across northern Maine is all that is necessary for the building of the proposed electric railway through the woods of northern Maine into the Province of Quebec. The certificate granted by the Interstate Commerce Commission for construction lapses Dec. 31 and cannot be renewed. Mr. Gould has stated that the syndicate had been organized and that work would be started as soon as the question of this permit was settled. The Gould project will be 111 miles in length, running straight across Maine from Washburn in Aroostook to Lake Frontier to connect with the Quebec Central and it will be wholly through virgin territory, opening up new land for farming.

More than a year ago an investigating committee recommended to the Interstate Commerce Commission the construction of 111 miles of electric railroad in Aroostook County, Me. At that time it was said that the new line would be known as the Quebec Extension Railway. The estimated cost was $4,000,000. Later a tentative report of the Interstate Commerce Commission by examiners opposed the project. This Maine project has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

News Notes

Children's Rates Adjusted.—The California Railroad Commission has dismissed the application of the Santa Barbara & Suburban Railway, Santa Barbara, Cal., for authority to readjust special rates for school children. The matter was adjusted informally.

Kiwanis Club Honors Railway Man.—C. D. Smith, general manager of the Beaver Valley Traction Company, New Brighton, Pa., was elected president of the Beaver Falls Kiwanis Club at its recent meeting. The club was addressed by Judge W. A. McConnel, who discussed the "Underprivileged Child."

One-Man Cars Allowed.—The Public Service Commission recently granted permission to the Eastern New York Utilities Corporation, Albany, N. Y., to use new light-weight one-man safety cars. Evidence submitted to the commission showed that in 1922 the company operated with a deficit of $50,542; in 1923, $32,400; 1924, $39,093; in 1925, $54,501, and for the first ten months of 1926, $79,270.

Hot Time Promised in Baltimore.—Following complaints filed with the Maryland Public Commission, the United Railways & Electric Company, Baltimore, has agreed to increase the minimum temperature in its street cars from 40 to 45 deg. The commission passed an order calling for the 45-deg. minimum. The minimum of 40 deg. was established by the commission in 1916. New thermostat controls made necessary by the change are being installed as well as thermometers "to disprove charges of arctic temperatures."

Transit Aides in Conference.—City Solicitor Gaffney of Philadelphia, Pa., has assigned John B. Gest, an assistant city solicitor, to investigate the protests against the curtailment of service and operating policies of the Philadelphia Rapid Transit Company which were turned over to him by Mayor Kendrick. George L. Bright, special statistician and traffic engineer of the department of transit, will aid Mr. Gest in his work.

Extension Matter Up in St. Paul.—Extension of the Snelling Avenue line of the City Railway, St. Paul, Minn., ½ mile is to begin in the spring, as the company does not believe the court which ordered the extension will require construction in winter. The order is under an ordinance adopted by the city Dec. 30, 1924. The company contended that the extension would add about $18,000 to annual cost of operation without any substantial increase in revenue. Judge Charles Bechhoefer of the Ramsey District Court held the Council ordinance is a proper exercise of authority to compel necessary service. The company has forty days to appeal to the State Supreme Court.

New Disposition of Old Cars.—The Georgia Railway & Power Company, Atlanta, Ga., instead of burning its obsolete equipment has given away two of its cars to Frank Dabney and Frank Neely, Atlanta. More than twenty applications were received for the first two cars to be advertised. Mr. Dabney will set up his car in his front yard where it will be used as a meeting place for Boy Scouts and community ladies' clubs. Mr. Neely will present his car to a local orphans' home for a playhouse.

Plans Service Improvements.—A survey of the properties of the Macon Railway & Light Company, Macon, Ga., is now under way under the supervision of Horace Fligg, transportation engineer of the Atlanta office of the Georgia Light, Power & Railways Company, which controls the Macon property. It is expected that a considerable amount of new equipment will be installed.

Railway Man Honored.—Frederic H. Hill, vice-president and general manager of the Elmira Water, Light & Railroad Company, Elmira, N. Y., was recently elected president of the Association of Commerce to serve during the current year. In addition to his important position as vice-president and general manager of the Elmira property, he is associated with every local civic movement. The Elmira Advertiser of Dec. 21, commenting on his election, said that the saying "If you want something accomplished, get a busy man," was exemplified in the selection of Mr. Hill.

Time Extended on Freight Hauls.—The Salt Lake & Utah Railroad, Salt Lake City, Utah, will be allowed to participate in westbound transcontinental freight hauls until Feb. 12, 1927. The extension of time was granted the road by the Interstate Commerce Commission until it has time to make the final decision on the case to determine whether the railroad can participate in westbound transcontinental freight business. W. C. Orem, former president and now assistant to the receivers of the line, in explaining that the Salt Lake & Utah could not participate as an intermediate carrier in eastbound transcontinental freight hauling, pending the final decision, said it was apparent at the oral arguments before the entire commission at Washington that there was a discrimination against the Orem line and his company hoped for a favorable decision.

Skip-Stop Issue to Be Heard.—The committee on railways and franchises of the Baltimore City Council has postponed action on a resolution which has been introduced requesting the Maryland Public Service Commission to order the United Railways & Electric Company to discontinue the skip-stop system in operation in the morning and evening rush hours. The committee held a hearing on the subject on Dec. 20, at which several persons opposed the skip-stop. Philip B. Perlman, former City Solicitor of Baltimore, represented the United. He pointed out that the Public Service Commission had not concluded its investigation of the complaints it had received against the plan and for this reason the committee postponed action until Jan. 10.

Recent Bus Developments

Equitable Coach Favored

Bus Grants in New York to Be Considered Jan. 15—New York Railways Modifies Petition

A majority of the members of the Board of Estimate, New York City, N. Y., is said to have agreed on the awarding of franchises for bus operation in Manhattan, Brooklyn and Queens to the Equitable Coach Company. It is believed that the preliminary award will be made before Jan. 15. It must then be followed by four weeks of advertising and confirmed by the Transit Commission by the grant of a certificate of convenience. At the same time the board will grant a bus franchise for operation in the Bronx to the Surface Transportation Corporation, a subsidiary of the Third Avenue Railway. As far as Richmond is concerned, it is said that an attempt to award a franchise will be made soon after the franchises for the four other boroughs are finally determined.

The agreement was reached on a 5-cent fare zone basis. Long routes will be divided into 5-cent fare zones. In Manhattan, Brooklyn and Queens the Equitable company will charge 2 cents for transfers between intersection lines in the same zone. In the Bronx the Surface Bus Corporation will give free transfers between intersecting lines in the same zone. Each company will pay the city 3 per cent of the gross receipts from operation. The duration of the franchise will be for ten years with privilege of renewal for another ten years if operation is satisfactory to the city administration.

The Equitable Coach Company will operate 352 buses in Manhattan, 224 in Brooklyn and 196 in Queens. Its total investment for bus operation will amount to approximately $15,000,000. The equipment will include both single-deck and double-deck buses. The Surface Transportation Corporation will operate 81 buses in the Bronx with a total investment of about $1,500,000. It is expected both companies will begin the construction of garages and place orders for new equipment as soon as the franchise contracts are signed.

The sponsor of the Equitable Coach Company project is J. G. White & Company, Inc. According to the company's application that banking firm is responsible for both the financing and management of the Equitable Coach. Different groups of capitalists are mentioned as being interested in the Equitable project, but no definite information on this aspect of the situation is available.

The award agreement followed fast upon the statement of Mayor Walker that if no award on bus franchises were granted soon he would introduce a resolution to award the franchise at an open meeting. He said that there had been an unreasonably long delay since the bus report of the Board of Transportation more than three months ago. City authorities expected opposition by existing transit companies on the ground that some of the routes proposed by the Board of Transportation would compete with existing surface and bus lines. The Mayor has been told that he will receive up-state support in any attempt to eliminate the legal requirement for the issue of certificates of convenience and necessity by a state body, such as the Transit Commission or Public Service Commission, and to give each city in the state "home rule" in transit matters, including the establishment of new bus routes.

Following publication of the statement that a majority of the Board of Estimate had decided on the award just mentioned the Manhattan Surface Coach Company, affiliated with the New York Railways Corporation, sent a letter to the Board of Estimate on Dec. 28 amending its application for a Manhattan bus franchise by offering terms more favorable to the city than those in its earlier applications. It offered a 5-cent fare zone system exactly like that proposed by the Equitable Coach Company. In addition it offered to give transfers for 2 cents each to intersecting surface lines of the New York Railways system and asked a franchise for only four years. This letter, signed by H. J. Sheeran, president, follows:

> On May 19, 1926, the Manhattan Surface Coach Company, a subsidiary of the "New York Railways Corporation," amended its application No. 1 for a franchise to operate buses in Manhattan to provide for a 5-cent zone fare system. The zones proposed and the fare proposed by the Manhattan Surface Coach Company were in all respects exactly identical with those proposed by the Equitable Coach Company in Manhattan, excepting that the latter company proposed no zoning on First or on Park Avenue.
>
> We now propose to further amend our application No. 1 for a franchise to operate buses in Manhattan so as to make the fare to be charged and the zones to be established in Manhattan exactly similar to those proposed by the Equitable Coach Company in its several petitions dated Nov. 18, 1925; Feb. 13, 1926, and June 21, 1926.
>
> In addition, we further amend our application No. 1 so that in addition to the transfer privileges set forth in the proposal of the Equitable Coach Company, all of which we hereby incorporate in this amended proposal, we will also provide for the exchange of transfers upon the payment of 2 cents at all intersections of the proposed bus routes with the existing railway lines of the New York Railways Corporation, so that a passenger, upon the purchase of a single transfer for the sum of 2 cents, may have the alternative of using that transfer on either an intersecting bus line of the Manhattan Surface Coach Company or an intersecting trolley line of the New York Railways Corporation.
>
> Thus our application is more favorable to the city and the public than that of any other company, as no other company is in a position to give this interchangeable service.
>
> We further point out that we have applied for a franchise for only four years, with a privilege of renewal for a further term of four years, as against a ten-year application of the Equitable Coach Company, with a right to renew for ten years.
>
> As to our financial responsibility, we, together with the Fifth Avenue Coach Company, which will assist in the financing and operation of the system, have today on hand or in bank $4,200,000 in cash and liquid securities and have ample resources worth many millions of dollars and ample credit to permit us, without any further financing of any kind, to establish the system.
>
> We are able to put a complete bus system into operation immediately and will have the personnel, garages already established and experience of the Fifth Avenue Coach Company to draw upon.
>
> The New York Railways Corporation has been in existence in New York many years and has millions invested in its properties on which its security holders have had but scant return. Last year it carried approximately 146,000,000 passengers. To award the bus franchise to an outside company and divert millions of passengers away from it would further very materially cripple the road and its ability to be of service to the public. It has now under way a rehabilitation program calling for the expenditure of upward of a million dollars, and if given a fair opportunity will do its best to enlarge that program.
>
> The New York Railways Corporation has no interest whatever or any affiliation with any other surface car lines or rapid transit lines in New York City, and none of its stock or the stock of its affiliated companies is owned or controlled by any existing surface lines or rapid transit lines in the City of New York or by any of the persons in control of those companies. It is an entirely independent transportation agency.
>
> We feel that our company with its large investment and extensive operation, which it has labored so hard to maintain in the face of increasing difficulties, is entitled to and will receive the utmost consideration from those who are safeguarding the interests of the people, both who use these lines and whose investments lie in these properties.

Receiver for Purple Swan Line

The Purple Swan Safety Coach Lines, Inc., operating in and around East St. Louis, Ill., has just been placed in temporary receivership. Circuit Judge Calhoun appointed William H. Schaumberg, an attorney, to the post. A hearing on a permanent receivership will be held on Jan. 6. Allegations were made that the company had outstanding debts of more than $250,000. The company has expanded rapidly since last June and now is carrying an average of 2,000 passengers a day. Its main lines emanate from St. Louis to Kansas City, Chicago and Indianapolis. The president is J. H. Darlington, Louisville, Ky. As indicated in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 13, 1926, page 905, some of the Purple Swan lines were operated in competition with the Blue Goose line, owned and operated by the East St. Louis & Suburban Railway.

Railway's Subsidiaries in Baltimore Consolidate

Under the provisions of an order passed by the Maryland Public Service Commission, the four bus companies in Baltimore controlled by the United Railways & Electric Company have been consolidated under the name of the Baltimore Coach Company. At the same time the commission authorized the newly organized company to issue 5,000 shares of common stock without par value and granted permission for the United Railways & Electric Company to acquire all the capital stock so to be issued in exchange for all the shares of stock in the four companies which go to make up the new concern.

The change means the consolidation of the bus lines operated by the United into one concern controlled by the railway. The four consolidating companies are the Baltimore Transit Company, the City Motor Company, the East Fayette Street Bus Company, Inc., and the Baltimore Bus Company.

Bus Bill Planned by Louisville

Regulations similar to those proposed two years ago will be written into a bill for jitneys, buses and other transportation conveyances, it was said recently, by the Public Utilities Bureau of Louisville, Ky. The measure would be substituted for the bill introduced a short time ago in the General Council.

The new bill would require registration of jitneys and their drivers, ownership including the number of persons having financial interest in the transportation concern; would require a declaration of the rate of fare, the routes to be operated on and the terminals; would demand the establishment of a fixed schedule and other operating points.

The bill also would demand a blanket insurance of $50,000, it was said, provided the jitney owners establish an organization, or $2,000 for each operator provided the blanket license cannot be arranged. The jitneys would be placed under the Board of Public Works. Permits, which would have to be obtained, could be revoked for cause, such as conviction of traffic laws or other laws, and would establish other minor regulations.

Bus Activity of Great Northern Curtailed

The Northland Transportation Company, a bus subsidiary of the Great Northern Railway, has been given conditional permission by the Minnesota Railroad and Warehouse Commission to discontinue through bus transportation between Minneapolis and St. Paul Jan. 1, 1927. This service was operated at a heavy loss. It is provided that the company enter into an operating arrangement with other bus companies for transferring and transporting all incoming and outgoing passengers between St. Paul and Minneapolis holding tickets to the other cities on scheduled vehicles of the Twin City Motor Bus Company, Jefferson Highway Transportation Company and the Twin City & Southern Bus Company.

This removes fifteen buses leaving St. Paul and twelve from Minneapolis, and leaves ten from Minneapolis and nine from St. Paul. Pick-up service between the Twin Cities is permitted the Twin City Motor Bus Company only, so that the Northland company gained no revenue from this source. Notwithstanding strong protest by St. Paul business interests, the commission found the service which is to be discontinued not required by public convenience and necessity.

Chicago Bus Hearing Continued

A new type of bus, designed to be used in Chicago, Ill., if the Chicago Motor Coach Company secures a franchise from the city for city-wide operation, was described to Alderman John Toman's sub-committee of the City Council's local transportation committee at the hearing on Dec. 21. As a result the committeemen decided to visit the coach company's plant and inspect the new vehicle. So the meeting adjourned to Dec. 28 after John A. Ritchie, president, and James G. Condon, attorney of the motor coach company, had answered questions from the committee members.

Gary Railways Asks Right to Operate Additional Bus Lines

Permission to establish a new de luxe type of motor coach service on Broadway, Gary, Ind., between 52d Avenue and the New York Central station, was asked on Dec. 16, in a petition filed with the Indiana Public Service Commission at Indianapolis by the Gary Railways. The plan as set forth in the company's petition is in answer to repeated requests from residents of the far south side of the city for faster and more comfortable service to the downtown district. In case the authority is granted by the commission, the company proposes to put into immediate effect an hourly limited stop service between these two points. The schedule is arranged primarily to afford convenient connection with all South Shore Line express trains for the Chicago Loop. For this superior type of coach service a fare of 15 cents is contemplated. No transfers will be issued.

In another petition filed with the commission the Gary Railways seeks permission to extend its present coordinated bus and railway service into the southwest portion of the City of Gary, many blocks in which are now without adequate transportation. The purpose of this project, as stated in the petition, is to place all homes in that section within a quarter of a mile or less of either street car or bus service. This new coach service would be provided with the present city-type of bus between 6 and 9 a.m. and 3 p.m. and 7 p.m. A 10-cent fare will be charged and transfers will be issued and accepted to and from connecting trolley and coach lines of the company.

Would Operate Buses.—The Tennessee Electric Power Company recently asked permission of the State Railroad and Public Utilities Commission to operate buses on the streets of Chattanooga, Tenn. The commission took the request under advisement. The city of Chattanooga and Hamilton County have already approved the terms under which the company proposes to install the service.

Reports Unfavorably on Bus.—A proposal from the York Township Council that the Toronto Transportation Commission provide a bus service in the Silverthorn district was reported upon unfavorably by D. W. Harvey, general manager of the Toronto Transportation Commission, because of the lack of patrons. The township Council decided to ask the Toronto Transportation Commission for a report on what the probable loss would be on such a service with a view to having it established if the loss would not be too great. Mr. Harvey also reported unfavorably on a proposal to replace car service by bus service on Lambton Street car line between West Toronto and Lambton, a distance of 1 mile. He claimed the change would mean financial loss to the township, which would have to continue paying charges on the car line whether or not it was operated.

Buses Substituted.—The Pubilc Service Commission on Dec. 14 authorized the Westchester Street Transportation Company, Inc., to substitute buses for cars upon tracks on a portion of its route in the city of White Plains, from the New York Central tracks on Main Street in White Plains, N. Y., to the dividing line between the village of Scarsdale and the city of White Plains. The White Plains situation was reviewed in the Third Avenue Railway report.

Would Extend Line.—The Key System Transit Company, Oakland, Cal., has applied to the Railroad Commission for a certificate to operate bus service as an extension of its Fernside bus line from the intersection of East Fourteenth and High Streets to the intersection of Ygnacio Avenue and High Street, Alameda County.

Buses Supplement Railway Service.—The Kentucky Utilities Company has recently placed three large buses in service in Paducah, Ky. This service supplements the present local railway system of the company.

Reports Favorably on Buses.—The Lincoln Traction Company, Lincoln, Neb., reports satisfactory experience with the buses it has been operating for some weeks as a substitute for and a complement to railway service. During the first two weeks of operation of the bus line to the state penitentiary, located in a suburb 4 miles from the business center, the revenues were $446 and for the second two weeks, $606, an increase of 35 per cent. Weather conditions were about the same as last year, and the number of persons hauled was about the same as the railway carried a year ago. On bus lines operated to the Agricultural College and University Place, northeast suburbs, the first eight days of operation brought revenues of $462, and the next eight days, $552, a 20 per cent increase.

Commission Order Calls for Buses.—The Public Service Commission has approved the petitions of the United Traction Company asking for the abandonment of portions of its route in the city of Rensselaer, N. Y., on Broadway and Aiken Avenue and also the Third Street line. The orders of the commission provide that the United Traction Company, on direction of the Common Council of the city, remove all of its existing structures from the streets affected and restore the portions to as good condition as the adjoining parts of said streets are at present. These orders are not to take effect unless and until the United Traction Company files with the commission an agreement to the effect that, by and with the consent of the city of Rensselaer and of the commission, transportation will be furnished to the territory now served by the portion of the route to be abandoned by means of buses with the same rate of fare and transfer privileges as are in force on the railway, and with an interval of service not greater than that which is now maintained on the Broadway and Aiken Avenue line and on the Third Street line.

Financial and Corporate

Surplus of $94,031 on New York State Lines

The report on operation of the Rochester lines of the New York State Railways for the year ended July 31 last, submitted to Mayor O'Neil and the Common Council on Dec. 14 by Commissioner of Railways Charles R. Barnes, shows a surplus of $44,897 above the return provided in the service-at-cost contract between the railways and the city. A surplus of $94,031 is shown in street car operations and a deficit of $49,134 from bus and trackless trolley operations. The balancing fund which regulates the rate of fare showed an accumulated deficit of $281,338 as of July 31.

Commissioner Barnes in his report emphasized the steady decrease in passenger revenue owing to the increased use of the automobile and pointed to the increased expenditures because of pavement repairs and new paving, in addition to track renewals.

Passengers carried during the year totaled 95,499,202, a decrease of 2,333.395 over the preceding year. While trolley riders declined by 2,619,673, passengers on buses and trackless trolleys gained by 286,278. The fewer car riders were served by 132,764 more car-miles than in the previous year. The operating system, according to the report, now embraces 169.14 miles of railway trackage, 2.75 miles of trackless trolleys and 53.55 miles of bus routes.

Anent the automobile problem, the commissioner said that the trolley system was naturally affected more seriously and adversely than any other agency by the problems arising from the increased use of the automobile, especially in the business section. The problem was new and one born of modern conditions, and thus far it had not been met successfully. Free movement of street cars as well as the safety and convenience of automobile riders required and would require, in the future, an increasing amount of careful and earnest attention.

Regarding paving costs, Commissioner Barnes said it was well known that where new paving was laid in the city street or where repaving took place the cost of paving within the operating strip and 2 ft. outside on either side was borne by the transportation system. He referred to the general injustice of that situation, due to the fact that this paving surface was used entirely by automobiles and not by street cars. It was felt the Legislature ultimately would adopt corrective measures.

SUMMARY OF REPORT OF ROCHESTER LINES

	Railways	Bus Lines	Combined
Revenues from Transportation:			
Passenger revenues	$5,128,665	$88,235	$5,216,901
Chartered car revenues	2,700	......	2,700
Bus rentals	......	906	906
Mail revenues	82	......	82
Miscellaneous transportation revenues	2,062	127	2,190
Total revenue from transportation	$5,133,511	$89,269	$5,222,780
Revenue from other railway operations:			
Station and car privileges	$55,167	......	$55,167
Rent from tracks and facilities	37,453	......	37,453
Rent from buildings and other property	14,771	....	14,771
Total revenue from other railway operations	$107,391	....	$107,391
Total operating revenues	$5,240,902	$89,269	$5,330,172
Operating expenses:			
Way and structures	$474,883	$1,484	$476,367
Equipment	367,868	27,774	395,643
Power and gasoline	284,229	11,356	295,585
Conducting transportation	1,699,268	34,359	1,733,627
Traffic	14,416	3	14,419
General and miscellaneous	551,444	32,201	583,645
Renewals and depreciation	215,000	19,401	234,401
Total operating expenses	$3,607,110	$126,580	$3,733,691
Net operating revenues (deficit)	$1,633,791	$37,310	$1,596,480
Auxiliary operating revenues	$3,023	....	$3,023
Auxiliary operating expenses	3,776	....	3,776
Auxiliary operating deficit	$753	....	$753
Net revenue—All operations (deficit)	$1,633,037	$37,310	$1,595,726
Taxes assignable to operations	375,691	1,469	377,160
Operating income	$1,257,346	$38,779	$1,218,566
Non-operating income	10,261	....	10,261
Gross income	$1,267,607	$38,779	$1,228,827
Return on investment	1,173,575	10,354	1,183,229
Service-at-cost operating surplus or deficit	$94,031	*$49,134	$44,897

* Deficit.

New York Companies Merged

The Eighth & Ninth Avenue Railway, New York, N. Y., formed by consolidation of the Eighth Avenue Railroad and the Ninth Avenue Railroad, has been chartered at Albany with 58,000 shares non-par value. Joseph Tate, Plainfield, N. J.; William Henry Hays, New York City, and James G. Affleck, Yonkers, N. Y., are directors and subscribers. Michel Kirtland, New York, is attorney.

The joint petition for the consolidation was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 18.

$8,672,135 Probable Expense in Cincinnati

The estimated expense for the operation of electric cars and motor coaches by the Cincinnati Street Railway, Cincinnati, Ohio, in 1927 aggregate $8,672,135. The budget of the company has been approved by Edgar Dow Gilman, Director of Utilities, with two reservations.

The budget shows a probable loss of approximately $126,000 in the operation of buses, and on that point the director says, "steps will be taken as soon as practicable so to change the condition as to make motor coach operations more nearly self-supporting." It was indicated that certain lines which parallel railway routes may either be discontinued or the fare increased so that the deficit in their operation will not be charged to the electric car riders. Mr. Gilman also comments upon the fact that no allowance is made in the budget for depreciation. It is understood, he said, that it is the purpose of the company to refund the Cincinnati Traction Company equipment trust certificates falling due in 1927 by the issuance of other securities as is provided for in the franchise. This is not in accordance with the policy of the director that the basic principle to be observed in making proper charges is to keep the capitalization as nearly as possible equal to the physical value. The refunding of these certificates does not reduce the liability of the company and the capitalization remains constant, although there is a continued depreciation in the physical value. The operating expenses as indicated in the budget are as shown in the accompanying table.

CINCINNATI STREET RAILWAY
OPERATING EXPENSES

Way and structures	$ 926,122
Equipment	797,135
Power	951,472
Conducting transportation	2,990,438
Traffic	42,600
General and miscellaneous	631,481
Total	$6,339,248
Rental of viaducts	6,500
Taxes	734,798
Fixed charges	403,492
Return on capital	1,188,097
Total	$8,672,135

Chicago City Railway Hopes to Escape Receivership

Less than 24 hours after the Chicago Railways had passed into the hands of receivers Leonard A. Busby, president of the Chicago City Railway addressed a letter to the local transportation committee of the City Council in which he announced his company's willingness to accept a six months extension after Feb. 1, on whatever terms the city chooses to make. Mr. Busby made no direct comment on the receivership of the Chicago Railways. In illustrating his contention that a receivership for the south side lines would not be warranted, Mr. Busby pointed out that the Southern Street Railway—one of its component parts—had no indebtedness of any kind and that the present earnings of the other two units of his lines compared with their bonded indebtedness created a favorable situation. Although the first mortgage bonds of these properties mature on Feb. 1, most of them have been deposited with protective committees which are a unit in not desiring a receivership, he said.

In expressing his willingness to negotiate with the city for an ordinance covering the extension, Mr. Busby said in his letter:

> I consider this step necessary and desirable, both from the standpoint of the public and the security holders. The six months period will enable the city and the companies to complete their existing negotiations and will also give the city an opportunity to procure enabling legislation at the next session of the Legislature which will be necessary to make effective the ordinance now being drafted for a unified and comprehensive transportation system for the city.
>
> Speaking for the south side lines, I wish to advise that we will accept an extension of our present ordinances for a period of six months.
>
> With reference to a receivership for the south side properties, we desire to advise that it is the intention of the management of the various protective committees representing security holders to do everything in our power to prevent a receivership following the maturity of some of our securities next February. We feel that if the holders of these securities co-operate with us by depositing their securities we will be able to avoid a receivership.

One-Third of P.R.T. Stock Owned by Employees

The co-operative wage fund trustees of the Philadelphia Rapid Transit Company, Philadelphia, Pa., purchased 25,000 shares of the company's stock during 1926 at a cost of approximately $42 a share after crediting dividends received and paying four quarterly dividends. This statement was made by President Hauseman of the association in *Service Talks* of Dec. 17, 1926. The total company stock in possession of wage fund amounts to 221,500 shares, which added to 10,000 shares of co-operative association gives employees ownership of one-third of their work shop. A co-operative wage fund participation certificate similar to those issued for the years 1922 to 1925 will be given early in 1927 to each employee certifying the number of shares of P.R.T. stock represented by the amount of his 1926 co-operative wage and held in trust by the co-operative wage fund trustees who will vote the total amount of 221,500 shares at the stockholders' annual meeting next March. President Slook of the co-operative association saving fund said that the company's saving fund had just passed the $2,700,000 mark, an increase of $100,000 for the year, and now has 11,202 depositors, the largest number.

W. R. Smith was elected president of the saving fund for 1927 and James Shivers vice-president.

Commission Approves Sale.—Formal approval by the Indiana Public Service Commission of purchase by the Fort Wayne-Lima Railroad of the Fort Wayne, VanWert & Lima Traction Company, recently bid in at a receiver's sale at approximately $150,000, was asked in a petition filed with the commission by the former company. The petition also asked approval of $100,000 in first mortgage bonds, $441,000 in general mortgage bonds and 10,290 shares of no par value stock. Reference to the sale of the property was made in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 11, 1926, page 1070.

Director Elected at Nashville. — James E. Carnes has been elected a director of the Nashville Railway & Light Company, Nashville, Tenn. He started with the corporation as messenger, and rose to the post of assistant to the vice-president.

More Money to Meet Indebtedness.—The California Railroad Commission has authorized the Key System Transit Company, Oakland, Cal., to use the proceeds from the sale of $777,161 of its first mortgage 6 per cent bonds, to pay indebtedness, instead of $770,161 as heretofore authorized.

Net Income Lower. — For the five months period ended Nov. 30, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $4,687,521, against $4,687,117 for a similar period in 1925. Operating expenses and taxes showed a slight increase, being $4,011,721 for the five months ended Nov. 30, 1925, and $4,030,775 for the five months of 1926. After the consideration of income deductions, the net income for the 1926 period was $530,821, against $574,741 for the 1925 period.

Would Discontinue Last Trolley Line.—The City Council of Westfield, Mass., will take no action until 1927 on the petition of the Springfield Street Railway asking for permission to discontinue the one remaining trolley line in the city. No action by the bus license committee is expected, and as the railway plans to substitute bus service the matter will be shelved for the time being. A short time ago the Springfield Street Railway was granted licenses to operate several bus lines in Westfield, but experienced some difficulty in securing licenses. The service supplied by the bus lines since then has been excellent.

Would Discontinue Line.—The Portland Electric Power Company, Portland, Ore., recently filed a petition with the Public Service Commission asking permission to discontinue service on the Montavilla-Ruby Junction-Troutdale division of its lines. The company declared that this division was not profitable and that the deficit for the year 1925 was approximately $34,750; for the first ten months of this year the deficit was $34,074. It was also pointed out that the line was now in such a state that to continue it would require from $20,000 to $25,000 for roadbed and equipment repairs. If the petition was granted the company would care for its freight business through other connections.

Net Income Higher. — For the five months period ended Nov. 30, 1926, the total operating revenue of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $19,360,241, against $18,636,972 for a similar period last year. The total operating expenses increased from $12,044,740 to $12,347,806 in 1926. Following the consideration of total income deductions, a net income remained of $2,811,337, against $2,514,803 for the five months period ended Nov. 30, 1925.

Big Business in South Bend. — An indication of the large volume of business done during the Christmas holidays in South Bend, Ind., is given in figures compiled by the Chicago, South Bend & Northern Indiana Railway. The Saturday before Christmas all records were broken, with a total of 71,267 passengers handled, the day being the largest in the history of the company. Passenger traffic on interurban lines into the city also was very heavy.

Reports Loss.—Franklin T. Miller, receiver, has produced his seventh report on the operations of the Boston & Worcester Street Railway, Framingham, Mass. The operating revenues exceeded operating expenses from July 1 to Sept. 30 by $6,400. Taxes and interest, however, exceeded this amount by nearly $1,500. The receiver's report from Feb. 11, 1925, to Sept. 30, 1926, the total of the period of receivership, shows a net loss of $49,969.

Rainier Purchase Planned.—A campaign for the purchase of the Seattle & Rainier Valley Railway lines by the city of Seattle, Wash., has been undertaken by residents living in the Rainier Valley, who have started the groundwork for plans by which they hope to center the attention of every voter on the railway purchase issue at the election next March. The Rainier Railway Purchase League has been formed to handle the campaign, with Charles Weedin chairman. A purchase of the railway already has been authorized by the City Council and a deal consummated whereby the valley line is to become a part of the local municipal system in the city of Seattle, payable in fourth lien utility revenue bonds. A referendum was invoked soon after the purchase ordinance was enacted, and the Council's action must go to the people at the city election next March for ratification or rejection. Meantime, the citizens of the valley interested in the matter declare, real estate values are being held back because persons going into the valley on street cars have to pay 10 cents when they desire a transfer. D. W. Henderson, superintendent of the Seattle Municipal Railway, declares that $200,000 additional revenue would accrue to the department if it operated the valley line. It is also pointed out that the tracks on Fourth Avenue, now used exclusively by the valley line, are greatly needed in the downtown traffic system of the municipal railway.

Deficit on Interborough. — For the five months ending Nov. 30, 1926, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was $24,322,310, a decrease of $331,219 over the corresponding period of 1925. Expenditures for operating and maintaining the property increased $761,630. Taxes payable to the city, state and the United States increased $119,657. Rentals and other income deductions increased $36,120. The net results for the five months was a deficit of $1,292,097. This is $1,248,627 greater than the deficit for the corresponding period in 1925. The comparison with 1925 is influenced by the strike during the month of July, 1926, as well as the fact that in July, 1925, there was a lump sum payment of $770,000 on account of the new advertising contract, against which there was no similar payment this year.

Chicago Will Intervene

City Plans to File Petition in Chicago Railways Receivership—Mayor Insists Public Interests Be Protected

Alarm over the possible repudiation of the contract which insures the city of Chicago 55 per cent of the net earnings of the Chicago Surface Lines as a result of the receivership of the Chicago Railways evoked an immediate order from Mayor William E. Dever to Corporation Counsel Francis Busch to take whatever steps in this crisis were deemed necessary to protect the public interests.

Mayor Dever later seemed impressed with the sincerity of the receivers' statement that they would not take any action which would interfere with the present Surface Lines operation or tend to disrupt the existing contracts between the city and the companies as to unified operation, universal fares, paving and street cleaning obligations, etc.

City Attorney Busch subsequently announced his intention of filing before Jan. 1 an intervening petition with Federal Judge James C. Wilkerson, who appointed the three receivers, advising the court of the interests of the city in these features of the expiring franchises so that in event of proceedings relating to the receivership being started the city may be given a chance to present its side. Mr. Busch said:

> The order of the court directs the receivers to continue the Surface Lines' joint operating agreements, including a single fare over the entire system and universal transfers. Also it authorizes the receivers to seek instructions from the court in regard to negotiations with the other surface lines for continuance of a unified service after Feb. 1. But it says nothing about the contract rights of the city under the 1907 ordinances.

Picturing the situation as it will probably stand on Feb. 1, when the present franchises expire and the bonds fall due, Mr. Busch said:

> Of course the cars will be running, either with some agreement or without. The courses left open at the expiration of the 1907 ordinances 45 days from now are set up in the franchise as follows:
>
> 1. The city may buy the lines. But the city hasn't got the price.
>
> 2. The city can designate a purchaser to which the companies must sell the properties on the same terms upon which the city might purchase. This is, if such a sale is after Feb. 1. If before Feb. 1, 10 per cent is required to be added to the purchase price. The Lisman plan comes under this possible procedure.
>
> 3. The city can stop the running of the surface cars and decide to put on some other vehicle of transportation. The proposal of the Chicago Motor Coach Company to substitute buses for the trolley cars comes under this.
>
> 4. The city can grant a franchise to the companies, not exceeding twenty years. The proposed six months extension of the expiring contract ordinance comes under this. Or an ordinance could be passed subject to a referendum of the people of Chicago, subject to subsequent legislation modifying the twenty-year limitation.
>
> If Feb. 1 comes without a six months extension the city could pass an ordinance allowing the cars to run from day to day subject to cancellation, or it could do nothing at all but let the cars run on suffrance. So far as concerns the west and north side lines under receivership, it would be up to the court to determine whether the city's rights, such as the 55 per cent of the income, the paving of the street car lines, and the street cleaning, should continue, while with the other companies it would be a matter of voluntary contract.
>
> Then the question of acquired rights might enter. In cases in other states, it has always been claimed that by letting them run some rights are acquired by the companies. So it is far better to have a definite stipulation such as a six months extension of the present franchises would give. We hold no rights are acquired in any event.

Chairman Joseph B. McDonough of the local transportation committee pretended to see in the receivership "just another crack at home rule." He said that "the north side lines want to gum things up and deal with the State Legislature instead of with the City Council."

In the opinion of Alderman Jacob M. Arvey, administration leader in the City Council, the receivership of the Chicago Railways has reacted in favor of the plan of the F. J. Lisman interests of New York for the settlement of the traction problem. This plan, in the form of a tentative ordinance, is now before the local transportation committee.

Wage Increase Alone Outstrips Increased Fare Earnings

Increases in rates of fare between 1915 and 1925 from 5 cents to 7 cents, and in some cases even 8 cents or 10 cents, and an increase of 3 per cent in revenue passengers carried during that ten-year period were not sufficient by $268,000 to permit the sixteen electric railways in Missouri to meet increases in wages alone for the same period, although operating expenses, other than wages and taxes, were reduced $2,179,063 in 1925 under 1915, according to a statement made by the Missouri Committee on Public Information.

Item	Year 1915	Year 1925	Increase 1925 Over 1915	Per Cent Increase
Total operating revenue	$21,631,634	$30,565,527	$8,933,893	41.2
Total operating expenses	14,483,464	22,479,257	7,995,793	56.1
Net operating revenue	7,148,170	8,086,270	938,100	13.1
Total wages paid	7,022,809	16,224,408	9,201,599	131.0
Total taxes paid	1,464,633	2,437,790	973,157	86.5
Other operating expenses	5,996,022	3,816,959	(2,179,063)*	36.3*
Average number of employees	9,339	10,035	696	7.5
Average annual wage	752	1,617	865	114.0
Wages to total expenses, per cent	48.6	72.5	23.9	49.2
Taxes to total expenses, per cent	10.1	10.8	0.7	6.9
Total fixed capital investment	188,260,986	183,417,494	(4,843,492)*	2.6*
Net revenue in per cent fixed capital	3.8	4.25	0.45	11.8

* Decrease.

The survey covered all sixteen electric railways in the state. The data contained in it were taken from reports made by the companies to the Public Service Commission.

Comparisons brought out in the summarized figures for the two years are contained in the accompanying table.

"Due to the increased cost of living the increase of wages paid were, no doubt, fully warranted," the committee states, "but it is apparent that the fare charges did not permit, in 1925, a proper return over and above increased wages and taxes, even though the economies and improvements effected in all other operating costs, and in the service generally, produced a reduction in operating expenses of $2,179,063, or 36 per cent during this ten-year period."

The increase in total revenue of $8,934,000 was insufficient by $268,000 to meet the increase of wages alone of $9,202,000 during that period, while increases in taxes added a further deficit of $973,000 during the same period.

Diminishing Traffic Forces Indiana Line to Cut Service

The Hammond, Whiting & East Chicago Railway, which operates approximately 33 miles of track in the city of Chicago and adjoining communities in Lake County, Ind., has announced its intention to reduce service on the line between Hammond and East Chicago, Ind. This line has been making a valiant fight against jitney and motor coach competition for several years, but riding has become so light the company is compelled either to alter the service or suspend operations altogether. The present ten-minute service during morning and evening rush hours will be maintained, but during the rest of the day the present twenty-minute service will be cut to a car every hour.

According to Charles E. Lawrence, general manager of the road, riding fell off sharply five years ago when the streets of Hammond were swarming with jitneys and for a time the company could not make expenses. Conditions improved slightly after jitneys were ruled from the streets and an orderly motor coach service was installed, but by no means approached the old pre-jitney status. Most of the day's business is done during the morning and evening shifts at local industries, with a slight pick-up around noon.

Mr. Lawrence believes that by cutting down off-peak service the company can minimize costs without any appreciable decrease in gross business.

Hearing on Abandonment Concluded

Hearing upon that part of the petition of the Hudson Valley Railway for permission to abandon the Lake George-Warrensburg part of its road was closed before the Public Service Commission recently and James McPhillips of Glens Falls, representing the company, and James E. Kiley, also of Glens Falls, representing the town of Warrensburg, were given three weeks in which to file briefs. Evidence by officials of the electric railways was to the effect that the Delaware & Hudson Company's last dividend was 9 per cent; that the controlling interest in the Hudson Valley Railway was held by the United Traction Company, and that controlling interest in the latter was held by the Delaware & Hudson Company. J. King Gillingham, an employee of the electric railway, said that with slight replacements the track of the railway would be in fairly good condition. Final hearing was also held on the company's petition for abandonment of that portion of its line between Thompson and Greenwich.

Legal Notes

ALABAMA.—*Ejection of Passenger After Time Limit on Transfer Ticket Has Expired.*

A passenger who attempted to ride on a transfer ticket whose time limit had expired was ejected, without unnecessary violence, by the conductor. He claimed that he had been unable to secure passage upon any car passing the given point within the life of the transfer. It was held that this failure did not entitle him to ride on an expired transfer and he could not sue for wrongful eviction. His remedy was to sue for the negligence of the company in issuing an improper transfer or in failing to furnish cars on which the transfer might have been used within its time limit. [Birmingham Electric Co. vs. Putnam, 109 Southern Rep., 890.]

ILLINOIS.—*Application for Relocation of Railroad Should Prove Convenience and Necessity for Road Actually Giving Service.*

The North Shore Connecting Railroad was organized by the Chicago, North Shore & Milwaukee Railroad to unite two existing sections of its line by a cut-off which would eliminate the necessity of the latter road operating over certain city streets in Evanston. Its petition for right to build this line was granted by the Illinois Commerce Commission, but the action of the commission was reversed by the Illinois Supreme Court on the ground that the North Shore Connecting Railroad itself was not authorized to serve the public by operating trains and that it could not remove the tracks now on the city streets in Evanston. The proper method for securing the change would be for the operating railroad in its own name to petition the Commission for relocation and to prove that the relocation would serve the public interest. [Roy et al., vs. Illinois Commerce Commission, 153 Northeast. Rep., 648.]

MONTANA. — *Legal Speed of Cars Changed by Ordinance.*

A city council passed an ordinance permitting trolley cars to operate at a higher speed than was originally allowed in the company's franchise. After an accident, the plaintiff charged that the trolley car was running at a higher speed than was permitted in the franchise, but as this speed was not greater than that allowed by the ordinance, the latter was held to be controlling and the company was not responsible. [Varn vs. Butte Electric Railway, 249 Pacific Rep., 1070.]

OHIO.—*Low Revenue of Traction Company Should Be Considered in Grant of Parallel Route.*

The East End Traction Company protested against the grant of a motor bus franchise in the territory served by it, and proved that it had made no net revenue over operating expenses and taxes for the previous five years. The Public Utilities Commission should have given some consideration to this fact, in so far as the depletion of the company's revenue might necessitate a further abandonment of the traction line altogether. Hence, the grant of the motor bus franchise by the commission was reversed. [East End Traction Co. vs. Public Utilities Commission, 152 Northeast. Rep., 20.]

NEW JERSEY.—*Collision of Automobile with Pillar of Elevated Railway.*

A person driving an automobile at night collided with the pillar of an elevated railway structure, and brought suit against the company on the ground that the pillar was a nuisance and should be illuminated at night. The Court decided that as the elevated road was built pursuant to authority, it was not a nuisance and the public must take note of the presence of the pillar in the street, and in the absence of any requirement by statute or ordinance requiring illumination, the railroad was not obliged to illuminate them. [Lorentz vs. Public Service Railway, 134 Atlantic Rep., 818.]

NEW YORK.—*Bus Franchises Upheld.*

An injunction restraining the city of Yonkers from awarding certain franchises or consent for the operation of motor bus routes was denied in spite of various objections raised by the Yonkers Railway Company, including the following: That the Board of Estimate should approve the grant, that all bidders were asked to waive objections to the reasonableness or legality of any provisions of the contract, that at the expiration of the franchise there could be renewal for ten years under certain conditions, that the city may take over the franchises for municipal operation, that certain clauses provide for summary forfeiture of the franchise without recourse to proceedings at law or equity and that approval must be received from the Public Service Commission. [Yonkers Railways vs. City of Yonkers, 217 N. Y. Supp., 686.]

OREGON. — *Power of Public Service Commission over Carriers.*

In 1921 the state passed an act regulating motor vehicles operated for compensation over public highways, defining what constitutes transportation, compensation and transportation companies. A section of the act forbids any concern, as defined in the act, to operate any motor vehicle for transportation of person or property, for compensation, on any public highway of the state, without first having obtained a permit from the Public Service Commission but authorizes the commission to exempt from the operation of the act the transportation of freight or passengers by motor vehicles in rural communitites if not done on a commercial basis. The court held that on the basis of a reasonable classification in the exercise of the police power, the legislature may regulate the use of highways and may even forbid the use of them for some purposes, but in the present act there is nothing in the statute relating to the use of the highways. The commission is given arbitrary power to apply the act when and where it will be governed only by its own discretion. Hence, the commission was enjoined against interfering with the business of the defendants. [Purple Truck Garage Co. et al., vs. Public Service Commission. 250 Pacific Rep., 213.]

PENNSYLVANIA. — *Municipal Railway Property Taxable.*

The city of Philadelphia built an elevated railway on Frankford Avenue and a surface line to Bustleton and leased them to the Philadelphia Rapid Transit Company for five years at a fixed rental. A tax assessment in favor of the Commonwealth against the Philadelphia Rapid Transit Company for these properties was upheld on the ground that the property of a municipality used for purely private purposes is not exempted from tax, although that used for governmental purposes is not taxable. [Commonwealth vs. Philadelphia R. T. Co., 134 Atlantic Rep., 452.]

RHODE ISLAND.—*Right-of-Way at Street Intersections.*

The driver of a carriage or automobile, proceeding at a reasonable speed, who reaches a street intersection in time to go safely across the tracks in advance of an approaching car, has the right-of-way. Hence, a railway company was held responsible when its trolley car ran into an automobile which became stalled on the track while trying to cross when the electric car was about 100 feet away. [Hassam vs. United Electric Railways, 135 Atlantic Rep., 36.]

TEXAS.—*Duties of Street Railway to Keep Boarding Places for Cars in Good Condition.*

The charge by the trial court, that it is the duty of a common carrier to maintain a boarding place or platform "in a reasonably safe condition and repair," places upon it greater responsibility than the law requires. For all accidents occurring at a boarding or alighting place outside of the area which the railway company was required by law to keep in repair, it was not responsible. [Eastern Texas Elec. Co. vs. Tucker. 287 Southwest Rep., 71.]

WASHINGTON.—*Test of a "Public Carrier."*

The state sought to recover penalties because the defendants (a tug and barge company) did not charge for services rendered by it in accordance with the tariff on file with the Department of Public Works. It claimed to be a private carrier and, therefore, not bound by the tariff rates. The court held that a common carrier is one whose occupation is the transportation of persons or things from place to place for hire or reward and is willing to serve the public indiscriminately in the lines or departments in which he is engaged. The fact that a company has no fixed schedule of rates and reserves the right to refuse to give service whether its vehicle is engaged or not, is immaterial; its character is determined by its public profession. [State vs. Washington Tug & Barge Co., 250 Pacific Rep., 49.]

Personal Items

Lionel J. Bourke Promoted in Seattle

Lionel J. Bourke, secretary to William H. McGrath, vice-president of the Puget Sound Power & Light Company, Seattle, Wash., has just been appointed assistant to the vice-president. In the same year that he was graduated from the Texas Agricultural & Mechanical College, namely, in July, 1922, he entered the employ of the Stone & Webster Company, Boston, Mass. The following March he joined the Puget Sound Power & Light Company as a student engineer and was appointed resident manager at Elma, Wash. He was appointed secretary to Mr. McGrath in the executive offices in Seattle on Dec. 1, 1924.

L. J. Bourke

Mr. Bourke, the new assistant, was born at Yoakum, Tex., Feb. 19, 1900. At the Texas Agricultural and Mechanical College he took a B.S. degree in electrical engineering.

Personnel Changes in New York Companies

Further changes are announced in the personnel of the New York Railways and the Fifth Avenue Coach Company, New York, N. Y., the operating organizations of which are now more closely affiliated. Appointments made by the New York Railways effective Jan. 1, 1927, are as follows:

Henry J. Smith is made general attorney, reporting to the president, vice R. B. Hull, resigned.

F. B. Gordon, in addition to his present duties as secretary of the corporation, will take over the duties of treasurer, reporting to the president, vice J. S. Dunham, treasurer, transferred to the law department.

T. G. Walker is appointed assistant secretary and assistant treasurer.

Joseph A. Clair is appointed claim agent, reporting to the general attorney.

C. A. Wittcke is appointed assistant purchasing agent, reporting to the vice-president.

Changes made by the Fifth Avenue Coach Company effective Jan. 1, 1927, are as follows:

Henry D. Cruger has submitted his resignation as auditor. He will be retained in a consulting capacity.

George V. Owen is appointed auditor, reporting to the president.

Worthington G. Strait is appointed purchasing agent, reporting to the vice-president and general manager.

C. A. Wittcke is appointed assistant purchasing agent, reporting to the purchasing agent.

Mention was made in the ELECTRIC RAILWAY JOURNAL for Dec. 25, 1926, of the election of officers of the Fifth Avenue Coach Company to the board of directors of the New York Railways.

James Dalrymple—Tramway Internationalist

The Scotsman Who Held True to the Trust Reposed in Him—To Act as Consultant

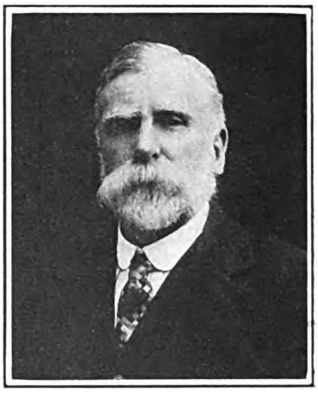
James Dalrymple retires as of Jan. 1. Those who have known only the achievements of Mr. Dalrymple as tramways manager must have often wondered why an operator of world-wide reputation remained in Glasgow for 46 years when much more tempting positions had been open to him for a generation, but those who know James Dalrymple the man realize that loyalty to an ideal meant far more to him than money.

That ideal was, first, to give Glasgow a transport system that would stand forth to the world as the best of its kind and then to retain that reputation for the city. It was not until changing political conditions threatened to make continuance of this ideal impossible that James Dalrymple resigned.

Even those who follow British politics only slightly must be aware of the new alignments that are taking place. Since the rise of the Labor party, the old principles in municipal operation of utilities seem to be going by the board. With the middle-class parties in power, municipal tramways frankly were run on business principles in the expectation that their profits would go toward the reduction of taxes. With the Labor party in power, the tendency is toward making the service so cheap for the user that, if necessary, taxes are raised instead of lowered. The workingman sees only the direct personal charge of the fare, and does not see the inevitable but indirect charge of an inadequate fare reflected in higher rent and other living costs due to higher taxation.

To practical, conscientious men of the Dalrymple type, this change of attitude on the part of the councils to whom they report is most disturbing. They do not want to retain their jobs at the sacrifice of principle. In Mr. Dalrymple's case, the matter of fares was not the immediate issue, although that question was always in the background. It was a matter of asking him to break his word that strikers who failed to return by a given day would not be restored to their positions at the expense of those who replaced them. When Mr. Dalrymple stood upon his disciplinary powers as manager with an "M," the Council indorsed his opposition to the tramways committee and asked him to withdraw his resignation. This he declined to do, offering his resignation as of Dec. 31, 1926, with no prejudice to his well-earned rights for superannuation pay.

But James Dalrymple is far from superannuated. His keen Scotch brain is brighter than ever. Even in earlier days, when it was no easy task to borrow him from Glasgow, his services as a consultant were sought far and wide. Perhaps his most famous consultation was that for Mayor Dunne of Chicago in 1905. When the Chicago Mayor refused to make public the outcome of Mr. Dalrymple's widely heralded study, on the plea that it was a private report, the Glasgow Council properly insisted that Mr. Dalrymple had been loaned only as a courtesy to the people of Chicago and not to an individual. The people were entitled to know Mr. Dalrymple's conclusions. Whereupon the whole report was printed as a portion of the Council's minutes.



James Dalrymple

This report contained a letter, dated June 29, 1905, from Mr. Dalrymple to Mayor Dunne, in which occurred the bluntly honest passage that had been found so distasteful, viz.

> There would undoubtedly be a very grave danger in your city attempting to operate what would be the largest street railway undertaking in the world without making a very radical change in the methods usually employed in carrying on municipal work by the cities of the United States.

Tableau!

In all likelihood, Mr. Dalrymple will continue his globe-encircling consultations on a larger scale than has been practicable heretofore. Within the last two years he went to Bombay, India, and now São Paulo, Brazil, has put in a call for him. Glasgow has lost James Dalrymple through class politics, but the transport world at large has won him for still greater triumphs.

Changes in Day & Zimmermann

Well-Known Firm Honors Three Employees Who Have Risen from the Ranks—Distinction for Two Executives

A recent move by Day & Zimmermann, Inc., an engineering and management corporation, has resulted in the promotion of five employees, two of whom are executives and the three others promoted from the ranks. Charles Day, president, becomes chairman of the board of directors; John E. Zimmermann, vice-president, becomes president. Three long-term employees assume the duties of vice-president; they are Floyd W. Woodcock, in charge of public utility management; Col. E. M. Chance, in charge of the engineering and construction work, and W. Finlay Downs, who is in charge of engineering reports and valuations of utilities and industrials. All three were placed on the board about two years ago. These changes are noteworthy in that this firm has not only managed and operated many utility properties, including railways, for its own account but also has participated in the management and reorganization of properties for others.

Charles Day, the new chairman of the board, is one of the country's foremost engineers and business advisers. His early career included participation in the introduction of scientific management with the Link Belt Company. Under the firm name of Dodge & Day he then offered to industry, as a consultant, the experience that he had acquired. He specialized in the introduction of mechanical equipment. This led him to engage in the planning and construction of industrial plants, then the construction of electric properties, railways and transmission lines. Mr. Dodge withdrew in 1911 and the firm became Day & Zimmermann. In rapid sequence the firm's activities were extended to embrace the management of public utilities and industries and the scope of its investigation and report work was broadened to embrace not only the mechanical and operating problems, but those concerned with financial matters as well.

MANY ACTIVITIES DURING THE WAR

His services during the war were readily accepted by the government and he became affiliated with the general munitions board and of the depot board of the War Department; he served on an observation committee and on the shipping board. He visited all ports, storage and terminal facilities and lines of communication reached by American forces and reported on the adequacy of these facilities. He lectured for many years in special courses at the Graduate School of Business Administration in Harvard University and Columbia and Lehigh on the planning and building of industrial plants. His interest in his alma mater led him to accept the trusteeship of the University of Pennsylvania and he has been actively engaged on various phases of the work of that busy board. In addition he has served as director and officer in many of the public utilities managed by his company and on the boards of the Interborough Rapid Transit Company of New York, Pennsylvania Railroad and the Fidelity-Philadelphia Trust Company.

His associate, John Edward Zimmermann, was for a time surveyor on the Pacific Railroad and superintendent in the Great Southern Railroad shops in the Argentine Republic. In 1907 he became a member of the engineering organization now known as Day & Zimmermann, Inc., Philadelphia, of which he became vice-president. He has participated actively in the construction work of the company, but his most valuable contribution to the firm's success and the one for which he is best known in the business world is his contribution to public utility management. This branch of the company's activities was under his direct supervision. It now embraces, among other projects, the electric light and power, bus, electric railway and refrigeration properties in eight states, serving more than 100 communities and many of the most prominent industries of the Eastern states. Under his guidance these facilities have been developed physically and economically and extended to meet changing conditions. Mr. Zimmermann is a member of the American Society of Mechanical Engineers, American Institute of Electrical Engineers, Franklin Institute, Pennsylvania Historical Society, Pennsylvania Museum and School of Industrial Arts.

F. W. WOODCOCK'S RAPID RISE

Floyd W. Woodcock is one of the new vice-presidents. He rose from messenger and general utility clerk in the home office in 1908 to manager of the public utility management department and right-hand man to Mr. Zimmermann in 1922. He has learned the business from the ground up. When the first management job went into the office Mr. Woodcock followed Mr. Zimmermann's work and methods. When Mr. Day began to apply the principles of scientific management to public utilities he gave close attention to that, too. He firmly made up his mind what he wanted to do and prepared for it by studying electrical engineering at Drexel Institute at night. Afterward, when a definite, responsible assignment was intrusted to him, he installed the company's system of classification and of records and store keeping and planning on the Penn Central property and later extended it to others.

In this way he became a sort of general "trouble" man and was shifted from one place to another to combat disagreeable and difficult jobs. All through these years he kept on with his engineering studies, getting the practical application of the principles in his daily contact with construction and operation in the field. Then the Eastern Shore properties needed a general superintendent and he was given the chance to put into practice all the experience he had obtained. He studied the personnel available for a successor to himself. Thus it was that when Mr. Zimmermann decided that for his own relief and the good of the service he would bring Mr. Woodcock from the home office another was ready to step into his position.

Col. Edwin M. Chance, another of the new vice-presidents, was a chemist and engineer with the Reading Coal & Iron Company and consulting engineer for a group of coal mining industries before the war. In 1917 he was commissioned captain by the Ordnance Department, charged with the responsibility of filling shells with poison gas. He designed and built the plant at Gun Powder Neck in Maryland known as the Edgewood Arsenal. The total cost of the plant was about $38,000,000. Over this plant he had complete charge. The Edgewood Arsenal supplied not only the gas for filling American shells, but shipped great quantities of bulk gas to France and Great Britain to supplement their production. Colonel Chance was in charge of all design and construction work and later was in charge of operations.

W. FINDLAY DOWNS CONSPICUOUS IN VALUATION WORK

W. Findlay Downs, the third newly appointed vice-president, started his career doing forestry service in the Maine woods. Later he became affiliated with the United Construction Improvement Company, Philadelphia, as an engineer. His activities include service with J. G. White Engineering Corporation, assistant engineer of the Pennsylvania Public Service Commission and valuation work with the New York Telephone Company. With Day & Zimmermann he was engaged in valuation of utilities and industrials.

F. C. Lynch Heads Kansas City Safety Council

F. C. Lynch, superintendent of bus maintenance of the Kansas City Public Service Company, Kansas City, Mo., has been elected director of the Kansas City Safety Council by the executive committee of that organization, succeeding Julien Harvey, former director, who resigned to become affiliated with the National Safety Council in Chicago.

Mr. Lynch, better known to his friends and associates as "Mike," entered the service of the Kansas City Railways, predecessor of the Kansas City Public Service Company, on Sept. 20, 1922. His duties with the Kansas City Railways brought him in close touch with safety matters and he has been prominent in the activities of the Kansas City Safety Council.

Obituary

E. M. Walker

Edwin M. Walker, president of the Schenectady Railway, Schenectady, N. Y., died very suddenly on the morning of Dec. 30 of a heart attack suffered as he was attending to his automobile in his own garage.

Mr. Walker had been at Schenectady as president since September, 1923. Before that he had, since 1917, been general manager of the Terre Haute division of the Terre Haute, Indianapolis & Eastern Traction Company. He was born at Workshop, England, in 1875, but was educated in the United States.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Extensive Equipment Exhibit for American Road Builders

Final arrangements have been completed for the annual convention and road show of the American Road Builders' Association, which is to be held in the coliseum at Chicago, Jan. 10 to 14, 1927.

Already more than 300 carloads of machinery and materials have been arranged for display. More manufacturers have applied for space this year than ever before, which necessitated extra space being acquired in the Wilson Building, adjacent to the coliseum. The exhibit of the United States Bureau of Public Roads will depict all conditions in the road field and finally finish with an exhibit by a mythical Highway Commission of Utopia.

As the convention is coincident with Good Roads Week, officials of the association have made elaborate plans for speakers. They have also invited the Governors of all the states in the Union to appear. Former state executives who were especially active in sponsoring a highway program have been invited, as have leading road promoters from foreign countries.

General Electric Reviews Activities During 1926

Scheduled for distribution Jan. 1, the General Electric Company announces that the annual review of its activities in the electric railway field has been prepared by W. B. Bearce of the railway engineering department.

An advance copy reveals that Mr. Bearce, in addition to making a comprehensive résumé of the developments in the railway field, has reviewed at some length the progress of and results obtained from railroad electrification, giving generous space to the work undertaken by the Anglo-Chilean Consolidated Nitrate Corporation, Tocopilla, Chile; the Great Northern, Illinois Central, New York Central, New York, New Haven & Hartford and Pennsylvania systems.

Under this subject are included some figures which were the result of a study made by the Spanish Northern Railway with respect to the merits of steam and electric locomotives on the Pajaras grade, where the larger portion of the tonnage is hauled in an up-grade direction.

Incidentally these figures show a 55 per cent saving in the cost of electric power as compared to coal, a reduction of 47 per cent in the number of engine-miles for the same traffic handled, 73½ per cent saving in the cost of repairs and upkeep for locomotives, a saving of 63 per cent in crew expense and a reduction of 31 per cent in the cost of moving a ton-kilometer of freight.

The author also gives some interesting sidelights on oil and gas-electric motive power, railway substations and mercury arc power rectifiers.

Coincident with the appearance of this review the company has released a 38-section article by John Liston on "Some Developments in the Electric Industry During 1926," several sections of which are devoted to pertinent subjects in the electric railway field. Numerous illustrations add interest to both releases.

Westinghouse Achievements Outlined in Year Book

Engineering achievements of the Westinghouse Electric & Manufacturing Company for the past year are attractively set forth in a 42-page booklet by H. W. Cope, assistant director of engineering. The publication, which covers a wide range of subjects, is expected from the press in about three weeks.

In the opinion of the author, the outstanding contribution of his company to the light traction field was the dual ventilation for railway motors, a problem that was only solved after lengthy and extensive tests which definitely determined that dust and sand carried by the ventilating air in previous models was the sole cause of excessive brush and commutator wear.

To obviate this trouble, there has been perfected a dual ventilating system which retains all of the advantages of the ventilated type and in addition practically secures the brush and commutator life of the non-ventilated motor. As a result, where sand conditions are serious, brush and commutator life has been more than quadrupled.

In the new design the armature and fields are separately ventilated and the ventilating air for each is kept out of the commutator space by means of baffles. The exclusion of the air from the commutator space keeps out the dust.

Other subjects discussed of interest to the field are: Gas-electric equipment, buses, current collection, railroad electrification, circuit breaker tests, railway motor test dynamometers, electric welding, controls, etc.

Mr. Cope also gives a very interesting description of the system for ventilating the Holland vehicular tunnels under the Hudson River.

Metal, Coal and Material Prices

Metals—New York	Dec. 28, 1926
Copper, electrolytic, cents per lb.	13.20
Copper wire, cents per lb.	15.50
Lead, cents per lb.	7.80
Zinc, cents per lb.	7.35
Tin, Straits, cents per lb.	66.25
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.275
Somerset mine run, Boston, net tons	2.75
Pittsburgh mine run, Pittsburgh, net tons	2.125
Franklin, Ill., screenings, Chicago, net tons	1.75
Central, Ill., screenings, Chicago, net tons	1.375
Kansas screenings, Kansas City, net tons	2.325
Materials	
Rubber-covered wire, N. Y., No. 14 per 1,000 ft.	$6.00
Weatherproof wire base, N.Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.88

Large Orders for Buses Soon to Be Placed in New York

Some idea as to the extent of the orders for buses and equipment incident to the pending franchises now before the Board of Estimate and the Mayor of New York city may be gained from the fact that the Equitable Coach Company may operate 352 buses in Manhattan, 224 in Brooklyn and 196 in Queens, for which purpose it expects to invest about $20,000,000 in equipment.

In addition to this it is reported that the Surface Transportation Company, which may operate 81 buses in the Bronx, contemplates an investment of $1,500,000. Should the Manhattan Surface Coach Company succeed in wresting from the Equitable company the franchise rights for the Borough of Manhattan its bus requirements will exceed 300 units.

It is understood that the buses for the Equitable company are to be built by the American Car & Foundry Company or its subsidiaries. The Equitable Coach Company is sponsored by J. G. White & Company, Inc., New York; the Surface Transportation Company by the Third Avenue Railway, and the Manhattan Surface Coach Company, Inc., by the New York Railways.

Incidentally, the proposed awards have met with strong opposition from subway officials.

General Electric Names Three New Commercial Vice-Presidents

Three district managers of the General Electric Company were elected commercial vice-presidents at a meeting of the board of directors in New York on Dec. 30. The men thus signally honored were Theodore Beran of the New York district, J. A. Cranston of the Pacific Coast district and H. L. Monroe of the Chicago district.

The newly elected vice-presidents will continue their supervision of the commercial activities of the company in their respective districts.

Track and Line

Memphis Street Railway, Memphis, Tenn., will likely extend its Jackson Avenue line from Watkins Street to University Place by 1928, if plans promulgated by the city are carried out. Active efforts to that end have been promised by Mayor Rowlett Paine and Commissioner Horace Johnson with a committee representing the property owners along the 2-mile route.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, January 8, 1927 *Number* 2

Design of Standard Freight Car Stimulated Sales

INTERURBAN electric railways are going after freight business with new freight cars. This fact was emphasized by the rolling stock statistics published in the Jan. 1, 1927, issue, which show 198 freight cars ordered during 1926. Of these 147 were ordered by Ohio roads. Nearly all of these cars are the standard design brought out by the Central Electric Railway Master Mechanics' Association in December, 1925. When the group of electric railway equipment men in the Central States got together and agreed on a standard freight trailer, nine companies indicated that their aggregate requirements would be about 150 units. The 1926 statistics show that 13 roads in this district ordered 186 cars. Railways in the Central States were in need of additional freight equipment and by bringing out a standard design sales were stimulated. This certainly is a feather in the cap of standardization, and while passenger cars cannot be standardized so readily, as has been demonstrated already, still the work of passenger car standardization may well be carried much further and many items of equipment standardized with excellent results.

Last Year's Receivership Record the Most Encouraging in Years

MOST encouraging is the record of receiverships in the electric railway industry for the year just completed. As an index of the progress which is being made, it shows clearly the gradual but steady growth of financial stability. The record published in this paper last week shows a material reduction in the number of railways which have been overcome with difficulties and an increase in the number of roads which have been successful in overcoming them.

At the beginning of the year only a few major properties remain under the protection of the courts, and these are rapidly clearing up their difficulties so that it is likely that several of them will emerge from receivership before the end of 1927. Apart from the Chicago Railways, which was thrown into voluntary receivership as a protective measure on account of the political situation, only two roads with 100 miles or more of track went into receivership during 1926. These are the Olean, Bradford & Salamanca Railway and the Utah-Idaho Central Railroad, the latter road having also emerged from receivership in 1926. Both of these are interurbans, as are all but a few of the other defaulting companies. The largest company to come out of receivership and one of the few of its kind still under federal protection was the Kansas City Railways.

True, some companies that never have been in receivership and appear to need the advice most have not made the determined effort that seemed desirable toward carrying out the recommendations for changes in capital structure made by the committee on finance a year ago last October. In brief, these were for voluntary reorganization in such a way as to reduce fixed charges. These companies cannot hope to escape the onus that attaches to this unwillingness on their part in the event that they come into the market for funds. In fact, it would appear that only in this way are some of them likely to undergo changes that certainly appear to be most desirable.

Manufacturers Are Optimistic for the Coming Year

MANUFACTURERS who rely wholly or in part upon the transportation industry for their market are adopting an optimistic attitude toward the twelve months just ahead, based on the theory of continued prosperity. Many of them feel, and with justice, that the railways are slow in sensing the new order of things; leaning over backward to avoid any hint of too impulsive modernization activity and thus defeating temporarily their own best interests. Yet the equipment men call attention to the increasing momentum of the modernization campaign and look to the immediate future for a widespread acceptance by the public of the indispensability of electric railways.

Some of those who pin their faith on the theory of invariable business cycles are inclined to be skeptical concerning the ability of American industry to prevent the periodic recurrence of serious business depressions. They have overlooked, however, the various checks which have been set up by industry to forestall any such declines. So-called hand-to-mouth buying is coming more and more into general practice, not only by transportation companies but by all classes of business; manufacturers are in much closer touch with their particular markets than formerly and they are now able to control production to suit demand; prices have been maintained at very stable levels, if anything declining slightly in the face of heavy purchasing requirements, thus indicating that production costs are being pared to a satisfactory minimum; foreign markets are being consistently developed by American industry and may prove a valuable stop-gap in the event of a temporary slowing down of consumption here.

Hence it seems reasonable to assume that the electric railway industry, in common with other fields of business, may plan ahead for expenditures needed in equipment replacements and service improvements, having confidence that in the coming year ample revenues will be forthcoming.

Equipment manufacturers are convinced, for the most part, that 1927 will be marked by greatly increased purchasing by the electric railways and are preparing for a degree of production undreamed of during the lean period of the past few years. The railways have been slow to react to the national prosperity, yet one is reminded of the proverb: "All things come to him who waits."

Stabilization of the Industry Should Stimulate Purchases

STABILITY of electric railway costs was a matter of comment a year ago. The study of fares, operating and construction costs and wages, conducted by Prof. Albert S. Richey, then indicated a remarkable degree of stabilization. This year a similar study by Professor Richey, published last week, indicates that the fluctuations have become even less marked than before.

The charts in his article show remarkable freedom from violent changes in the various index numbers considered. Fares, for instance, had a maximum range between 151.2 and 153.2, or 1.3 per cent. While this is slightly more of a change than the 0.9 per cent variation in 1925, it indicates the remarkable degree of stabilization that has been reached. On the expense side, electric railway operating materials showed a fluctuation between 153.1 and 159.2, or 4 per cent, as compared with 5.7 per cent the year before. Wages have advanced from 223.8 to 226.8 or 2.1 per cent, against 0.9 per cent in 1925. Electric railway construction costs moved between 201.3 and 203.7, or 1.2 per cent, a reduction from the 2.6 per cent of the previous year. As in the earlier year, wholesale prices of all commodities went down, receding from 156.0 to 148.1, or 5.3 per cent, as against 3.6 per cent in 1925 and 7.9 per cent in 1924. The average of these fluctuations for the past year is only about half of the average of a year ago.

Last year's prediction of stabilized costs is thus borne out. All information available points to a further continuation of stability throughout the present year. There is thus every reason why the industry may go forward with confidence and plan for the future on the basis of known conditions. In particular this applies to contemplated purchases. There is every reason for not putting off improvements involving labor or materials because of a possible recession in prices. There is every reason why the alert railway management should go ahead with the knowledge that changes in the prices will be minor, and that there even may be a saving in cost through buying now, as well as getting the advantage of using improved facilities.

Will the Railways Rebuild or Renew Their Cars?

WHILE the JOURNAL'S forecast based on data received from many companies points to an expenditure of $55,000,000 for equipment in 1927, a close study of the individual returns discloses the interesting point that not all this money will go for new cars. Much of the budget is for capital expenditures on old cars. The 1926 figures of actual accomplishments also bear out this conclusion, because that is exactly what many of the roads did do. How far this tendency will go in the future depends on the appeal of the modern car designs of 1927.

In many cases no brief can be held against this practice of rehabilitation, even though gross mistakes have been made in the past by expenditures on old equipment unwarranted from the standpoint of value received. Often such a policy is forced by financial conditions as the lesser of two evils. Many managers are thoroughly convinced of the advantage of new as against rebuilt equipment, but are unable to convince their financial backers. The public, too, may not be as thoroughly convinced as might be desired. The points of superiority in the latest type cars have not impressed themselves on the manager so that he can produce an argument strong enough to do a complete selling job to his bankers and often to his public.

Here lies the crux of the new car situation in the industry. As long as the conventional designs of twenty years ago form the background of modern design, bankers as well as patrons, who are once removed from actual contact with the details of operation, may not be convinced readily of the superiority of new over old or rebuilt cars.

What is needed is the grip of some master hand. In the emergency of the late war a group of engineers went into a prolonged conference on airplane motor design and after a period of intensive work emerged with the Liberty engine. Perhaps the same treatment is in order again for the street car. The demands for noise reduction, higher speeds and greater comfort are so intense that fundamental changes may be necessary from the type of construction now so generally adopted. Public favor extended to buses is largely because of their newness and improved seat comfort and reduction of noise.

The extent to which the industry will be persuaded in the future to devote its capital budget to new cars as against rebuilding old ones will be in no small measure determined by the sales appeal of the product offered in the immediate future. The improvements of the bus must be capitalized and added to others possible in rail car construction.

Terminable Permit Law Recommended by Illinois Committee

STRICTLY in line with the bulk of modern thought on franchise matters is the recommendation of the sub-committee of the Illinois terminable permit commission that the terminable permit is superior to the definite term franchise. It does not see in that form of grant any reason to doubt the ability of the cities adequately to protect themselves, but it does see in that form of grant a stabilizer, particularly so far as the grant carries reasonable assurance of continuity of the enterprise to the investors who make the enterprise possible. In particular the committee was impressed with the soundness of the argument that grants of this type tend to take the utilities out of politics. As a result of its deliberations the committee recommends that appropriate legislation be adopted at this session of the General Assembly to remove the present limitation of twenty years as the maximum term for which franchises may be granted to street railways and authorizing the issuing of the terminable permit.

The suggestion is entirely reasonable that these permits be made only under such terms and conditions as may be deemed wise by the Assembly to insure continuous and efficient operation of the utilities and to protect the public as to service and rates and the rights of the utility to the streets. To this end the suggestions could be followed that are intended by the National

Association of Railroad and Utilities Commissioners to be included in the uniform terminable permit law now under consideration by the National Conference Commission on uniform state laws. That body, be it recalled, regards the principle of the indeterminate permit as economic and sound, and urges the legislatures of the various states which have not yet adopted the principle of the indeterminate permit to enact legislation recognizing and putting such principle into effect.

A previous attempt to make possible a terminable permit failed in the 1925 Legislature through opposition on the part of the city of Chicago and some down-state interests. Following this the legislative commission that has just reported was created to investigate the operation of the terminable permit in other states and its feasibility in Illinois. Legislative bodies are usually deliberate in their actions, so there appears little likelihood that a permit law of this kind will be passed before the expiration of the present Chicago Surface Lines franchises on Feb. 1, but there would seem to be little reason to doubt that the present unfortunate conditions that surround the surface railways in Chicago would have been avoided had the companies there been under some such form of grant.

Railway, Bus and Taxis Under One Head in Twin Cities

NO LITTLE interest should attach in electric railway circles to the announcement made elsewhere in this issue of the purchase of the leading Minneapolis cab company by the Twin City Rapid Transit Company. It is the second largest purchase of the kind reported in this industry. Both the governing principle of co-ordination behind the matter and the extent of the purchase are significant. So far as the former goes the railway in the Twin Cities is said now to control all the interurban passenger bus services and some suburban lines entering the city, a program in which the first move was made several years ago. As to its extent, the purchase just made includes about 500 cabs.

It is too early to say just what plans will eventually be worked out for tying all the services together, but one thing is sure, duplication of the organization and the facilities of the taxi companies has been a source of unnecessary traffic congestion. True, control of the taxicabs in the Twin Cities, together with the ownership of the railway and the bus lines, gives the parent company virtual control of public transportation service, but that service is under the control of the city and the state. Such an arrangement is anything but inimical to the best interests of the traveling public. In fact, under proper regulation and control it is just the reverse. Far too often it is difficult to make the so-called man in the street see that there is no advantage to him in the duplication of transit facilities, but such is a fact nevertheless.

President Lowry rightly believes that the proposed unification will best serve the public interest in that it will be possible to give more efficient and better service. He believes that, given time, the company can clearly demonstrate that the transaction is a sound and logical one. It most certainly is. But there will be need for the exercise of care in working out the details. The suspicion that one form of service may be advanced to the detriment of another—a bugaboo easily conjured in the public mind—should be carefully guarded against. Co-ordination of railway and bus in the Twin Cities has been effected with such celerity, however, that it may well be presupposed the articulation of still another form of transportation activity with those that already exist will be carried out no less wisely than have other similar moves. As stated before, it is a significant move this, one which managers everywhere may well ponder carefully, whether or not the situations that confront them would seem to make a similar move by them desirable.

Chicago's Survey of Street Traffic a Masterful Report

STREET traffic in Chicago has finally reached that uncomfortable degree of congestion where representative business men are demanding that something be done to correct the situation. To this end the Chicago Association of Commerce, representing the business interests of the city, has made an extensive study and definite recommendations tending to alleviate the serious conditions that exist today.

The report just published by the association was undertaken at the invitation of the City Council, although financed by the association. It has a convincing appeal because of the extensive studies made and the abundance of data collected under the direction of Dr. Miller McClintock, director of the Erskine bureau for street traffic research of Harvard University. The survey forms the basis of the article appearing in this issue of the JOURNAL.

The report keeps close to the subject of traffic on street surfaces. Apparently it was not written to prove any preconceived theories or to favor any one agency. It might almost be said that undue favor was shown the private car operator despite the convincing evidence of his uneconomic use of the public thoroughfares. The inadequacy of curb parking and the resulting congestion is shown, however, and parking in the Loop would be prohibited during the day in favor of the development of extensive "off-street" parking areas and garages.

Of special interest to the railway industry is the story gleaned from many sections of the report of the efficiency of the street car as a transportation agent. The bus, too, makes an efficient showing, but so far has not been developed extensively in Chicago.

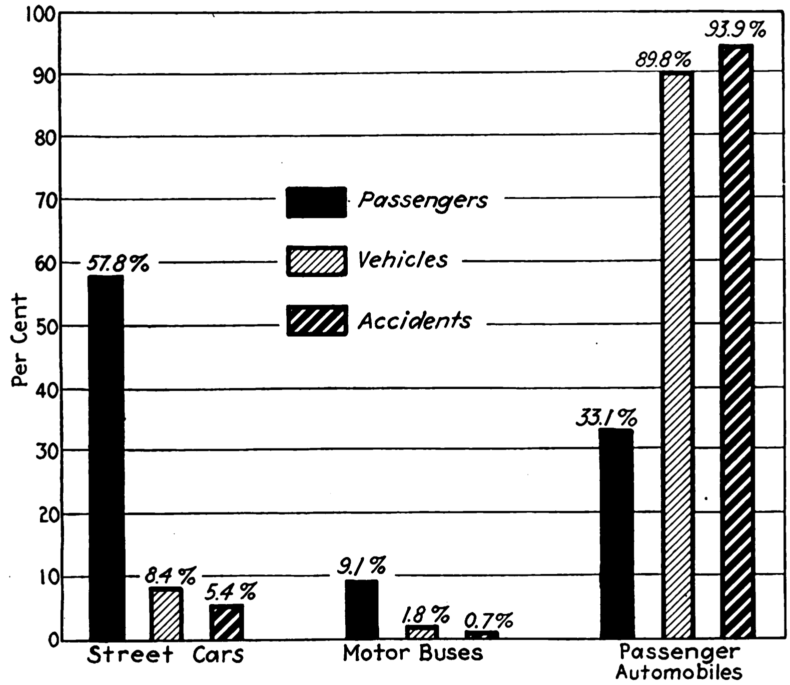
Sixty per cent of the people entering or leaving the Loop by street agencies use the cars. This, however, requires only a little more than 8 per cent of the vehicles evident during the day, and according to police records the surface cars and elevated combined are involved in but 5.4 per cent of the accidents. Compare this with the 33 per cent auto riders using 90 per cent of the vehicles and producing directly or indirectly 94 per cent of the street accidents!

More convincing than ever are these facts, coming as they do from unbiased sources. The entire report is perhaps the most extensive study yet made on street traffic, and while its conclusions are far reaching, they are not visionary. At the present conditions merely foreshadow those that will exist in the future. The appeal is made to lay the groundwork for common sense regulation that will help the traffic flow rather than hinder it. Chicago, as well as other great cities, may well face the facts and prepare along sound lines to meet this situation that even now seems almost baffling.

Street Traffic Analyzed in Chicago

Metropolitan Street Traffic Survey Made by Miller McClintock Under Auspices of the Chicago Association of Commerce Contains Many Valuable Data on Conditions as They Exist Today—Recommendations Based on Forecasts of the Future Are of Far-Reaching Importance—Surface Cars Found to Perform Efficient Transportation Service

WITH a full realization that the streets of a city are the most important element in its economic usefulness, the Chicago Association of Commerce undertakes to make basic recommendations for the future use of such arteries that will give the greatest service to all. The recommendations contained in the Metropolitan Street Traffic Survey of the street traffic of Chicago and the 40-mile territory adjacent to it are simple and do not involve enormous expenditures. Segregation of various kinds of traffic, improved regulation tending to produce a more efficient use of the streets and provisions for safety are fundamentals on which the recommendations are based.



Comparison of Mass Transportation by Street Cars with Mass Traffic by Automobiles

More than 800,000 people using vehicles on the streets enter or leave Chicago's central district each day between 7 a.m. and 7 p.m. Note the efficiency of the street cars and buses as compared to the private automobiles.

A proposed traffic ordinance defining the methods of vehicle operation with suitable rules and regulations is included in the report. Formation of a street traffic commission, twelve members in all, including the Mayor, the commissioner of public works, corporation counsel, superintendent of police, the president of the board of local improvements, chief justice of the Municipal Court, the commissioner of gas and electricity, chairman of the Chicago Plan Commission and one representative from each of the political subdivisions of greater Chicago, is recommended to act as the co-ordinating body on all matters related to street traffic. In addition, a division of traffic engineering is planned to work as a function of the bureau of streets under the jurisdiction of the Department of Public Works.

Story Gleaned from Chicago's Street Traffic Survey

These data show the utilitarian value of the surface car as a means of handling the masses with a minimum of vehicles and accidents.

	Passengers Carried	Per Cent	Vehicles Used	Per Cent	Accidents	Per Cent
Street cars	568,925	57.8	16,901	8.4	212*	5.4
Motor buses	89,369	9.1	3,633	1.8	29	0.7
Passenger autos	325,524	33.1	180,846	89.8	3,705	93.9
Totals	983,818	100.0	201,380	100.0	3,946	100.0

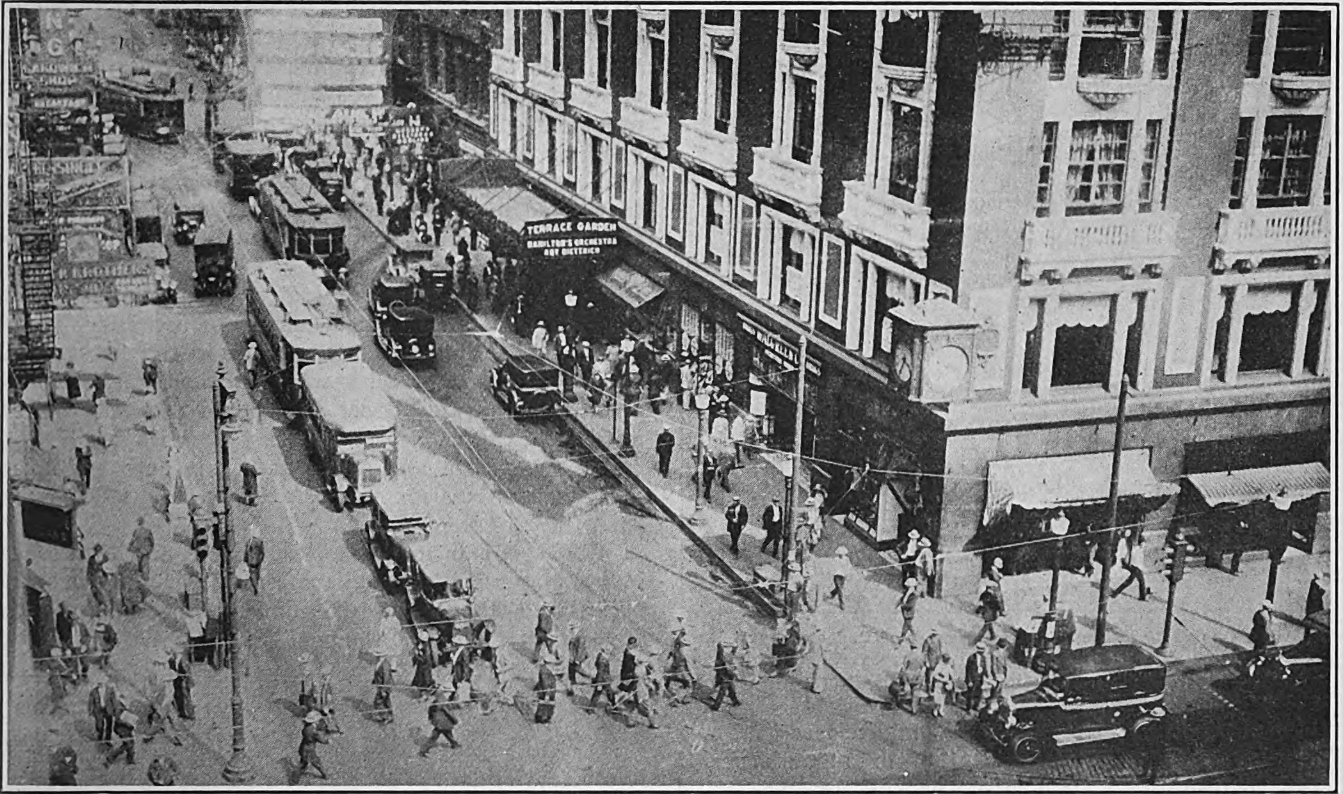
* Includes elevated and surface cars, no segregation being given. Number of accidents are for the three months of May, June and July, 1926, and cover the entire city under the jurisdiction of the Police Department.

Reorganization of the traffic division of the Police Department is deemed necessary in the administration of the proposed traffic ordinance. "Firmer and more systematic enforcement of traffic law in the courts" is also considered necessary to improve conditions. In this connection the report states that "Traffic laws will be obeyed without compulsion in direct ratio to their reasonableness." While the police responsibilities are many, and the function of arrest of willful or careless violators is minor, the fact that this class of violators is responsible for so many accidents and loss of life and property should cause it to be systematically followed up and summarily dealt with through the courts.

Regulation and not punishment is of perhaps greater importance, and to this end the report deals at length with traffic signs and signals to guide the motorists and to provide greater freedom of movement with a lessened accident hazard.

As told in the ELECTRIC RAILWAY JOURNAL in the issue of Dec. 25 this survey was made by the Chicago Association of Commerce under the direction of Dr. Miller McClintock, head of the Albert Russel Erskine bureau for street traffic research in Harvard University. The report of the survey was directed to the Mayor and Chicago City Council and signed by William R. Dawes and Elmer T. Stevens, president of the association and chairman of the street traffic committee, respectively. Functioning with Dr. McClintock and the technical staff was the administrative board of the Chicago Association of Commerce and eleven advisory committees on as many distinctive subjects.

As a basis for the suggestions offered, the survey presents a vast array of traffic statistics that indicate the thoroughness of the work. Space permits the reproduction of only a few of the salient findings, and those



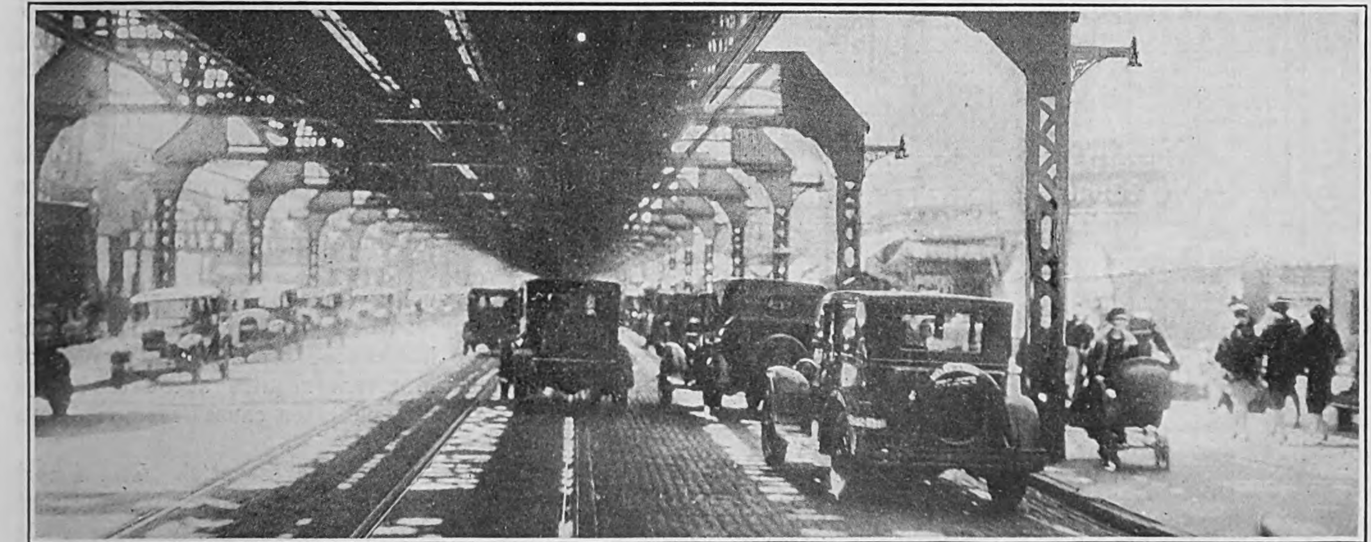
Absence of Loading Zones and Adequate Traffic Regulation Delays the Progress of Street Cars and Their Larger Number of Patrons. In This Typical Instance Two Private Automobiles and a Bus Prevented an Electric Car from Approaching the Corner Despite the Fact that the Curb Lane Was Unobstructed

of greatest interest to the electric railway industry have been selected.

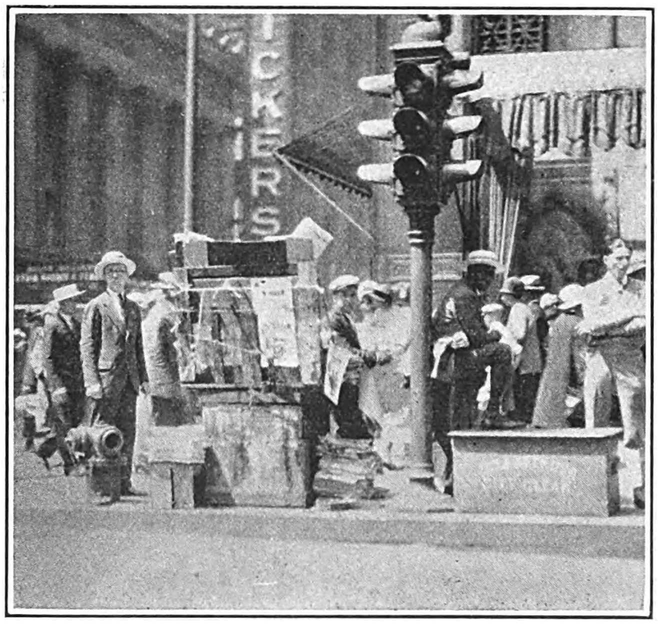
It is self-evident from the charts and tables reproduced that surface car performance stands supreme in its utility as a transportation agent. About a million people come into the central business district every day. According to the cordon count of this district made in May, 1926, exactly 1,693,506 persons entered or left this district in the twelve-hour period from 7 a.m. to 7 p.m. on the average weekday. Assuming that all who entered the district left it the same day it would appear that 846,753 persons, or 25 per cent of Chicago's population, went downtown to work or shop every day during these hours alone.

The count indicated that 80.8 per cent of these people used mass transportation agencies, as shown in an accompanying table, and 19.2 per cent used private automobiles. Likewise, 58.1 per cent used street agencies and 41.9 per cent "off-street" agencies such as steam roads, elevated or electric interurban.

The relative importance of the street car is of particular interest. An accompanying table and chart indicate that the street cars entering the Loop carry 57.8 per cent of all people using street agencies, buses carry 9.1 per cent, and 33.1 per cent ride downtown in automobiles. The disproportionate street occupancy of these different classes supports the street car still further. The 57.8 per cent of car riders required but 8.4 per cent of the vehicles, while the 33.1 per cent of automobile passengers required 89.8 per cent of the vehicles.



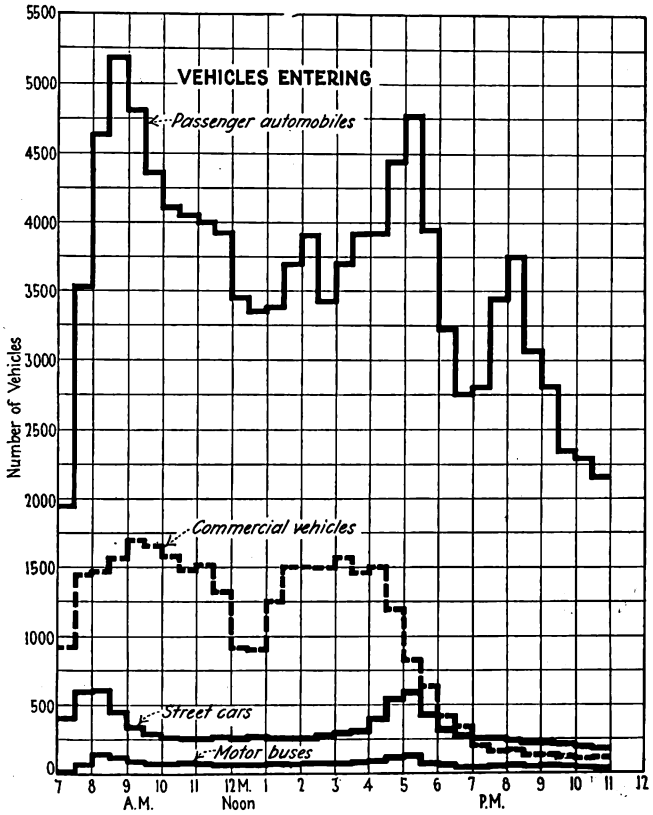
Curb Supports of the Elevated Structure on 63d Street, Chicago, Are an Important Improvement Which Benefits Street Traffic



Sidewalk Obstructions Impede the Progress of Pedestrians at Busy Intersection in Chicago and Should Be Removed, According to the Recommendation of Miller McClintock

From another part of the report it is disclosed that only 5.4 per cent of accidents for the three-month period May to July, 1926, inclusive, reported by the Police Department involved street cars or elevated trains, 0.7 per cent buses and 93.9 per cent private automobiles. No segregation is given as between surface and elevated cars in the accident data.

Despite the less efficient use of public streets, the report distinctly recognizes the economic value of the private automobile, saying in part: "Automotive transportation has wrought a basic modification in man's attitude toward time and distance and has had a fundamental effect upon every aspect of urban life. It is inevitable that such a change should necessitate many readjustments in private business and in public administration. The manufacturers of automobiles have gone far in fitting their vehicles for conditions under which they must operate. From now on it is necessary that some more constructive steps should be taken in adjusting operating conditions to the needs of the vehicle."



Vehicles Entering the Central Business District in Chicago Have Peaks at 9 A.M. and 5 P.M., as Revealed by the Cordon Count of the Chicago Street Traffic Survey

Further on the report states "that the increasing automotive use in the past quarter of a century is only a forecast of what will take place in the future. All considerations of street traffic conditions, and all plans, both in the way of street design and in traffic control, must take cognizance of the fact that the problem of street congestion and street safety is only beginning, and that the burdens of the future will be much larger than those of the present."

With a population of 3,048,000, the city of Chicago has a motor vehicle registration of 341,468—probably slightly less than the actual number owned and operated in the city. For 1950 the population has been estimated at 4,380,000 and the motor vehicles at 876,000. The loading at present is 8.9 persons per car and in 1950 is estimated at five persons per car. For the metropolitan district, assumed for the report as the territory within a 40-mile circle, the population is estimated in 1950 as 6,408,500 riding in 1,281,700 motor vehicles.

Industrial Workers Heavy Users of Street Cars

Mode of transport used by 95 per cent of the 37,946 employees of the Hawthorne plant of the Western Electric Company, shown in the Chicago Street Traffic Survey. Most of these employees come to work between 7:30 and 8:30 a.m.

	Per Cent
Surface cars	60.2
Elevated	13.3
Steam (C., B. & Q.R.R.)	2.6
Automobiles	2.6
Walked	17.8
Unidentified	3.5
Total	100.0

CERTAIN FACTORS HAVE INCREASED STREET TRAFFIC

Freight terminals that form a fringe around the central business district on the north, west and south, with the docks on the east, add the greatest amount of traffic burden to the business streets. During the month of March, 1926, 69,508,959 lb. of freight in 13,806 loads was moved in interterminal transfer alone over the streets of the central district. In addition, dock to freight terminal movements during the same month amounted to 16,283,879 lb. in 1,803 loads. This does not include freight having origin or destination points in the central district, but means transfer shipments via street surface only. It is of interest to note that the Chicago Tunnel Company handles almost an equal poundage in its elaborate system of tunnels under the central district.

Natural barriers such as Lake Michigan and the rivers are cited in the report as greatly complicating the city growth. The lake has caused a semi-circular plan of development and the rivers require adequate bridge facilities. The river traffic often causes serious delays due to open bridges.

Paved streets are considered essential. The report emphasizes that "the most direct physical relief that could be brought to the Chicago traffic problem would be an energetic and comprehensive paving program."

Despite the increase of paved streets the automobiles have increased faster. In 1908 there were only 3.8 automobiles per mile of paved street, whereas in 1925 there were 139. Street design is discussed. High crowns cause discomfort and difficulty in steering, especially of trucks. This results in greater use of the center or top of the crown and seriously affects street capacity and safety.

On traction streets the rails often form the smoothest riding, resulting in an uneconomical street usage and delay to surface cars. Rounded curbs at corners facilitate turning movements of automobiles and reduce the accident hazard of such movements. Elevated pillars also reduce street capacity and the report contains a recommendation for their removal to the curb. Public and private encroachment on street and sidewalk space should also be minimized.

A Quarter of Chicago's Population Goes to Work or Shop Daily in the Central Business District

The cordon count of the Chicago Street Traffic Survey reveals the utility of the street car as the most important and efficient street agency in use today, as well as the carrier of the largest group of riders.

Mode of Transportation	Number of Passengers	Per Cent
Street car	568,925	33.6
Elevated	473,736	28.0
Steam railroad (suburban)	192,909	11.4
Steam railroad (through)	29,173	1.7
Electric interurban	13,870	0.8
Motor bus	89,369	5.3
Passenger auto	325,524	19.2
Total	1,693,506	100.0
Mass transportation	1,367,982	80.8
Passenger auto	325,524	19.2
Total	1,693,506	100.0
Street agencies	983,818	58.1
"Off-street" agencies	709,688	41.9
Total	1,693,506	100.0

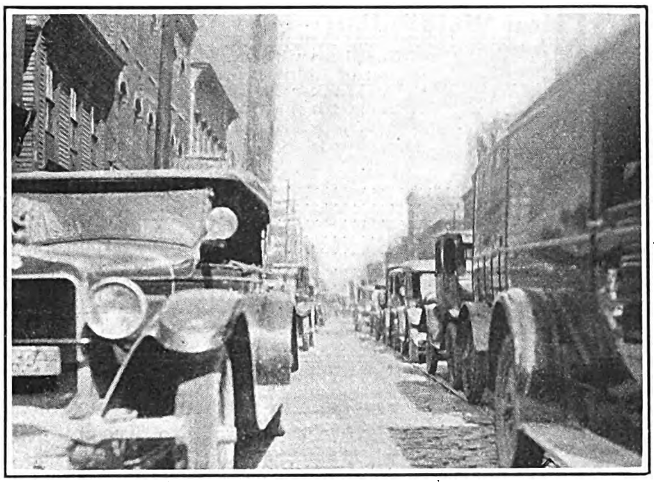
A lack of adequate regulation is responsible for much congestion. Irregular turning movements and unnecessary use of the streets also add to traffic density. Taxicab operation is cited as an indication of dead traffic and a count was taken during a typical business day at State and Madison and also at the Link Bridge. At State and Madison 1,218 cabs, or 26.3 per cent of those observed, were loaded and 3,429, or 73.7 per cent, were empty. At the Link Bridge 2,893, or 49.3 per cent, were loaded and 2,973, or 50.7 per cent, were empty. A total of both points observed indicated that 60.9 per cent of the taxicabs were empty and is an indication of the cruising habits of this class of carrier, although many cabs may have been moving to and from calls.

COST OF CONGESTION AND ACCIDENTS HIGH

Decentralization is the direct product of congestion. In Chicago this is true as in other cities, such as New York, Boston and Los Angeles. Chicago now possesses 75 major and 20 minor neighborhood or package goods districts. Also 173 outlying banks exist with deposits of $615,000,000. This is cited as the result of a demand for greater accessibility, especially by automobile patronage.

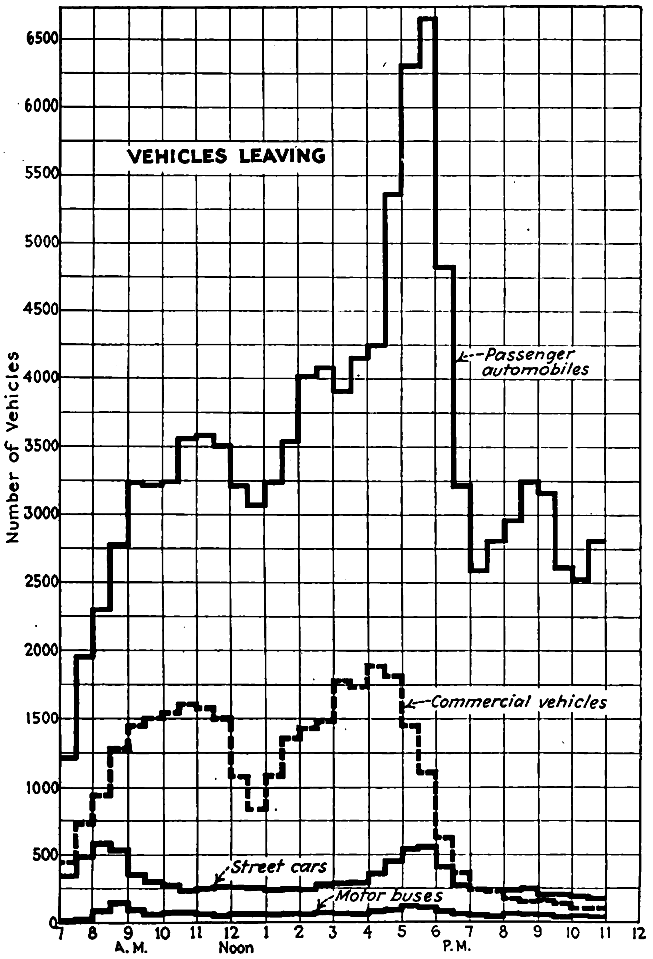
On the assumption that 10 per cent of the unit hours of work could be saved by partially relieved congestion a daily saving could be made of $75,820, or $27,215,200 annually.

Accidents, in addition to the above, are estimated to cost $17,000,000 annually.*



When Parked Cars Absorb the Paved Traffic Lane at the Side of Narrow Streets the Moving Vehicles Use the Tracks to the Detriment of the Masses

Of the motor vehicle fatalities in the United States, numbering 22,500 for 1925, Chicago contributed 2.9 per cent. A study based on May, June and July, 1926, indicated that the frequency of accident occurrence was much greater between the hours of 5 and 6 p.m. and is attributed to the greater fatigue of motorists and pedestrians at this time of day, as well as the increased congestion. A chart on page 74 indicates this situation and another shows the vehicles involved in accidents.



Vehicles Leaving the Central District Form a Higher Peak than When Entering

The greater peak is just before 6 p.m., immediately following a secondary peak of vehicles entering this district, as shown by chart on opposite page.

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*If all the automobiles and trucks operating in Chicago were insured for public liability and property damage at the prevailing rates the total premium would approximately equal this sum.

How 96,000 Patrons of Mercantile Establishments Arrived in Downtown Chicago

Based upon this extensive series of interviews covering one day the Chicago Association of Commerce would ban all parking in the central district of Chicago, bounded by Wacker Drive on the north, Michigan Avenue on the east, Harrison Street on the south and Market Street on the west, between the hours of 7 a.m. and 6:30 p.m.

Establishments	Total Patrons	Suburban Trains	Per Cent	Elevated Trains	Per Cent	Street Cars	Per Cent	Motor Coach	Per Cent	Taxi-cabs	Per Cent	Automobiles Totals	Per Cent	Park at Curb	Per Cent
Department stores	68,621	12,875	18.5	23,176	33.3	19,370	27.8	8,881	12.7	709	1.0	4,610	6.70	1,013	1.47
Office building	9,432	2,334	24.7	3,404	36.0	1,906	20.2	505	5.5	85	0.9	1,198	12.70	167	1.77
Banks	8,421	1,900	22.6	2,884	34.3	2,308	27.4	405	5.3	79	0.9	800	9.50	144	1.71
Musical instrument stores	2,649	499	18.8	1,016	38.4	567	21.4	315	11.9	42	1.6	210	7.90	61	2.29
Furniture stores	2,378	449	18.8	855	36.0	498	21.0	291	12.3	22	0.9	263	11.0	45	1.88
Shoe stores	1,064	158	14.9	311	29.2	169	15.8	211	19.8	33	3.1	182	17.2	32	3.02
Restaurants	2,405	507	21.0	748	31.1	343	14.3	307	12.8	122	5.1	378	15.70	41	1.69
Book stores	112	20	17.2	25	21.6	30	25.8	20	17.2	.....	...	21	18.20	2	1.74
Grand total	96,082	18,742	19.5	32,419	33.8	25,191	26.2	10,980	11.4	1,092	1.1	7,662	8.00	1,505	1.57

A reduction of 23 per cent of personal injury automobile accidents has been noted in the five months following the installation of the co-ordinated traffic signals in the Loop, in addition to reducing materially street car and vehicular running time in this district.

TRAFFIC MUST BE CONTROLLED

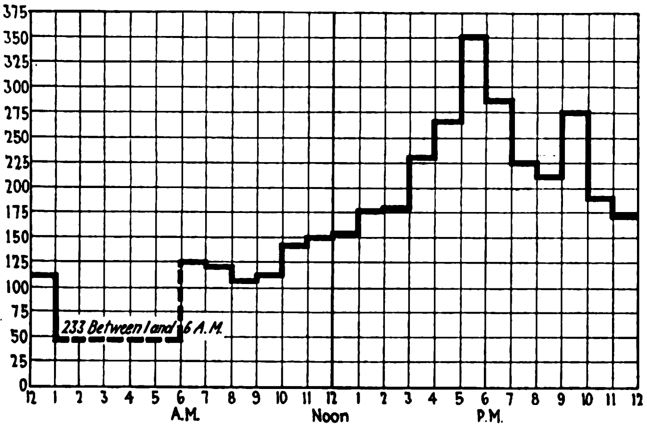
One chapter is devoted to the control of traffic. Street cars should be given the right of way by requiring vehicular traffic to avoid blocking tracks when cars are approaching. Street car stops should be provided with clearly defined safety zones and vehicle drivers must not be allowed to drive through such zones, whether occupied or not.

Surface cars should minimize loading time in the central district by using street loaders and change makers where possible. Motor coaches should be provided with clearly marked loading points arranged not to interfere with surface car loading zones. Recessed curbs the width of the bus could be provided in certain streets. Buses should never be allowed to load while standing in the second lane from the curb.

The valuable results obtained by prohibiting left turns in the central district have been somewhat impaired by permitting left turns in the middle of the block. Observations made indicate that 78.8 per cent of such turns caused delays that when reduced to a man-minute basis averaged 6.84 minutes per turn.

THE PEDESTRIAN NEEDS PROTECTION

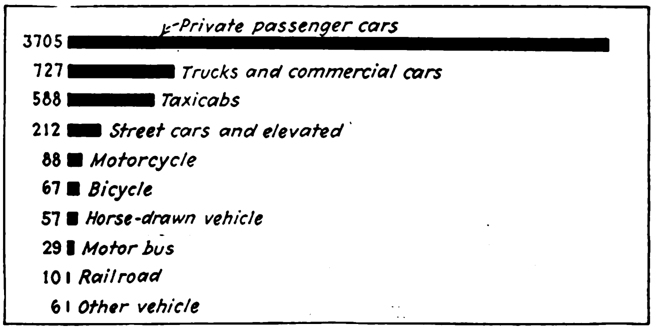
Checks show that pedestrian speeds average 3.16 m.p.h. on typical streets in the central district, which is reduced to 2.81 m.p.h. with the congestion of the late afternoon hours. An observation on a Saturday in May, 1926, showed that 195,930 people entered the intersection at State and Madison in five afternoon hours. The peak hour showed 49,250 persons and the peak quarter hour 13,190.



Frequency of Motor Vehicle Accidents by Hours

Fatigue and peak traffic combine to produce the greatest number of accidents between 5 and 6 p.m.

From these and other observations the conclusion is drawn that pedestrian traffic on sidewalks as well as at street intersections must be regulated. Sidewalk obstructions must be removed, stopping midstream must cease and all possible causes of congregations must be eliminated. Pedestrian subways under Michigan Avenue to the Illinois Central station have proved practical and checks show their use is in excess of the original estimates. The report carries the recommendation that pedestrian subways be used at other places, but not in congested streets because of the difficulty of providing approaches.



What Causes Accidents?

The chart here shows the type of vehicle involved in all motor vehicle accidents in Chicago for months of May, June, July, 1926. Most of the accidents involve private passenger cars. Surface cars and elevated trains, although providing the background of passenger transportation, have very few accidents.

THE PARKING PROBLEM

The parked cars of the few must give way to transportation of the many. Parking checks were made in five square blocks of the central district which had a possible parking capacity of 300 cars. Observations revealed the fact that the average number parked between 7 a.m. and 7 p.m. was 170, or 57 per cent of the maximum possible. The hour from 2 to 3 p.m. is the peak, during which time 231, or 77 per cent of the maximum number, were parked. The present regulation calls for a half-hour parking limit, but the check revealed the fact that 1½ hours is the average duration of parking time.

Surveys in outlying business districts indicate that three hours is the average parking time and the peak hours are at night.

Within the area bounded by the elevated loop there is a curb footage available for parking sufficient to accommodate 1,157 vehicles at one time. If the half-hour parking limit was rigidly adhered to 27,768 vehicles could be parked in a twelve-hour day. This would accommodate but 15 per cent of the demand placed upon the streets of this district. The primary effect on street capacity of this small accommodation is a reduction of 30 to 50 per cent. The secondary effect is that little or no space is available for the actual loading and unloading of passengers and merchandise.

Basic reasons for traffic regulation are greater safety and improved business. The first is obvious. To determine the latter some 96,000 patrons of different firms were interviewed. Of these 90.9 per cent arrived by common carriers, 1.1 per cent by taxicabs and 8 per cent by automobile. Of the latter only 1.57 per cent parked their cars at the curb. This complete check is shown in tabular form on page 74 and is one of the most important features of the report.

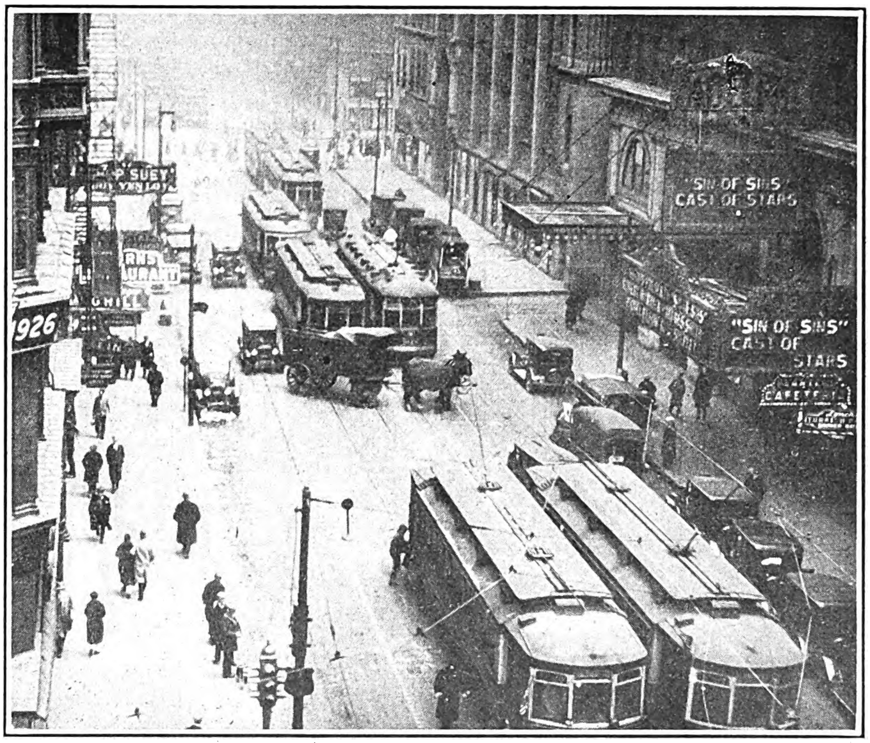
Based upon the extensive series of interviews which tends to blast the mistaken idea of the value of parking facilities to merchants on congested streets, the Association of Commerce recommends that parking for longer periods than necessary actually to load or unload passengers or merchandise be entirely prohibited in the central district between the hours of 7 a.m. and 6:30 p.m. The construction of garages and off-street parking areas is urged, as is also the further development of Grant Park, now accommodating hundreds of machines.

Outlying business districts should also be limited by empowering the commissioner of public works to erect signs, and the Police Department to enforce a two-hour parking limit between 7 a.m. and 6:30 p.m.

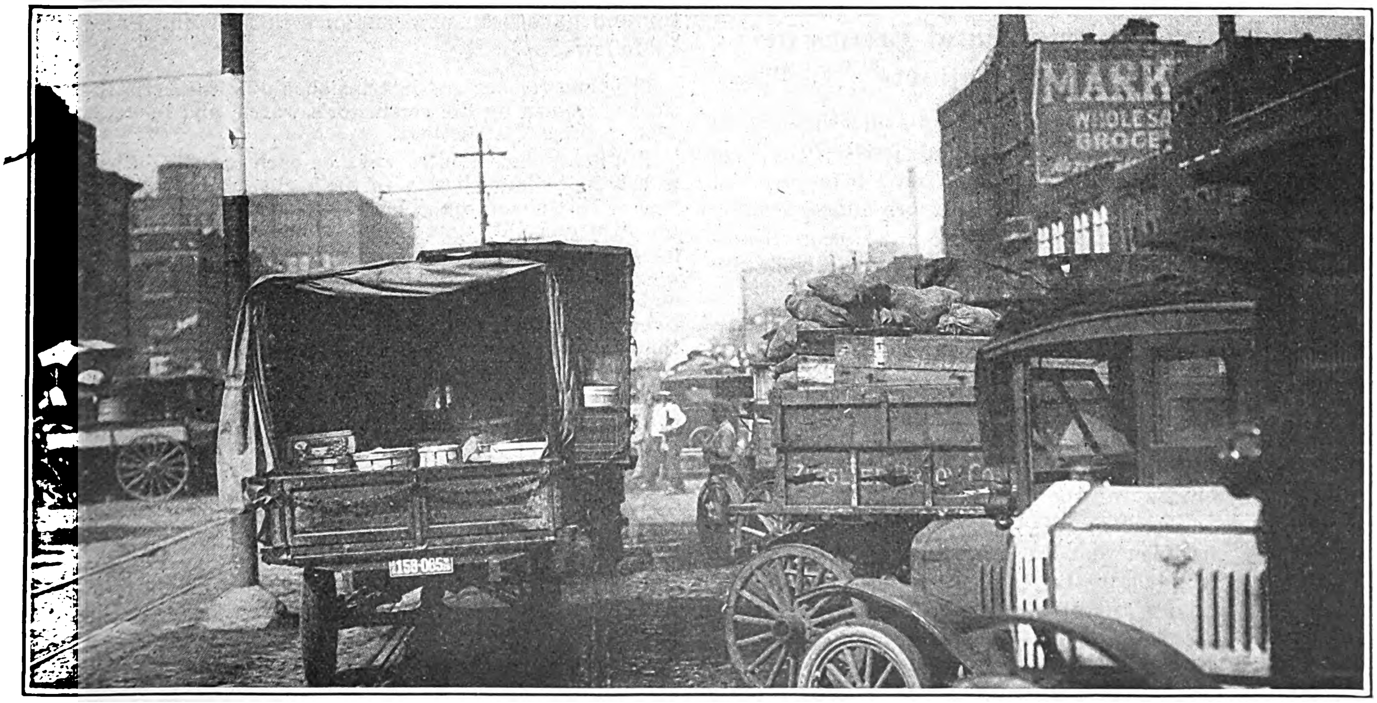
MORE TRAFFIC SIGNS AND SIGNALS NECESSARY

"Stop and go signals should rarely, if ever, be installed for purely safety purposes. The primary purpose of the signal is to start and stop traffic to facilitate movement." Boulevard stops and other warning and guiding signs are recommended to help the motorists in rapid although safe movement. Installation of automatic "stop" and "go" signals at points where traffic conditions do not warrant such regulation invites a violation of such signals and thus creates a dangerous habit. It would be one of the duties of the proposed engineering division to avoid impracticable signals.

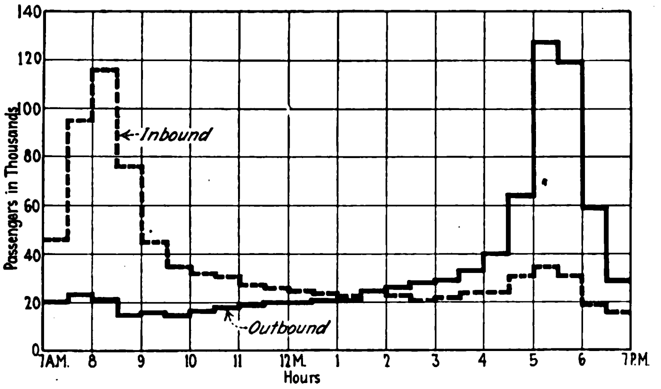
The co-ordinated system in the Loop has proved so successful that its extension to other districts is recommended. Much space is used in the discussion of the amber light. The report favors relatively a longer



With the Abolition of Left Turns in the Chicago Loop, Midstreet Turns Are Permitted, but with Inevitable Delays, as Illustrated



Angle Parking on Narrow Chicago Streets Leaves Only the Track Area Free for Moving Vehicles period, and that it should be shown alone without the red or green. The amber light should stop all vehicular traffic and be used for pedestrian crossing. No signal should be "dead," and when the signals are not necessary during late evening and night hours the amber light should be arranged to flash "on" and "off" as a caution warning.



Passengers Entering and Leaving Central Business District in All Forms of Transportation for One Typical Day in May, 1926, between 7 A.M. and 7 P.M.

Peak load ratios of five to one greatly congest the arteries connecting Chicago's central district with the residential portions. Mass transportation and "off street" facilities greatly lessen the street burden during these hours.

To avoid confusion, there should be a standardization of signal and sign types and of systems used.

TRAFFIC POLICE AND THE COURTS

Two chapters are devoted to an analysis of the traffic police division and the traffic courts. A complete reorganization of the traffic police division is recommended and firm and uniform handling of traffic violators on the part of the courts is urged.

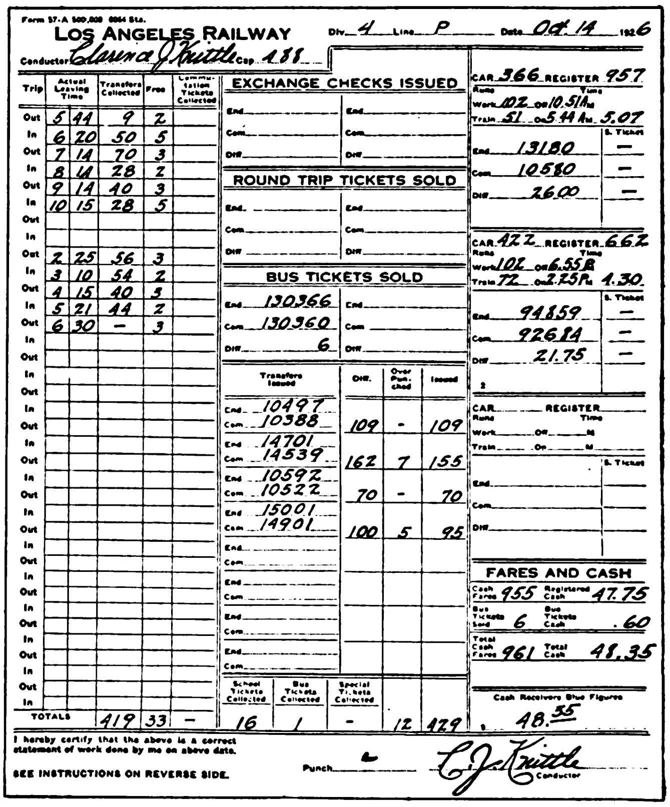
Centralization of administrative responsibility is recommended and suggestions are made for the formation of a Chicago traffic commission and a department of traffic engineering.

Reducing Omissions and Errors in Conductors' Reports

REGISTER CARDS, trip sheets and all other forms on which trainmen of the Los Angeles Railway, Los Angeles, Cal., make their reports have been evolved through a careful study of various errors and omissions on previous forms. The forms used have been simplified so as to require only information that is absolutely necessary.

In 1920 the number of omissions and errors on trip sheets, register cards, etc., used by the Los Angeles Railway was so great that the auditing department devised and put into use a form calling to the conductor's attention his omissions and errors. At that time such reports covering the trip sheets for one day were sent to 60 per cent of the conductors then in service. By the continuous use of this form thereafter this percentage has been reduced to a normal figure. Now the work of conductors on trip sheets, register cards, ticket and transfer turn-ins on the whole is more than 95 per cent accurate.

A careful survey of the records relating to the work done by conductors for the first nine months of the present bonus year led the auditing department to list those who were doing the best work on such reports. The points considered were legibility, neatness, accuracy, completeness and apparent special effort, and the method used in weighing and combining these points segregated the men into the following classes: Very poor, poor, average, good and exceptionally good. The names of 232 men in the good class and 73 in the exceptionally good class were given to the manager of transportation with the auditor's recommendation that they be awarded merits.



Form 57-A 500,000 6064 Sta.

LOS ANGELES RAILWAY Div. 4 Line P Date Oct 14 1926

Conductor Clarence J. Knittle Cap. 488

Trip	Actual Leaving Time		Transfers Collected	Free	Commutation Tickets Collected
Out	5	44	9	2	
In	6	20	50	5	
Out	7	14	70	3	
In	8	14	28	2	
Out	9	14	40	3	
In	10	15	28	5	
Out					
In					
Out	2	25	56	3	
In	3	10	54	2	
Out	4	15	40	3	
In	5	21	44	2	
Out	6	30	–	3	
In					
Out					
In					
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Out					
In					
Out					
In					
Out					
In					
Out					
In					
Out					
In					
TOTALS			419	33	–

EXCHANGE CHECKS ISSUED

End. End.
Com. Com.
Diff. Diff.

ROUND TRIP TICKETS SOLD

End. End.
Com. Com.
Diff. Diff.

BUS TICKETS SOLD

End. 130366 End.
Com. 130360 Com.
Diff. 6 Diff.

Transfers Issued	Diff.	Over Punched	Issued
End. 10497 Com. 10388	109	-	109
End. 14701 Com. 14539	162	7	155
End. 10592 Com. 10522	70	-	70
End. 15001 Com. 14901	100	5	95
End. Com.			
End. Com.			
End. Com.			
End. Com.			

School Tickets Collected	Bus Tickets Collected	Special Tickets Collected		
16	1	–	12	429

CAR 366 REGISTER 957
Runs Time
Work 102 on 10.51 Am
Train 51 on 5.44 Am 5.07

	S. Ticket
End. 13180	—
Com. 10580	—
Diff. 2600	—

CAR 422 REGISTER 662
Runs Time
Work 102 on 6.55 P
Train 72 on 2.25 Pm 4.30

	S. Ticket
End. 94859	—
Com. 92684	—
Diff. 21.75	—

2

CAR REGISTER
Runs Time
Work Off M
Train On M

	S. Ticket
End.	
Com.	
Diff.	

FARES AND CASH

Cash Fares 955 Registered Cash 47.75
Bus Tickets Sold 6 Bus Tickets Cash .60
Total Cash Fares 961 Total Cash 48.35

Cash Receivers Blue Figures
$ 48.55

I hereby certify that the above is a correct statement of work done by me on above date.

SEE INSTRUCTIONS ON REVERSE SIDE.

Punch

C. J. Knittle Conductor

Conductor's Trip Sheet as Used by the Los Angeles Railway

Some of the reminders which are given the conductor and have been of assistance in reducing errors are as follows:

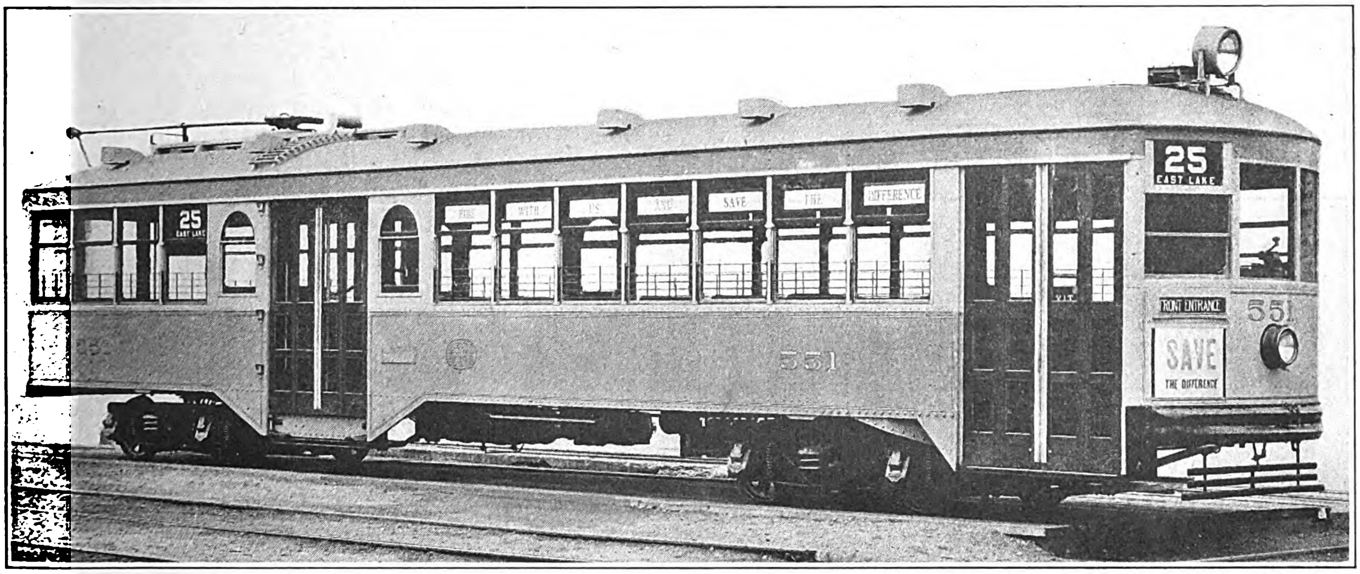
> The time for out and in trips should be the actual leaving time as shown by the conductor's watch, and in accordance with printed instructions.
>
> The hours and minutes work on each car should be shown in the space immediately to the right of the "On and Off" time. This should be given separately for each car. Also, the "On and Off' time should show whether it is a.m. or p.m.
>
> Some conductors show only the portion of the ending and commencing numbers of bus tickets and round-trip tickets sold. The entire number should be given in order that the auditing department may be able to trace any particular ticket or make an analysis of ticket traffic.
>
> All spaces that are applicable to "Work Run" should contain figures or dashes. The dash is preferable to other marks, since if these latter are poorly executed they may be taken for figures, and so result in errors.

A Correction

In the issue of the JOURNAL for Nov. 25, 1926, page 957, in the article giving statistics on freight container shipments between Boston and Worcester, the figures were given in "tons." They should have been specified in pounds.

Birmingham Pleased with Its New Cars

Careful Attention to Local Requirements Was Given in Designing the Sixteen Units Recently Delivered—The Cars Are Truly "All Dressed Up," but They Do Not Lack for a Place to Go—Noise Reduction and Interior Decoration Are Important Features

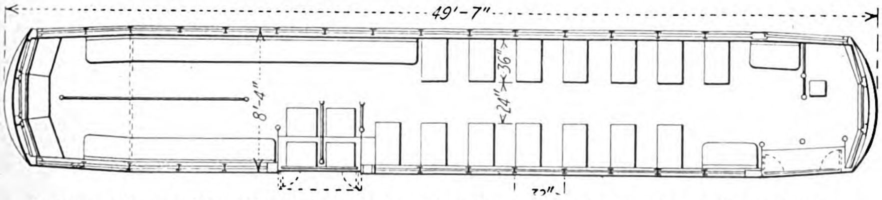


One of the Sixteen New Cars Which the Birmingham Company Has Purchased to Improve Further the Quality of Its Transportation Service

WITH a desire to eliminate noise to as great an extent as possible in the sixteen new cars recently delivered to the Birmingham Electric Company, Birmingham, Ala., all trapdoors have been omitted from the floor and oiling and inspection will be done from underneath. As a further step in attaining the desired end helical gears have been used and the bolsters are filled with ground cork and cement. Where they connect at the side with the framing of the cars the bolsters are insulated with ¼-in. linoleum, securely fastened between the end of the bolster and the side sill.

Making it imperative for oiling and inspection to be carried on from without serves a further purpose than simply reducing the amount of truck noise which reaches the passengers. It effectively keeps the inspectors from entering the cars and soiling the plush seats and other features of the interior fittings through contact with their clothing and persons.

The sixteen cars just delivered are similar in general design and over-all dimensions to the standard single-end, double-truck, center-exit units which have been in service in Birmingham heretofore. They possess, however, a number of refinements in detail and in various features of appearance and comfort which will recommend them to the attention of railway men. Built by the Cincinnati Car Company, no effort has been spared in incorporating into the design all practicable ideas which will enhance the selling appeal of the transportation units.



Seating Plan of the Birmingham Cars, Showing the Arrangement of Longitudinal and Cross Seats Which Will Accommodate 60 Passengers

For example, there is the matter of the partition which has been erected at the front of the car just in the rear of the motorman's seat. It was desired to eliminate the unsightly appearance which it was felt the motorman's stool and curtain generally give. But on the other hand the designers wished to avoid having a plain and unadorned steel partition to confront the passengers, so a 24-in. x 26-in. beveled plate mirror was installed.

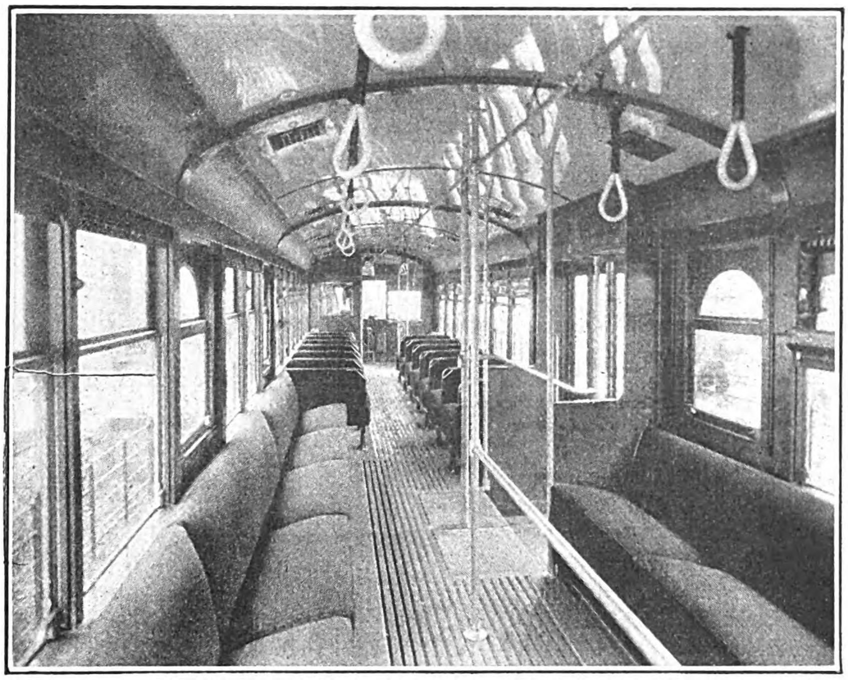
The seating arrangement consists of fourteen cross seats and additional longitudinal seats at the rear of the car. These latter, together with the row of seats extending across the extreme rear, will accommodate 32 passengers, making the total seating capacity 60. Before these new cars were placed in service fixed partitions had been used to separate the colored passengers from the white. In these units, however, this arrangement has been modified so that the amount of space set aside for colored passengers may be varied at will. This eliminates the necessity for white passengers having to stand while seats remain unoccupied in the colored section.

The new plan embodies the use of aluminum pipe stanchions and rails which may be adjusted as desired. Much pleasure has been evinced by patrons of the company due to the adoption of this more flexible arrangement. At the center of the side exit door there is another pipe stanchion which carries a lever for operating the center doors when two-man operation of the car is in effect.

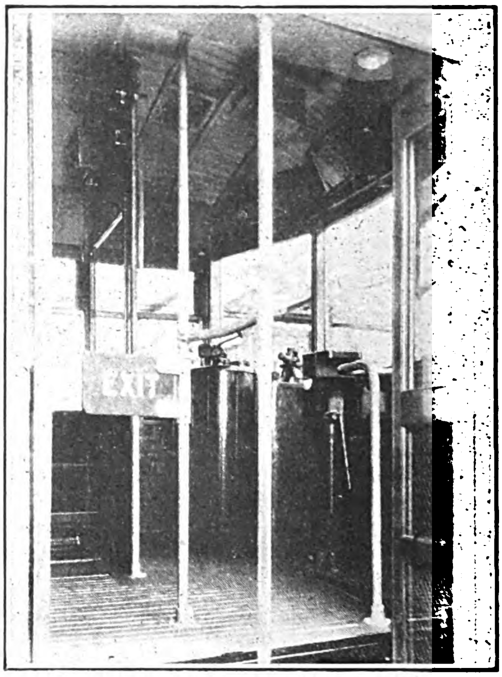
A harmonious interior appearance has been effected through the use of first quality, green, unclipped Pullman plush in upholstering the seats along with silk window shades which match them in color. Cherry finish has been used throughout, with the steel stippled to match where exposed to view. Brass sash have been used to provide a pleasing contrast with the window shades and interior trim, as well as to facilitate the raising and lowering of the windows. The seats throughout are of the deep spring type, and a further element in passenger comfort was effected in increasing the seat spacing from 29 in. to 32 in. The floor under the seats is covered with ¼-in. rubber tile, while the aisles and platforms are covered with 1½-in. oak mat strips fitted with brass channels between. The edges of the rubber tiling at the aisles are finished with brass angles. Interior lighting is accomplished with flush porcelain sockets set into the headlining, using 46-watt frosted lamps.

The exterior finish of the cars is Duco, except for the upper wood sash and doors. The side panels and letterboard are finished in delft blue, while the side posts, front dash and posts are painted in cream. The top sash and doors are finished in cherry and varnished. All lettering and striping are in gold.

One-man operation is entirely feasible with these cars. With a single operator the side exit doors are treadle operated, or, as stated before, they may be manually controlled by the conductor when two men constitute the crew. Complete safety car devices are used, the brakes and line breaker being interlocked with the doors so that the car cannot start with the door open. Both front doors are connected with a selective valve under the control of the motorman. The electrical equipment of the car consists of four 35-hp. motors, a K-35 KK controller and a line breaker.



In the Foreground Is the Aluminum Rail Which May Be Adjusted to Vary the Amount of Space Reserved for Colored Passengers

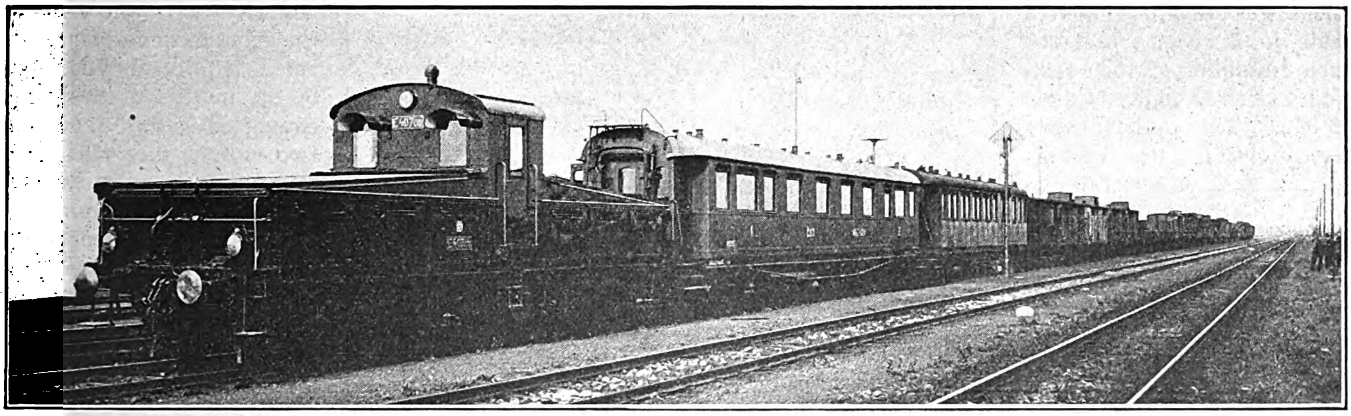


Directly Behind Exit Sign May Be Seen Steel Partition Which Shuts Off Motorman's Compartment from Passenger View

Placing these new units in city service in Birmingham has marked another step in the avowed program of the local company to raise its transportation service to the highest possible plane consistent with earning capacity. That the townspeople appreciate the efforts of the railway is clearly indicated in the quantities of written and verbal praise and congratulations which have been received.

SOME OF THE PRINCIPAL SPECIFICATIONS FOR BIRMINGHAM'S NEW CARS

Seating capacity	60
Weight:	
Car body	17,380 lb.
Trucks	9,300 lb.
Equipment	8,340 lb.
Total	35,020 lb.
Bolster centers, length	29 ft. 3⅝ in.
Length over all	49 ft. 7 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 8$\frac{11}{16}$ in.
Body	Semi-steel
Interior trim	Cherry finish
Headlining	¼-in. Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Sleeve
Axles	Pollak Steel Company
Bumpers	Cincinnati, pressed steel
Car signal system	Faraday buzzer
Car trimmings	Dayton Manufacturing Company
Center and side bearings	Cincinnati
Compressors	Westinghouse DH-16
Conduits and junction boxes	Flexible duct
Control	GE K-35-KK
Curtain fixtures	Curtain Supply Company No. 90
Curtain material	Pantasote
Destination signs	Hunter illuminated 129 LR
Door-operating mechanism	National Pneumatic
Fenders	H-B life guards
Finish	Duco
Gears and pinions	GE ratio 69-14
Hand brakes	Cincinnati 16-in. vertical wheel
Heater equipment	Consolidated Car Heating
Headlights	Electric Service Supply "Golden Glow"
Journal bearings	Sleeve
Journal boxes	Cincinnati Car Company Symington lids
Lightning arresters	GE aluminum cell
Motors	Four GE 265-A, 35 hp. inside hung
Registers	International No. 5
Safety devices	Safety Car Devices Company
Sanders	O. B. with No. 10038 traps
Sash fixtures	Dayton Manufacturing Company
Seats	Hale-Kilburn No. 208
Seating material	Chase Company "Friezette"
Slack adjuster	Cincinnati Car Company turnbuckle type
Springs	Union Spring & Manufacturing Company
Step treads	Feralun
Trolley catchers	O. B. No. 13141
Trolley base	U. S. 20-A
Trucks	Cincinnati Car Co. arch bar
Ventilators	Railway Utility exhaust, Cincinnati Car Company hatch type intake
Wheels	Southern Wheel Company 26 in., chilled iron
Special devices, etc.	Triple step treadle doors at both center doors



Storage Battery Locomotive Hauling Train at Wilson Terminal, Prague

Electric Railways of Czechoslovakia

The Largest City System Is at Prague, Where 500 Motor Cars and 450 Trail Cars Form the Equipment—There Are Also Interurban Lines in Czechoslovakia and Considerable Heavy Electrification Is Under Way

By Dr. F. Niethammer
Prague, Czechoslovakia

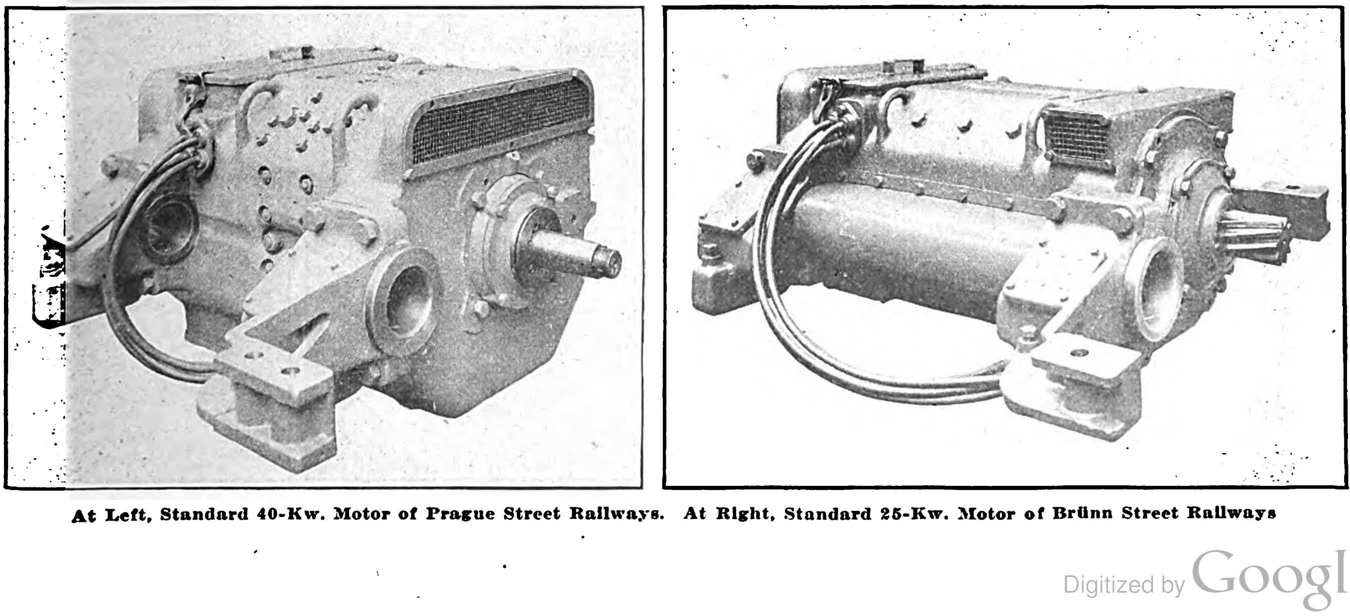
CZECHOSLOVAKIA has 256 km. (160 miles) of routes of city electric railways and 173 km. (109 miles) of interurban electric railway lines, according to recent statistics compiled by Ministerialrat Juranek. The largest system is at Prague, the capital of the country and a city of about 730,000 inhabitants. The track mileage in Prague amounts to 186 km. (116 miles), most of the routes being double track, and there are more than 500 motor cars and about 450 trail cars.

There are also a number of motor bus lines which are operated in supplementary service with the electric railways.

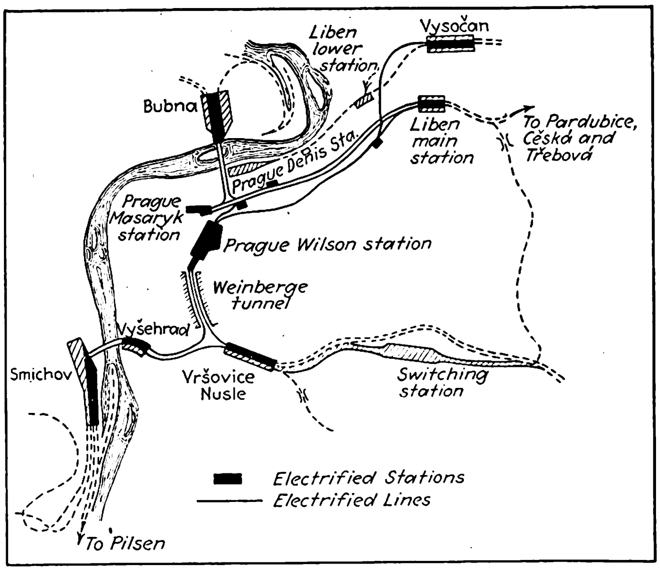
In 1925 the Prague Street Railway carried 173,400,000 passengers and operated more than 20,300,000 motor car kilometers and 11,100,000 trail car kilometers (12,700,000 motor-car miles and 6,937,500 trail-car miles). The receipts amounted to about $4,600,000, of which the operating expenses consumed 91 per cent. Power is taken from the municipal lighting and power system.

Although the lines in Prague have many curves and steep grades, some very good traffic records have been made. Thus, during the recent gymnastic festival, July 3 to July 6, 1926, more than 1,000,000 passengers were carried on the day of greatest traffic. The usual average on the Prague system is about 440,000. For this special festival 100 new motor cars and 100 new trail cars were purchased, some additional track was built and special schedules and routes were adopted to facilitate the transportation of people to and from the Stadium, or place where the gymnastic exercises were held.

At this point trains containing 200 passengers or more were dispatched at intervals of from sixteen to nineteen seconds, although the grades at this point are as high as 6 per cent. The number of night tickets sold on one of the days was 40,000, although night



At Left, Standard 40-Kw. Motor of Prague Street Railways. At Right, Standard 25-Kw. Motor of Brünn Street Railways tickets command an extra rate in Prague and the usual number of such tickets issued daily is only 5,000. The daily energy consumption during this period reached a maximum of 140,000 kw.-hr.



Map Showing Terminal Electrification at Prague

The motors used on the cars in Prague, as well as in Brünn, the next largest city in Czechoslovakia and the capital of Moravia, were supplied by the Skoda Works at Pilsen. In the accompanying illustrations views are shown of the latest motors as well as of the latest form of controller, which is of the camshaft type with mechanically operated contactors. The overhead construction is of the usual form for trolley wheel use and not for the bow type of trolley, as in many cities in central Europe.

Other cities in Czechoslovakia besides Prague and Brünn, which have standard gage street railways, are Kaschau, Olmütz and Pilsen. There are narrow gage street railway lines in Oderberg, Pressburg, Budweis, Gablonz, Iglan, Richenberg, Marienbad, Brüx, Troppau, Teplitz and Aussig.

INTERURBAN LINES

The three largest interurban electric railways in Czechoslovakia are as follows:

1. Tabor-Bechyne, 31 km. (20 miles) in length, in Bohemia. Tabor is on the direct railway line between Prague and Vienna.
2. The Tatra interurban system, 36 km. (23 miles) in length, in northern Slovakia.
3. Zartlesdorf-Lippen Railway, 28 km. (17 miles) in length, in south Bohemia.

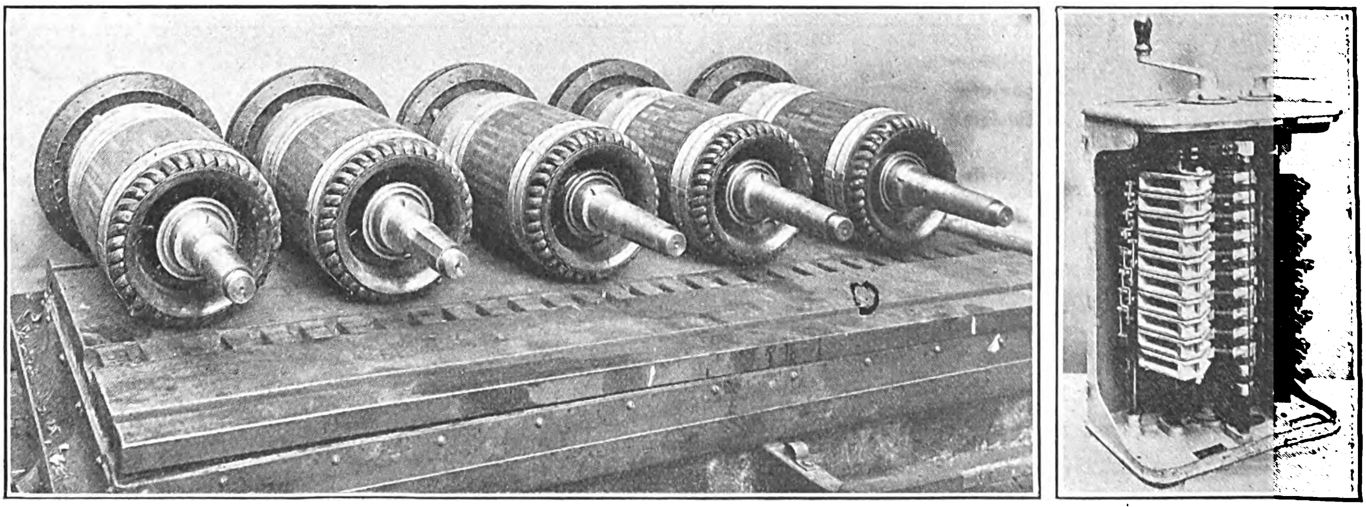
The first mentioned, a standard-gage line, was built by the Krizik Electric Company of Prague and has been in operation since 1903. An interesting feature is the system of power distribution, which is of a modified three-wire type. There are two overhead contact wires, one carrying 700 volts positive and the other 700 volts negative, with the rails as the neutral conductor. Each car is equipped with four 30-hp. motors permanently connected in two groups of two motors in series each, the middle point in each series group being grounded to the rail. The generators at the power station are wound to have an auxiliary set of brushes connected to the rail-ground, and in parallel with the generators is a storage battery also divided into two groups of cells with the connection between them joined to the neutral. Incidentally, it might be said, in 1905-06 the Krizik company built a 3,000-volt direct-current locomotive for Vienna on the same system; that is to say, with a difference of potential of 1,500 volts between each trolley wire and the ground. Each of the two driving axles of this locomotive was equipped with two 130-hp., 1,500-volt motors in series and connected to the driving axle by gearing.

The second interurban railway mentioned, the Tatra line, was built by the Siemens-Schuckert Works of Pressburg and the Ganz Company of Budapest. It operates through a region of splendid mountain scenery, with grades of more than 6 per cent. This line has the same system of distribution as that just described; that is to say, there are two overhead direct-current conductors, each with a difference of potential of 825 volts from the rails and of 1,650 volts difference between each other.

On one freight locomotive the motors are wound directly for 1,650 volts, but the motors on all of the other cars are wound for 825 volts.

The Zartlesdorf railway operates at 1,200 volts d.c. It was equipped by the Siemens-Schuckert Works in Vienna and has only four electric motor cars and a freight locomotive.

Of the three lines mentioned, the first is standard gage, the two others are narrow gage. There are several other smaller narrow gage lines in Czechoslovakia.



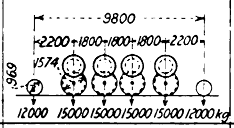
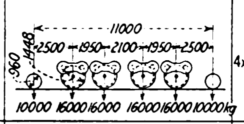
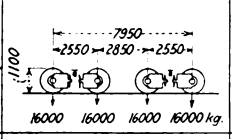
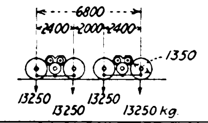
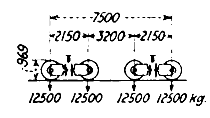
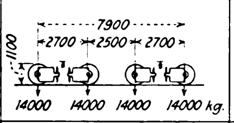
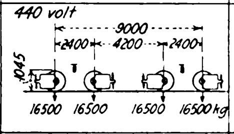
At Left, Row of Railway Motor Armatures. At Right, Camshaft Type of Controller. This Equipment Is Used in Prague

This list of interurban lines does not include the important Pressburg-Vienna electric railway as only a very short portion of it is in Czechoslovakia. The remainder of the trackage is in Austria.

MOUNTAIN RAILWAYS

In the Alpine sections, aerial cable lines for passenger service are beginning to replace rack railways and cable incline railways, as the aerial lines are much cheaper in first cost. Several of these aerial cable lines have been in operation for a long time near Bozen and Meran in the Southern Tyrol, and there are others in the Swiss and Austrian Alps. Two lines of this kind will soon be built in Czechoslovakia, one at Reichtenberg, the other at Johannesbad. The driving sheaves of these lines are operated by three-phase slip-ring motors, or by d.c. motors with Leonard control, and recuperation takes place when the down load is greater than the up load. Separate carrying and driving cables are used.

Data of Electric Locomotives of the Czechoslovakian State Railways

Locomotive	Contractors for Mechanical Part	Contractors for Electrical Part	Type	Number Ordered	Sketch of Locomotive	Number of Motors	Type of Motor	Gearing	Gear Ratio	One Hour Rating at Wheels in Hp.	Weight in Kg. Adhesion (on Drivers)	Weight in Kg. Total	Control	Total Length over Buffers in mm.	Speed in Km-Hr. Normal	Speed in Km-Hr. Maximum
Passenger and Express	Breitfeld Daněk	Křižik-B.B.C.	1+AAAA+1	2	 9800 2200 1800 1800 1800 2200 1574 969 12000 15000 15000 15000 15000 12000 kg	4	Interpoles, size poles Variable number of field turns	Buchli Gearing	1:3.205	Hp. at 1350 volts 1460	60,000	84,000	Electropneumatic BBC camshaft controller	14,760	50	90
	Škoda Works	Škoda Works	1+AAAA+1	3	 11000 2500 1950 2100 1950 2500 1448 960 10000 16000 16000 16000 16000 10000 kg	4x2	Interpoles and compensating winding	Quill Drive	1:3.68	1600	64,000	84,000	Electric driven camshaft controller	14,500	50	90
Freight	Českomoravská-Kolben	Českomoravská-Kolben	AA+AA	1	 7950 2550 2850 2550 1100 16000 16000 16000 16000 kg.	4	Interpoles, field shunting	Tramway suspension, Flexible axle wheel	20/59	1300	64,000	64,000	Electropneumatic Westinghouse control	11,870	50	90
				4					16/63						30	60
Switching	Škoda Works	Škoda Works	B+B	2	 6800 2400 2000 2400 1350 13250 13250 13250 13250 kg.	2x2	Interpoles and compensating winding	Quill Drive	1:6.066	800	53,000	53,000	Electropneumatic	10,200	30	50
	Adamsthal Works	Vickers (England)	AA+AA	2	 7500 2150 3200 2150 969 12500 12500 12500 12500 kg.	4	Interpoles	Tramway suspension	1:4.06	920	50,000	50,000	Electropneumatic camshaft controller	11,400	30	50
	Breitfeld Daněk	Siemens & Co	AA+AA	2	 7900 2700 2500 2700 1100 14000 14000 14000 14000 kg.	4	Interpoles	Tramway suspension	1:4.42	736	54,000	54,000	Electropneumatic contactors	11,300	30	50
	Breitfeld Daněk	Křižik El. Co.	AA+AA Storage Battery	1	 440 volt 9000 2400 4200 2400 1045 16500 16500 16500 16500 kg	4	Interpoles, field shunting	Tramway suspension	18:78	260	66,000	66,000	Mechanical drum controller	12,200	12	40
		Křižik El. Co.	A+A	1	Two Axles Two Motors per Axle	4	Interpoles	Tramway suspension	1	460	32,000	32,000	Mechanical drum controller	7844	30	–

INVESTMENT AND TRAFFIC STATISTICS

The total investment in the electric street and interurban lines in Czechoslovakia is estimated to be about $50,000,000 and the passenger traffic amounts to about 325,000,000 passengers yearly. There are about 7,000 employees, 900 motor cars and 700 trail cars. One-man cars are used on six of the smaller lines. Ten railways use track brakes.

RAILWAY ELECTRIFICATION

All main line railways in Czechoslovakia are the property of the government and since 1924 all electrified lines receive energy from the general three-phase, 50-cycle power transmission system in the country. In consequence of this standard, the high-voltage direct-current system has been adopted, most of the lines so far being built for 1,500 volts.

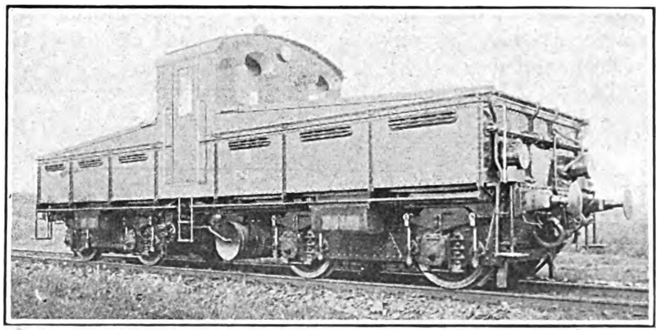
The most important electrification started is that at the Wilson terminal in Prague. This station is in the very heart of the city and with steam operation the emission of smoke from the locomotives was a great nuisance. In addition, the trains entering this station from the south had to pass through a long tunnel, so that the elimination of smoke-producing locomotives was very desirable.

The electrification of this new terminal was begun by the purchase of six storage battery locomotives to haul trains to and from the station through the tunnel and for a short distance beyond. One of these storage battery locomotives has been in regular service since May, 1926. It is the most powerful storage battery locomotive in Europe. It was built by the Krizik Electric Company and is illustrated in accompanying engravings. All principal data and details about it are given in the table. It operates from ten to twelve hours a day, hauling all important express and passenger trains in and out of the terminal and during this time uses only 300 kw.-hr. measured on the three-phase side of the motor charging set. It needs no boosting during its service time and is charged during three hours late at night. Its maximum energy consumption is 450 amp. at 450 volts.

There is one central cab for the locomotive engineer, who is the only operator required. A feature of the equipment is the drum controller with finger contacts which can be operated by either one of two hand wheels on a horizontal shaft, so that the driver can operate the controller from either side of the cab. Inside the control wheel is the handle of the starting switch for the electric pump of the vacuum brake. The main overload switch, the reversing switch, the battery changeover switch and the motor disconnecting switch are interlocked.

The battery equipment consists of 238 Tudor cells with an hourly rating of 392 amp.-hr. The four motors are 50 kw. each at 440 volts and 330 r.p.m. and have roller bearings, and motor braking is possible. The gear ratio is 1 to 5.118. The maximum motor efficiency, including gearing, is 88 per cent. The radius of action is 290 km. On a grade of 1.1 per cent and on a curve of 284 meters radius the locomotive has hauled a train of 400 metric tons at a speed of 5.5 km. per hour.

In the winter of 1925-26 sixteen electric locomotives for express, passenger, freight and switching service with overhead current distribution at 1,350-1,500 volts were ordered. Details about these locomotives are given in the accompanying table, together with those of the old Krizik locomotive from Vienna already mentioned, as this locomotive has now been adapted for Czechoslovakian service.


Storage Battery Locomotive in Terminal Service in Prague

Individual axle drive is used exclusively, the motor suspension being usually of the tramway type, one exception being the switching locomotive of the Skoda Works (No. 4 in the table) which has two twin motors with gearing, crank and a horizontal connecting rod.

Most of the locomotives are mounted on double trucks with all axles motor driven. An exception is the first given in the table, which is of the solid frame type with pilot wheels. The second locomotive given in the table also has pilot wheels, so that all of the passenger locomotives are so equipped, but it is planned in the future to do without them and to use type C + C or B + B + B for the larger units which are built for speeds up to 110 km. per hour.

The maximum output per driving axle for the locomotive with tramway type of suspension for the motors is 400 hp., but for the quill or Buchli method of connection the output is as high as 1,000 hp. per driving axle.

In connection with the list of manufacturers, it should be said that the Krizik Electric Company has business relations with the Brown-Boveri Works at Baden and for stationary machinery with the Bergmann Works at Berlin, the Cesko-Moravska-Kolben has connections with the Westinghouse Electric & Manufacturing Company and the Skoda Works with Schneider Creusot of France, the Adamsthal Works near Brünn is in collaboration with the English Vickers Company and Siemens & Company are in close relation with the Siemens-Schuckert Company of Vienna and Berlin. It should also be stated that the AEG-Union Electric Company, which co-operates with the Allgemeine Elektrizitäts Gesellschaft of Berlin and the General Electric Company of Schenectady, received an order for the line equipment of the Wilson terminus.

It will be noted that some of the engines have twin motors and some motors have a compensating winding to neutralize the armature cross field and reduce the voltage between commutator bars. The field is weakened not only by shunting the field winding through a resistance, but also by changing the field turns in circuit. All the motor ratings given in the table are for the lowest trolley voltage of 1,350. All of the motors in the locomotives are of the ventilated type. The cushion or elastic type of gear is used on some of the locomotives.

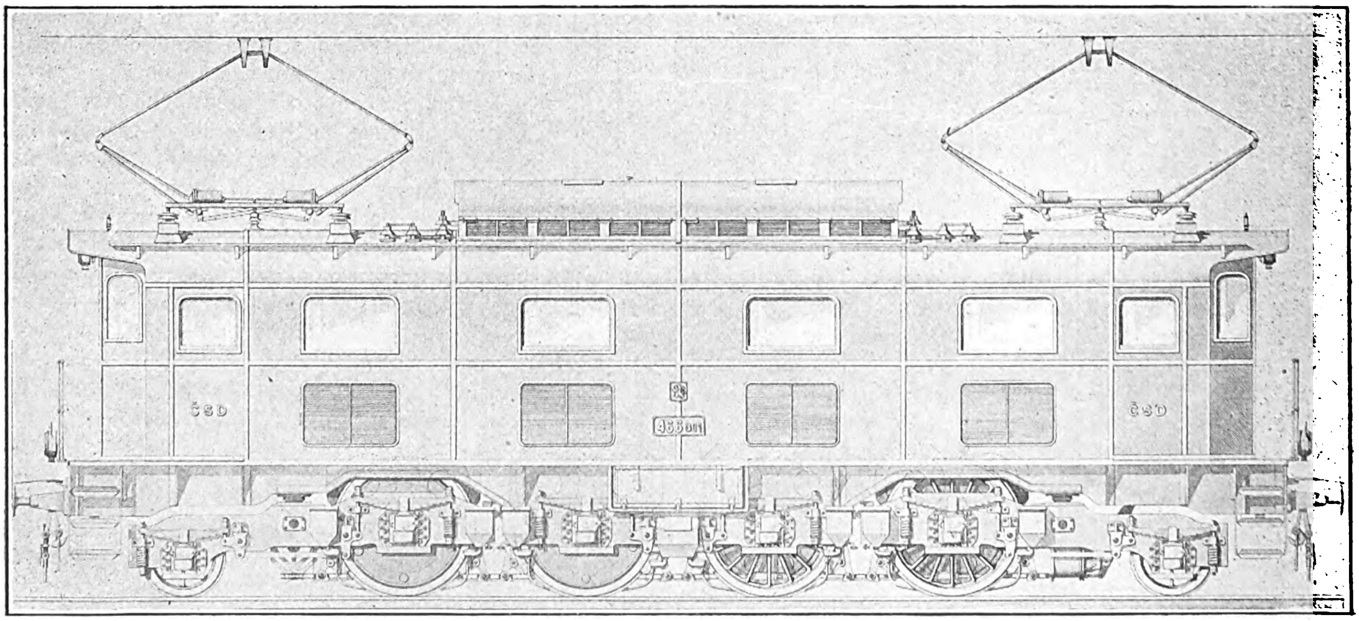
Contactor switches are employed on all the locomotives in connection with the control system but are not operated electromagnetically. They are equipped for operation either electropneumatically with single cylinders for each switch or by a camshaft, and this shaft is operated either electro-pneumatically or by an electric motor or by hand, as stated in one of the columns in the table.

LIGHT, HEAT AND BRAKE EQUIPMENT

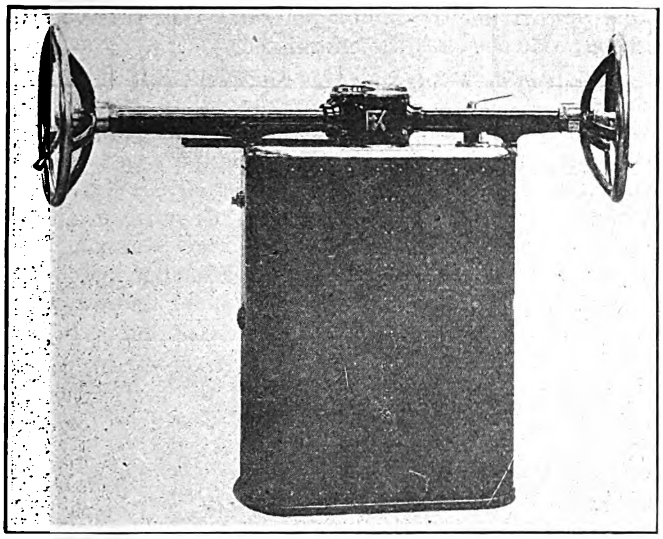
The light and control circuits are fed from a storage battery of two 24-volt units, but the heaters and all auxiliary motors for fans, compressors, etc., are supplied from the 1,500-volt trolley circuit. The cabs are heated electrically, but passenger cars are heated from a special steam boiler car. The whistle and sanders are operated pneumatically.

All locomotives are equipped with both air brakes and hand brakes, and the passenger and freight locomotives also have vacuum brakes. Every passenger and freight locomotive has two Westinghouse air operated pantograph collectors with two bows per collector. The contact pressure used is from 10 to 12 kg. (22 to 26 lb.).

Catenary overhead construction is used, and in some



One of the Passenger Electric Locomotives Being Built for the Prague Electrification. It Has Four Twin Type Motor Sets, one for Each Driving Axle



Controller for Storage Battery Locomotive

sections there are counterbalances to keep the trolley wire taut. The distance between the supporting poles is from 50 to 90 m. (165 to 275 ft.). Over each track there are two contact wires of 100 sq.mm. area (about 200,000 circ.mils). The messenger cable is just half the size and is of bronze in the tunnels and steel elsewhere. The rail bonds are soldered and welded.

POWER DISTRIBUTION

The single substation for the electrified zones in Prague is near the terminal and contains one double rotary of 2,000 kw. and one of 1,000 kw., built to supply two circuits of 750 volts in series. The rotaries have only shunt excitation, and a quick-acting circuit breaker is inserted in both direct-current lines. Future substations will be equipped with rotaries producing directly 1,500 volts in single machines and with mercury arc rectifiers. Power is received at the substation at 22,000 volts, three phase, from the local central station.

FUTURE PROGRAM

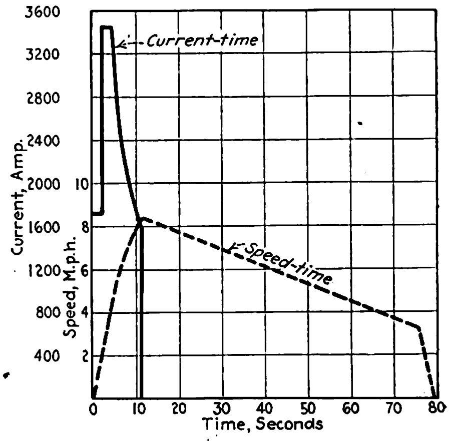
It is expected that complete electric service at the Wilson Station will begin in 1927. Later plans include the electrification of several suburban lines with motor cars, which will use the main line tracks for their suburban runs and the street railway tracks for city distribution in Prague. It is expected also to extend the trunk line electrification from Prague to Pilsen on the west and Trebova on the east.

Largest Storage Battery Locomotive Demonstrated

Before Many Witnesses the New 118-Ton Unit, Designed as an Intermediate Step in Electrification, Performs Switching Service in Competition with 127-Ton M-1 Steam Locomotive

WITNESSED by 100 representatives of railroads and manufacturers, the new storage-battery locomotive built for the Chicago & Northwestern Railway demonstrated in a satisfactory manner its ability to perform in competition with the M-1 type of steam switcher. The electric engine was designed to replace the M-1 type and several tests were made on Nov. 18 to demonstrate the relative operating characteristics of each.

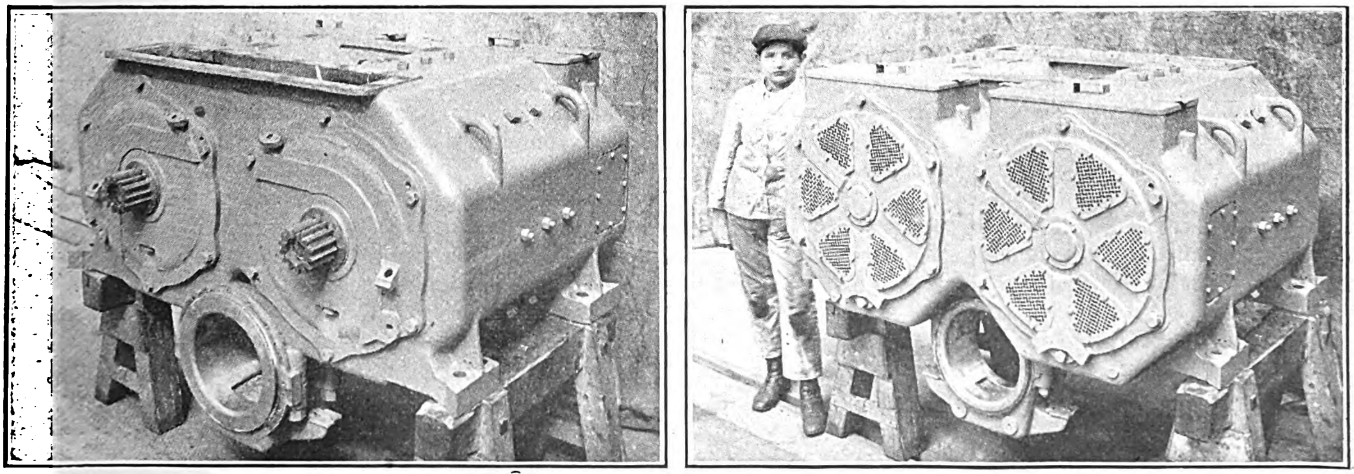
The first test was to determine the time required to move a given train 100 ft. from a standing start on a level tangent track with no slack in the train. The M-1 type of steam engine could not start the 1,700-ton test train assembled for this purpose without taking slack. The storage battery engine required 37.8 seconds to cover this distance under the conditions prescribed. Later the new unit demonstrated its ability to "kick off" fifteen cars, or 1,160 tons, over the hump and into the lead in 14.5 minutes. No comparative test of the steam engine was made.



Speed Time Curve for New Chicago & Northwestern Storage Battery Locomotive, Performing an Average Switching Movement as Determined by the Chicago Smoke Abatement Report. Trailing Train Weighs 306 Tons, Average Speed 5.4 M.P.H., Average Run 0.119 Mile, Per Cent of Time in Motion 60.1.

Of spectacular interest was the "tug of war" between the M-1 and the storage-battery engine, in which the latter won in both of the two trials made.

This new type of engine is dependent primarily on central station power for charging and hence was of direct interest to light and power officials. The tests



At Left Pinion End and at Right Commutator End of 425-Hp., 1,500-Volt Locomotive Twin Motor were run coincident with a meeting in Chicago of the electrification committee of the National Electric Light Association, of which Britton I. Budd is chairman. Mr. Budd and many other members of this committee were present.

In all, seventeen railroads were represented by one or more delegates, as well as several associations. Many individuals interested in electric transportation were present, including Dr. Herman Bundeson, commissioner of health city of Chicago, who is most interested in this step toward electrification from the smoke abatement standpoint. Representing the Chicago & Northwestern were H. T. Bentley, general superintendent; S. W. Hand, assistant to the president, and H. M. Eicholtz, assistant general manager.

Primarily, this type of locomotive is only a step toward full electrification. It is intended to perform switching service in big cities in which smoke, gases and noise have become a serious detriment to surrounding residences and business establishments. The present unit has a 200-hp. gasoline-electric "kicker" to give the battery a partial charge when the required full day's performance would exceed the battery charge. Under severe service the normal battery charge can be used up in a few hours, or under light switching service it will last sixteen hours. Normally the engine should be out of service eight hours a day for complete charging.

A second logical step toward electrification would be to erect a short stretch of trolley over the track most frequently used and by means of a pantograph and a high-speed motor-generator on the locomotive the battery could receive frequent short charges. The trolley would be permanently connected to a power source suitable for driving the motor-generator. In this way the gas-electric set could be eliminated.

The M-1 weighs 126.83 tons complete with 60 tons on drivers, while the electric weighs 118.5 tons with all weight on drivers. The electric is 52 ft. long over couplers, 10 ft. 3 in. wide over rail guards and 14 ft. 6½ in. high. Two trucks are used with four GE-287 motors wound to operate at 225 volts each. Gear ratio is 66/13 on 39-in. wheels. The locomotive was constructed by the General Electric Company at the Erie works and made the trip from Erie to Chicago under its own power. A stop was made at Cleveland, where the engine was placed on exhibit during the last A.E.R.A. convention.

10035
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Railroad Officials Watching the Largest Storage Battery Locomotive Start a 1,700-Ton Train Without Taking Slack and Move 100 Ft. in 37.8 Seconds. The M-1 Type Steam Switcher Which This New Unit Is Designed to Replace Could Not Start the Same Train. This Unit Is Now Performing Switching Service in Chicago for the Chicago & Northwestern Railway

Electric Storage Battery Company's type FL-31 Ironclad, 120-cell battery is used. It weighs approximately 78,960 lb. and has a 2,700-amp.-hour discharge capacity at the six-hour rate. The maximum discharge rate is 6,500 amp.

The locomotive will haul a 2,000-ton train, including the locomotive, on level tangent track at a maximum speed of 12.7 m.p.h. and will haul this train 15.8 miles on one complete discharge of the battery.

When hauling a 333-ton train (total weight) at 20 m.p.h. the cost of energy per mile, using the battery alone, is 7.5 cents, assuming an "off-peak" charging schedule of 1 cent per kilowatt-hour.

The smoke abatement report of Chicago shows that the average switching duty for the engines in all Chicago yards requires a speed of 5.4 m.p.h., a total distance traveled per eight-hour day of 26 miles, requiring a coal consumption of 0.37 tons per hour. The average weight of switching train is 425 tons and the average length of run 628 ft. It is for this service that the storage-battery locomotive was designed.

Increased Demand for Automotive Service Equipment

Purchases in 1926 Were the Largest of Any Year of Record—Many Trucks for Miscellaneous Haulage Purposes Were Ordered

FLEXIBILITY of automotive service equipment is proving popular with electric railways. Automotive vehicles are replacing many of the electric cars previously used for carrying material from place to place. It has a particular advantage in that it can reach distant points by direct route, and does not have to follow the track. For wreckage purposes, its flexibility enables it to reach the point of trouble quickly and without waiting for the clearing of long lines of stalled electric cars.

In an accompanying table the automotive service equipment which was ordered by electric railways during the year 1926 is listed. An interesting feature of these figures is the large number of automotive trucks purchased for miscellaneous uses such as for removal of snow and transportation of freight and express. Many railways are finding these trucks of particular convenience in following up electrically equipped sweepers and snow plows which clean the track area. By the use of automotive equipment areas adjacent to the track are cleared quickly and congestion of traffic on the tracks is prevented. A number of railways also have contracts with city governments for the removal of snow adjacent to the car tracks and for this work the automotive equipment is found of particular value.

A general summary of the various types of equipment which are shown in the table, together with the comparisons of equipment ordered in previous years, appeared in the Jan. 1 issue of this paper. Lack of space prevented the publication of this table in that issue. The list includes 52 railway companies which ordered a total of 347 automotive service vehicles during the year just ended. This is an increase of approximately 25 per cent over purchases made in the preceding year.

Automotive Service Equipment Ordered by Railways During 1926

Name of Railway	No.	Type	Capacity, Tons	Make
Connecticut				
Connecticut Co.	2	Frt. & Exp. Truck	1½	Reo
	1	Frt. & Exp. Truck	3½	White
	2	Service Truck	2½	Mack
	1	Tower Truck	2½	White
	1	Dump Truck	1½	Ford
	1	Snow Plow	1	Reo Signal
	1	Snow Plow	1½	Reo Tower
	2	Snow Plow	½	Ford Service
	3	Snow Plow	....	Good Roads Mach.
Massachusetts				
Boston Elevated Ry.	77	Truck and Tractor	....	....
	18	Truck and Tractor	....	....
Eastern Mass. St. Ry.	7	Tractor	5	....
Middlesex & Boston St. Ry.	1	Truck	1	Graham
Union Street Ry.	1	Tower Truck	2½	Auto Car-U. S. Ry.
Worcester Cons. St. Ry.	1	Truck	1	Federal
Maryland				
Cumberland & Westernport Electric Ry.	1	Frt. & Exp. Truck	3½	White
New Jersey				
Morris County Traction Co.	1	Snow Plow	....	Walter
New York				
Brooklyn City R.R.	21	Various	¾-5	White & Ford
Brooklyn-Manhattan Transit Corp.	20	Truck	Var.	G. M. C.
Buffalo & Erie Ry.	4	Frt. & Exp. Truck	14½	White-Niagara
	6	Trailers	....	....
Newburgh Pub. Serv. Corp.	1	....	5	....
New York State Rys. (Rochester)	1	Express Truck	1½	Graham-N.Y.S. Rys.
	1	Line Truck	1	Reo-N.Y.S. Rys.
	1	Service Car	1	Studebaker-N.Y.S. Rys.
	1	Money Wagon	1	Brockway-N.Y.S. Rys.
N. Y. State Rys. (Syracuse)	1	Express Truck	3½	Sanford-N.Y.S. Rys.
	1	Tractor	5	G. M. C.
	2	Trailers	2½	Wolverine
	1	Service Truck	1	Reo-N.Y.S. Rys.
N. Y. State Rys. (Utica)	2	Express Truck	5	White-N.Y.S. Rys.
	1	Express Truck	1½	Brockway-N.Y.S. Rys.
	1	Express Truck	1½	G.M.C.-N.Y.S. Rys.
	1	Service Car	1	Reo N.Y.S. Rys.
Richmond Light & R.R. Co.	1	Tower Truck	....	Auto Truck
Third Avenue Ry.	1	Truck	....	Reo
United Traction Co.	2	Tank Trucks	2½	Mack-Sharpsville
	2	Snow Plows	5	Walter
	1	Service Truck	1	Ford
Pennsylvania				
Altoona & Logan Valley Electric Ry.	1	Truck	2½	Mack
Erie Rys.	2	Dump Trucks	1½	....
Lewistown & Reedsville Electric Ry.	1	Truck	2½	Yellow
Philadelphia & West Chester Traction Co.	1	Service Truck	¾	Dodge
	1	Snow Plow	7	Walter
West Penn Rys.	1	Tower Truck	2½	White
Illinois				
Aurora, Elgin & Fox River Electric Co.	1	Truck	1	Reo
Chicago & Joliet Elec. Ry.	2	Truck	2½	Garford
Chicago, North Shore & Milwaukee R.R.	22	Trailers	8	Mobile-Cincinnati
Chicago Rapid Transit Co.	1	Truck	¾	Ford
Chicago Surface Lines	1	Frt. & Exp. Truck	....	Ford-DeKalbe
	2	Frt. & Exp. Truck	3½	White-Wayman & Murphy
	6	Service Trucks	3½	White-C.S.L.
	1	Service Truck	2½	Mack-Press Sons
	1	Service Truck	3	Auto Car
Indiana				
So. Indiana Gas & Elec. Co.	1	Service Truck	1	Graham
Iowa				
Sioux City Service Co.	1	Truck	1	Ford
Kentucky				
Louisville Ry.	3	Service Truck	3	Ford
	1	Service Truck	1½	Graham
Michigan				
Dept. of St. Rys., Detroit	5	Service Truck	....	Ford
	1	Truck	....	Cummings
	6	Truck	....	Walter
Minnesota				
Twin City Rapid Trans. Co.	2	Truck	1	Ford
Missouri				
United Rys. of St. Louis	2	Tractors	....	Fordson
	1	Truck	1	Ford
	1	Truck	2	White
	2	Tower Truck	2½	White-U.R.
Ohio				
Community Traction Co.	1	Tower Truck	1	Inter.-McArdle
Pennsylvania-Ohio El. Co.	1	Truck	2½	White
	1	Truck	2½	Mack
Toledo, Bowling Green & Southern Traction Co.	2	Truck	1	Ford
Alabama				
Birmingham Electric Co.	3	Truck	5½	White-B.E. Co.
	1	Truck	5½	Ford
Florida				
Miami Beach Ry.	1	Truck	¾	Graham
Georgia				
Macon Ry. & Light Co.	1	Tower Truck	2	White-McCardle
California				
Key System Transit Co.	18	Trucks	....	Various Kinds
Market Street Ry.	1	Frt. & Exp. Truck	3½	Fageol
Municipal Ry. of San Francisco	1	Dump Truck	5	White
Pacific Electric Ry.	1	Service Truck	1	Graham
Nebraska				
Omaha & Council Bluffs Street Ry.	1	Truck	1	Ford
Texas				
Dallas Ry. & Terminal Co.	1	Truck	....	Chevrolet
	1	Truck	....	Ford
El Paso Electric Co.	1	Truck	1	Ford-E. P. E. Co.
Washington				
Puget Sound Pwr. & Lt. Co.	2	Truck	1	Graham
	1	Truck	1½	G.M.C.-P.S.P. & L. Co
	1	Truck	1½	Garford-P.S.P. & L. Co
Seattle Municipal Ry.	1	Money Truck	1	Graham
Canada				
British Columbia Elec. Co.	2	Frt. & Exp. Truck	3	Federal-B. C. E. Co.
	3	Frt. & Exp. Truck	2	Federal-B.C.E. Co.
	2	Frt. & Exp. Trailer	4	Dominion-B.C.E. Co.
	3	Truck	2	Federal-B.C.E. Co.
	6	Service Car	¾	Ford-B.C.E. Co.
Hydro Electric Rys.	1	Truck	....	Ford
Montreal Tramways	6	Dump Truck	1	Ford-Hughes Keenan
	2	Express Truck	2½	Federal
	1	Express Truck	3	Leyland
	1	Tower Truck	2½	Federal
Toronto Transp. Com.	15	Truck	....	Ford
Total	347			

The Readers' Forum

Traffic Congestion Editorial Approved

NEW YORK, N. Y., Dec. 24, 1926.

To the Editor:

I wish to compliment the writer of the editorial on page 1079 of the Dec. 18 issue of ELECTRIC RAILWAY JOURNAL on the subject of "Traffic Congestion in New York City."

I should like to see some set-up effected by interested parties whereby this character of information would get a wider circulation and be placed in the hands of the riding public.

T. R. LANGAN,
President Metropolitan Section A.E.R.A.

Foreman Conferences Can Help

BOSTON ELEVATED RAILWAY

BOSTON, Jan. 1, 1927.

To the Editor:

The editorials on educational activities in the steam and electric railway fields which appeared in recent issues of the ELECTRIC RAILWAY JOURNAL are timely and sound in their reasoning. Our experience has shown that men in supervisory positions; that is, foremen in a broad sense, are eager to discuss the principles of foremanship, and their interest increases after they see the possibilities of such discussion. Your statement regarding the continued enthusiasm of foremen in the steam-railroad field could be duplicated with respect to our own field and that of manufacturing.

It is probable that the average foreman has never had an opportunity to think of his duties in a broad way. He has come up from the ranks and presumably has been a skilled workman, using that term to cover all kinds of electric railway work. He has had difficulty in detaching himself from the point of view of the workman. When he has pointed out to him the possibilities of his supervisory work in seeing that what is supposed to be done is done right, in considering the element of cost, in insuring that each job under him is being done in the best possible way, in looking out for the welfare of his working force, in co-operating with the working force, his fellow foremen and the management, etc., he is amazed, delighted and stimulated to make the most of his opportunities. This explains, to my mind, the widespread interest in foreman conferences, and it is to be deplored that more executives do not appreciate the fallow field which lies right at their door.

You touch upon the subject of apprenticeship, which is more difficult to deal with. The old-fashioned apprenticeship system has largely died out and there is nothing yet to take its place. The manufacturing industries are possibly getting hold of this situation, but not on the old basis. The steam railroads seem to be making some progress too. The subject is one which ought to be discussed freely in our industry. I hope that your correspondents will take it up. In the meantime, little discussion is needed on foreman conference plans. The foremen everywhere will welcome these conferences. All that is needed is for some one on each property to give the matter careful study. The American Electric Railway Association committee on education, under the leadership of Edward Dana, through its series of "How-to-do-it" booklets has made its recommendations very definite. The demonstrations under the auspices of the committee, which you indorsed in your editorials, have shown how uniformly foremen from different properties, previously unacquainted with each other and with the foreman conference plan, react to these conferences.

H. H. NORRIS,
Educational Adviser.

Long Electric Trains Not Unusual

NEW YORK, NEW HAVEN & HARTFORD RAILROAD

NEW HAVEN, CONN., Dec. 11, 1926.

To the Editor:

I noted with interest your account as published on page 568 of the JOURNAL for Oct. 2 of the test of the New York Central locomotive between Harmon and New York City, in which it was stated that the train of 108 freight cars was "the longest ever seen in New York City." I beg leave to call to your attention the fact that on the New Haven Railroad there are freight trains (electrically operated) relatively frequently of more than 100 cars and in numerous instances of more than 108 cars, these trains being hauled along the Harlem River branch to the Harlem River or Oak Point terminals.

SIDNEY WITHINGTON,
Electrical Engineer.

Buses Extend and Augment Rail Lines

THIS advertisement of the Pennsylvania Coach Lines in recent issues of the *Official Cleveland Guide* shows not only the progressive leadership of this subsidiary of the Pennsylvania Ohio Electric Company but the wide extent of the service supplied. A few years ago the parent company operated only rail service to Youngstown and Warren, Sharon, Newcastle and intermediate points, with connections as shown.

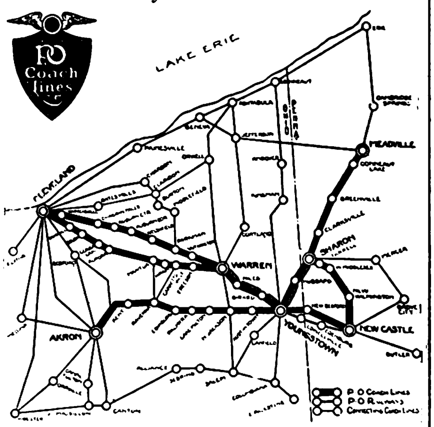
Travel Service DeLuxe

To Warren, Youngstown,
New Castle and Sharon

By The

P. O. COACH LINES

—Every Hour on the Hour—



Coaches Leave Union Bus Terminal

2133 E. 9th St. Phone Sup. 2450

Limiteds	*Locals*
7:00, 9:00, 11:00 A. M. 1:00, 3:00, 5:00 P. M.	6:00 A. M. Hourly to 5:00 P. M., 7:00 P. M., 9:00 P. M.

11:15 P. M. COACH SAT., SUN., HOLIDAYS

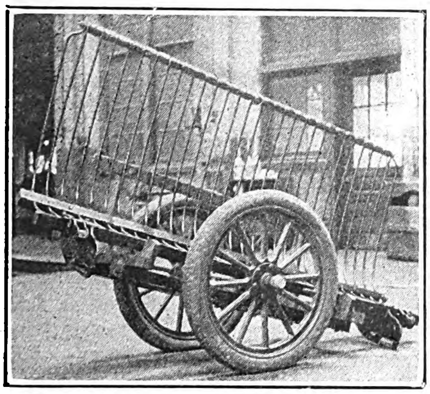
THE EARLY BIRD SPECIAL

Particularly for Traveling Men
Leaves Cleveland at 6 A. M.

Maintenance Notes

Pneumatic-Tired Truck for Moving Fenders

HANDLING and transporting fenders in and about the shop of the York Railways, York, Pa., was always a troublesome and expensive job until E. L. Greene, master mechanic, designed and constructed a pneumatic-tired hand truck to facilitate this work. This truck has a pair of Ford automobile wheels mounted on an axle to which is attached a 6-ft. by 3-ft. underslung rectangular oak frame of rugged construction. This is fitted with suitable saddles and rests to permit the safe, steady carrying of fenders in a vertical position.



Fender Loaded on Pneumatic-Tired Truck Ready for Transportation

Fenders are very unwieldy pieces of apparatus to handle and to transport them to and from various sections of the shop formerly required the services of two men and was necessarily rather slow. Since this truck has been placed in service one man has been able to load and transport fenders around the shop. This results in a reduction in fender labor maintenance and a tremendous increase in shop transportation speed.

Location of the Jumper Fuse

WHEN a piece of apparatus driven by an electric motor is used out on the line the power is generally taken from the trolley wire through a wire jumper with a hook on its end. The hook is attached to the end of a pole and is long enough to permit of being hooked over the trolley wire, or, better still, over an ear, because of the lessened liability of the wire being damaged by an arc.

The usual place for the fuse in such a circuit is at the motor, the idea being to protect the machinery. However, on the lines of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., after having had the trolley wire burned down on several occasions due to the insulation of the jumper wire becoming worn off and the wire grounding on the track, a fuse has been installed in the wire on the pole, where it is so close to the trolley wire that there is no chance for a ground occurring inside of its protection. This location is most satisfactory.

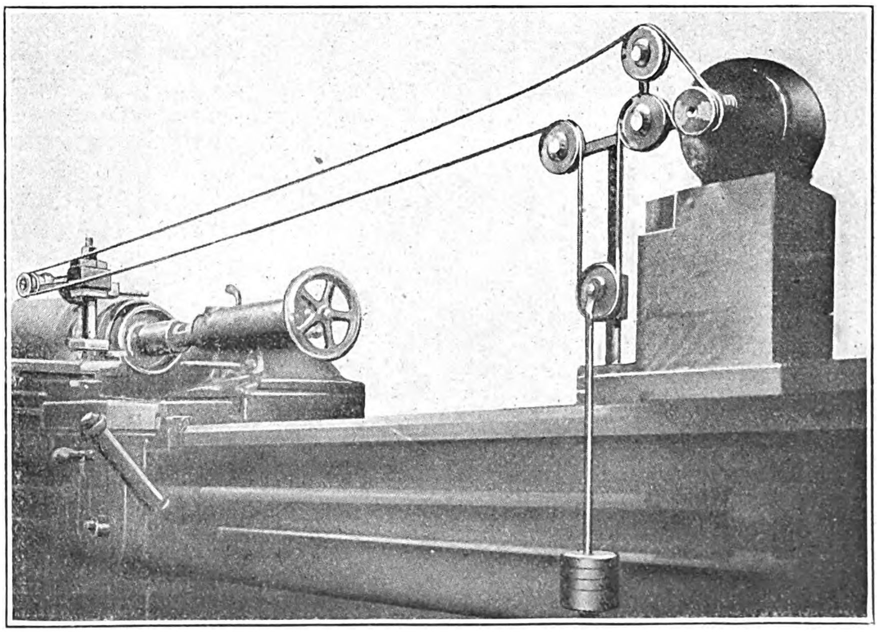
Railway operator's "three R's"—Requisition, Reliable, Renewals.

Commutator Slotter on Lathe Tool Stand

FULLY appreciating the value of commutator slotting, and not being financially able to purchase a manufacturer's product, the Williamsport Passenger Railway, Williamsport, Pa., designed and built a slotting device in its shop. The equipment is designed to be used in connection with a lathe. It is of the semi-portable type, since the slotter proper can be set up readily on the lathe tool stand or removed at will. The motor, with a group of pulleys, is installed on a wood pedestal and is clamped and mounted permanently on the extreme right-hand end of the lathe rails.

A 1-in. steel tube is fastened to a steel plate on one end and to the saw shaft bearing casting on the other. Passing through tube, steel plate and bearing casting is a ¾-in. bolt used for fastening the machine to the tool stand. The saw shaft passes through suitable bearings. On its end is a 3-in. grooved pulley.

A ¼-hp., 110-volt universal motor drives the slotting machine by means of a ⅜-in. round belt guided and supported by 3-in. grooved pulleys, all of which are stationary except the counterweight wheel. The depth of the slot is controlled by the diameter of the saw being used, whereas the lateral motion is ob-



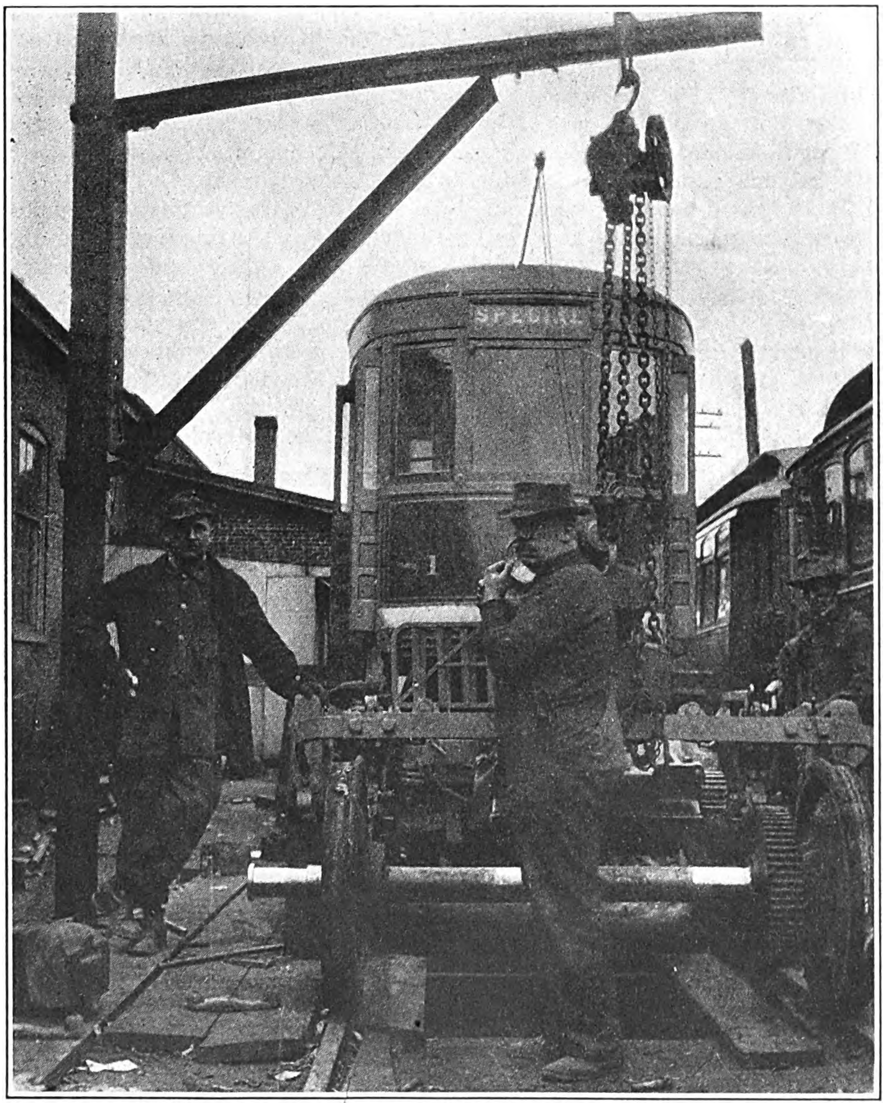
Slotting Equipment Installed in Position and Ready for Use tained by means of tool stand movement. The lengthening or shortening of the belt due to the tool stand travel is taken up by means of a counterweight attached to a 3-in. grooved pulley suspended over the lower part of the belt, held in place and guided in its oscillating vertical movement by a 1-in. T-iron bracket fastened to the motor foundation block. The other pulleys are rigidly supported and act as directional belt deflectors. This equipment has been giving satisfactory service for about two years.

> *"Keep up" with your schedules by systematic equipment "up keep."*

Derrick for Lifting Motors and Trucks

NECESSITY, as the mother of invention, has been very clearly demonstrated by the shop organization of the Valley Railways, Lemoyne, Pa. Due to limited shop space and track facilities, it was found impracticable to take care of painting, damaged car repairs and motor or truck overhauling at the same time. This interfered greatly with the usual maintenance procedures. Lifting facilities in the shop often were obstructed by work in progress. In order to reduce such interruptions a derrick was erected outside the shop building on an adjacent track. This derrick consists of an 8-in. iron pipe mast inserted in a concrete foundation, and a boom made of 65-lb. T-rail, reinforced by a T-rail diagonal brace and a 1-in. x 4-in. vertical brace of steel strap, all being bolted together rigidly. The upper end of the boom framing is provided with a guide ring and the lower end with a thrust ring, thus permitting a free circular movement and providing a substantial construction for the carrying of the load.

The thrust ring rests and revolves upon a heavy circular band welded to the mast, which when lubricated, enables the operator to change its position without any great physical effort. Lifting is accomplished by means of a chain hoist suspended from a strong movable link attached to the boom. This derrick has proved very satisfactory and has been a means of obtaining a non-interrupted motor and truck overhauling schedule.



Truck Frame Suspended on Outdoor Derrick Chain Hoist

Pick-Up and Delivery Service for Storeroom

PICK-UP and delivery service is given by the storeroom in the South Park shop of the Los Angeles Railway to all departments included in the shop area. This system replaces the former method of delivering goods on requisition and has resulted in saving a substantial amount of money. Instead of 200 shop men per day calling at the storeroom for materials needed, four delivery clerks make regular calls on the several departments of the shop five times per day. They collect requisitions for material from pick-up boxes and make delivery of material to the proper departments. In some cases one department will requisition material to be delivered to another department for use by its men while doing special work there.

Requisitions are made out in duplicate, the original being given to the storeroom boy and the carbon retained by the department foreman for allocation of charges on the job. When the errand boy is making delivery, which often requires the use of a truck or cart, he collects salvage and scrap materials, which are returned to the storeroom for reclaiming or other disposal.

This system has eliminated the long line of men waiting 20 to 30 minutes at the storeroom counter for service. With 200 men calling at the storeroom, this amounted to a considerable loss in labor time. It has been calculated that the new system has resulted in a saving of $15,000 a year.

Besides the saving in productive time, the entire department is speeded up because the materials needed are constantly available.

During the month of November 5,088 deliveries were made at an average of 4¾ minutes per delivery.

When material is delivered, the original requisition, which is returned with it, is signed by the foreman. It is returned and placed in a box in the storeroom as a receipt for the delivery, also serving to check material on hand in the stockroom and indicating the department to which general charge can be made. The foreman makes the detailed distribution of charges on his copy of the requisition.

Cover hints for ventilated motors—Porous knits or B.V.D.'s for summer, and red flannels when the snow flies.

New Equipment Available

Electric Tie Tamper Has Only One Moving Part

By an unusual application of magnets energized by alternating current, an electric tie tamper recently put on the market by the Syntron Company, Pittsburgh, Pa., is able to strike 1,200 blows per minute. It is claimed that this apparatus quadruples the amount of tamping that a track laborer can do in a day. During a test made by the Monongahela Railroad a 198-ft. section of track was electrically tamped in seven man-hours, while it required 26¼ hours to tamp a section of the same length by hand. The cost of electric tamping was 1.5 cents per foot of track, as compared with 5.3 cents per foot for hand tamping. Detailed figures for this and another similar test are given in an accompanying table.

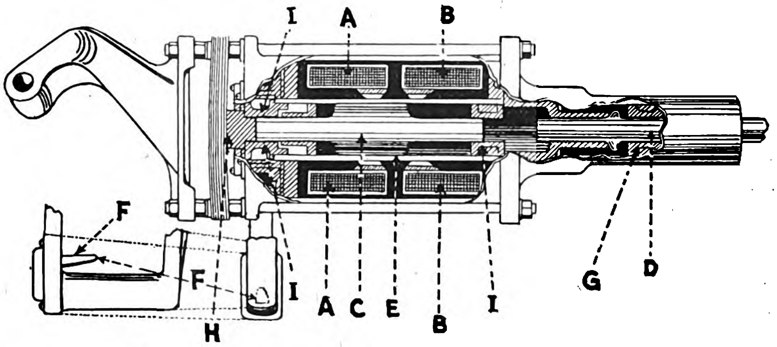
The Syntron electric tie tamper has only one moving part—the piston. Four powerful electromagnets are located in a cylindrical housing around the upper end of the piston. Energizing the magnets by alternating current gives the piston a reciprocating motion in synchronism with the supply voltage.

The tamping tool is held by a bushing so that it receives the full force of the blow as the piston reaches its maximum speed. On the backward stroke the piston impacts against a shock-absorbing device which takes up the kinetic energy of the movement and utilizes it to add force to the downward stroke. An accompanying sketch shows the arrangement of the various parts of the apparatus. The total weight is 56 lb.

Starting and stopping of the hammer is controlled by a trigger on the side of the handle. Current supply to the tamper is regulated through a small portable control box.

The alternating current required for operation of the apparatus is derived from a portable power plant consisting of a four-cylinder, 15-hp. Le Roi water-cooled gasoline engine direct connected to a 6-kva., 110-volt generator. Energy for the simultaneous operation of four tampers is supplied. The power plant weighs only 750 lb. and can be moved easily from place to place either by carrying or on dolly wheels.

Chief among the advantages claimed for this outfit are the rugged character of the tamper because it has only one moving part and the portability of the power plant because of its light weight.



Simplicity Is a Feature of the Syntron Electric Tie Tamper

A and *B*—Magnets.
C—Steel piston.
D—Tamping tool.
E—Cylindrical housing.
F—Control trigger.
G—Bushing.
H—Shock absorber.
I—Bushing.

The Power Plant of the Syntron Electric Tie Tamper Weighs so Little that It Can Be Carried by Hand from Place to Place. A Battery of Four Electric Tampers at Work

TEST OF ELECTRIC TAMPING VERSUS HAND TAMPING CONDUCTED ON MONONGAHELA RAILROAD AT POINT MARION, PA.

	Rails	Ties	Feet	Lift, Inches	Men	Hours Work	Hours Tamp	Total Hours Tamp	Total Cost Tamp	Gas and Oil	Total Opp. Cost	Cost Per Rail	Cost Per Tie	Cost Per Foot	Cost Per Mile
June 30, 1926															
Hand tamp	..	56	95	2	8	9	1¾	14	$5.60	....	$5.60	....	$0.10	$0.059	$311.52
Syntron tamp	..	95	175	2	6	9	1¾	10½	4.20	0.25	4.45	....	0.046	0.025	132.00
July 2, 1926															
Hand tamp	6	120	198	2	15	1¾	1¾	26¼	$10.50	....	$10.50	$1.75	$0.08¾	$0.053	$279.40
Syntron tamp	6	120	198	2	6	1⅙	1⅙	7	2.80	0.20	3.00	0.50	0.02⅓	0.015	79.20

Association News and Discussions

Midwestern Association Meets in Tulsa

MODERNIZATION of the interurban railway, public relations, improvement of transportation and the advantages of new equipment occupied the first day of the two-day session of the Midwest Electric Railway Association which was in session as this issue of the JOURNAL went to press.

After a cordial welcome to the city by Mayor H. F. Newblock of Tulsa, J. M. Bosenbury discussed in detail the methods by which the Illinois Traction System had succeeded in stopping a downward curve of passenger earnings and in building up a substantial increase in freight revenue. To improved equipment, increased speed and intense merchandising effort on the part of both the management and employees of the company was attributed the success accomplished.

The subject of public relations was handled from the angle of the public's own viewpoint by E. F. McKay, manager Oklahoma Utilities Association. Demonstrated sincerity of purpose was held by Mr. McKay to be the first principle in the establishment of a sound public relations policy. The speaker characterized the sense of his thought by pointing out that the establishment of good public relations, like good statesmanship, is dependent on successful diplomacy and that good diplomacy is merely good faith.

M. W. Welsh, manager Waterloo, Cedar Falls & Northern Railroad, representing the Iowa Electric Railway Association, addressed the meeting on the invitation of President Reynolds. He described the tendency of recent years for electric railways to adopt a defensive attitude instead of one of positive aggression. He maintained that the railways had not been given fair consideration, in some cases by their own managements, in comparing their performance with that of buses. "People like success," said Mr. Welsh, "and it is up to all of us to drop our tendency to whine about our troubles and concentrate on so improving our service as to win public interest and support."

In a paper which was declared by several of those in attendance to be one of the best ever delivered before a sectional association meeting R. N. Graham, manager railways Penn-Ohio Electric Company, Youngstown, Ohio, outlined the principles on which his company had so improved its condition as to win the Coffin Award for 1926. Mr. Graham's paper will be published in next week's issue.

A general survey of the industry, indicating that the railways of the country are expending in excess operating costs for obsolete equipment a sum sufficient to purchase 12,000 new cars per year at $15,000 each, was the basis for an address by Charles Gordon, indicating that the industry cannot afford longer to continue the operation of heavy and out-of-date cars. A further report of the meeting will be published next week.

Important Tentative American Standards Completed

WORK of the sectional committee of the American Engineering Standards Committee on tooth form of spur gears, which has been in progress for several years, has been completed and has been submitted for the formal approval of the A.E.S.C. as a tentative American standard. Several parts of the comprehensive work on bolt, nut and rivet proportions are now nearly completed, and the same is true of several sections of the work on pipe flanges and fittings. It is expected that the first of these to be issued will be that on high-pressure steel flanges, which, although not yet officially completed, is already practically the sole basis of industrial practice in recent advances in high-pressure steam practice.

The work on mechanical standards now in the course of development under A.E.S.C. procedure is so extensive that plans are under way for the organization of a representative advisory committee to keep the various parts of the work properly co-ordinated.

During the year 1926 specifications satisfactory to both the steam railways and electric railways have been agreed upon for the first time. It is an interesting illustration of the manifold inter-relationships of modern industry that eleven national organizations were officially represented on the sectional committee through which this unification of specifications has been accomplished. Specifications for tubular steel poles and for girder rails have also been unified and approved as tentative American standards.

Twenty of the 50 codes on the national safety code program have now been approved by the A.E.S.C. Among those receiving approval during 1926 were a group of codes for the prevention of dust explosions and new editions of the codes for abrasive wheels and punch presses.

A particularly important development has been the revision of the "National Electrical Code," which is the industry's bible for wiring devices. This included a settlement, by almost unanimous action, of a controversy of three years standing over the admission as approved material of non-metallic sheathed cable. This new material was approved for limited uses.

In connection with the safety code program, and upon the initiative of the state industrial commissions, arrangements have been made for a revision of the standard plan of reporting and compiling accident statistics under the procedure of the American Engineering Standards Committee. This plan forms the general basis of the accident statistics of the various state governments and of the casualty insurance companies.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 10-11—National Automobile Chamber of Commerce, third world motor transport congress, Hotel Roosevelt, New York City.

Jan. 10-14—American Road Builders' Association, convention and road show, Coliseum, Chicago, Ill.

Jan. 18 — American Society of Safety Engineers, annual meeting, Cafe Boulevard, New York City, 6:30 p.m.

Jan. 19-20—Central Electric Traffic Association, Fort Wayne, Ind.

Jan. 21-22—Central Electric Railway Accountants' Association, Fort Wayne, Ind.

Jan. 25—New York Electric Railway Association, winter meeting. Hotel Commodore, New York City.

Jan. _26-28_—Association of Equipment Men — Southern Properties, Peabody Hotel, Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

Third World Motor Congress

NATIONAL Automobile Chamber of Commerce will hold its third world motor congress Jan. 10 and 11 at the Hotel Roosevelt, New York City. Discussions of international development of motor transport, highways, trade practices, public relations and automotive finance will fill the major part of the program. Delegates will visit the National Automobile Show at the Grand Central Palace, Jan. 12, and will then go to Detroit and other Western cities to inspect factories of the industry.

The News of the Industry

Further Economies by Seattle Municipal Line

Economies which were to be put into effect on Jan. 3, including rerouting of cars, were expected to cut 40 men from the payroll of the Seattle Municipal Railway, Seattle, Wash., and reduce operating expenses an additional $146,420 annually. D. W. Henderson, superintendent, so declared in a statement to Mayor Bertha K. Landes. The rerouting is part of the proposed economy program of the railway. It will decrease the week-day car-hours 308 hours and twelve minutes a day and the Sunday car-hours 404 hours and 45 minutes. This, Mr. Henderson says, will result in a saving of $146,420 a year in platform time.

Meantime, the City Council has voted, eight to one, to repeal the ordinance enacted recently when the Seattle Clearing House Association refused to cash December payroll warrants of the railway, which provided for an increase from 2 to 2½ per cent interest on city funds. The banks refused to permit the advance and have refused city money at the new rate. The city's contracts with the banks expired on Dec. 31 and it was necessary to repeal the ordinance so that the city would not be faced with more than $5,000,000 of money on hand and no place to bank it.

Street railway employees, through their union leaders, have informed Mayor Bertha K. Landes that they will fight any attempt by the city to lay off street railway employees on the efficiency rating basis. They declare that if lay-offs be made, they must be according to seniority. The city charter provides that lay-offs be based on the efficiency rating schedules, which the union men state violates the union principle that men employed the shortest time be the first to be discharged.

Meantime, Mayor Landes will begin a series of conferences immediately after Jan. 1 with officials of the Puget Sound Power & Light Company in an effort to extend the time for payment of the Municipal Street Railway debt. In the opinion of city officials, one of the most pressing of the department's financial problems will be ironed out if an extended payment plan can be put into effect.

Final Hearing on Utica and Syracuse Fares

Chairman Prendergast held the final hearing in Albany on Jan. 5 on the petition of the New York State Railways to the Public Service Commission for permission to increase railway fares on its Syracuse lines.

Evidence was submitted by Charles Hansel as to reproduction cost and value of the property of the railway. Mr. Bean, the chief engineer of the company, and B. E. Tilton, vice-president and general manager of the Utica and Syracuse lines, were cross-examined by the attorney for the city. Mr. Tilton presented statements showing the result of operations on the Utica lines from Aug. 22 to Dec. 31 in the years 1925 and 1926, giving a comparison of the earnings in these two years, the effect of increased fares and the use of commutation tickets. He stated that the averages show that 27 per cent of the passengers are paying cash fares and 73 per cent buying tickets.

The engineers of the commission were cross-examined as to such inspections and their valuation of the property and equipment of the railway.

H. Duance Bruce, assistant corporation counsel, and Milo R. Maltbie, former Public Service Commissioner, represented the city of Syracuse. Willis H. Mitchell and W. G. Gannon of Gannon, Spencer, Mitchell & Riley, attorneys, represented the railway.

Counsel were given two weeks in which to file briefs. Mr. Prendergast stated that he would like to have the decision expedited as much as possible.

Inquiry Into Proposed Fare Changes in Newark

Proposed changes in eleven fare zones in northern New Jersey which the Public Service Railway and the Public Service Transportation Company, Newark, N. J., sought to make effective on Jan. 1 were suspended on Dec. 24 by the Board of Public Utility Commissioners of New Jersey for three months pending the outcome of a hearing called for Jan. 19 at Newark to inquire into the new schedule. The proposed readjustment was referred to at length in the ELECTRIC RAILWAY JOURNAL for Dec. 18, page 1111.

A Close Shave for Memphis

NOT a male member of the staff of the Memphis Street Railway, Memphis, Tenn., was overlooked in the distribution at Christmas of neatly bound holly boxes each containing a safety razor with strop. A total of 850 gifts was made to the company by A. D. McWhorter, general superintendent. An order for the razors was placed some weeks ago, and the plush lined boxes in which the razors were contained bore a special message with the imprint "Compliments of the Memphis Street Railway." Even President T. H. Tutwiler is expected to shave himself during the new year. The annual practice of distributing suitable presents to the employees' children was continued.

Downtown Dips Disapproved for Detroit

The Rapid Transit Commission of Detroit, Mich., in a report made public on Dec. 30, states that it believes the city is ready and can finance a complete rapid transit system, and that, in its opinion, construction of the "dips" would be "unwise and would set a bad precedent for the financing and construction of the remainder of the system."

Rather than build subway dips in the downtown section, the commission believes it advisable to begin subway construction on a smaller scale than that recommended in its original report, which embraced a complete unified system to all four sections of the city. It recommends that construction be started on the lesser scale only in event that the plan outlined is not put to the voters "on account of political, psychological or other reasons."

In the event that the city does not accept the plan recommended by the commission then that body recommended several alternatives, fifth among which is the subway dip plan suggested by Mayor Smith. This plan would entail construction of those portions of the Woodward, Grand River and Gratiot lines operating through the mile circle, in which the downtown section is located. Subway dips would compel the city to alter the financing plan already approved by the voters and "would fail to give train operated rapid transit and with it the special benefit to adjacent property accruing from real rapid transit."

A system of this kind could not be considered as anything but a street railway facility, the commission says.

The original recommendations of the Rapid Transit Commission called for the construction of 46.6 miles of subways at a cost of $189,000,000. This plan is listed in the latest report as No. 1. The second alternative embraces the construction of 30.75 miles of tubes; No. 3, the Woodward, Grand River and Gratiot lines, 21.1 miles. The Woodward Avenue line, 7½ miles in length, comprises No. 4. Any one of these plans can be adopted and added to in the future, if the people desire to accomplish rapid transit in that form, the commission adds, although it urged against piecemeal construction.

The Rapid Transit Commission is a body created by the charter. Members are appointed by the Mayor. The report made public on Dec. 30 was submitted to the Mayor's finance committee Dec. 10, but was not made public at once at the request of the Rapid Transit Commission. Mayor Smith announced his approval of a "dip" plan at a meeting with the police in charge of the new traffic survey and the City Council on Dec. 29.

Chicago Franchise Question to Be Aired Again

With less than four weeks remaining for settlement of Chicago's traction difficulties before the existing franchises expire, Henry A. Blair, John J. Mitchell and Frederick H. Rawson, receivers for the Chicago Railways, and Leonard A. Busby, president of the Chicago City Railway, are to be given a final opportunity to explain their attitude on the question of an extension of their present twenty-year franchises, or to bring forward any other plan for the permanent solution of the problem, when they appear before the local transportation committee on Jan. 7.

Francis X. Busch, counsel for the city, is also expected to have ready at that time the tentative draft of the proposed new unified ordinances for the surface and elevated lines.

The delay in presenting this new ordinance has been caused by a deadlock on the question of regulation. While both sides agree that a commission of three or five members shall regulate the lines, they are widely apart on the question of who shall appoint the commission. Mr. Busch insists that the appointing power be vested in the Mayor, while the companies demand that they be permitted to appoint one member, the city the other, the third to be selected by agreement between the two others.

On Monday, Jan. 10, the revised draft of the ordinance proposed by the F. J. Lisman interests of New York will be resubmitted to the City Council. Further hearings on the Chicago Motor Coach Company's city-wide bus plan are likewise scheduled for next week.

Awaiting the appearance of the traction officials and bankers, members of the local transportation committee were inclined to lay the blame for the long delay in settlement on the companies themselves. The matter has been lying dormant, they declare, since Oct. 22, when the companies promised to sit in with them for the purpose of framing a new ordinance, Many of them are openly opposed to a franchise extension for the surface lines.

At a meeting on Jan. 3, Corporation Counsel Busch warned the Aldermen that the city must enter into some kind of agreement or contract before Feb. 1 if it is to protect its rights under the 1907 ordinance. "Any first mortgage bondholder can go into the federal court after Feb. 1 and protest the further payment of the city's 55 per cent of the net earnings while the bonds are in default," he pointed out.

In the case of the Chicago Railways, said Mr. Busch, any extension of the franchise would have to be accepted by the court, in spite of repeated assurances of the receivers.

Mr. Busch also suggested to the Aldermen that it would be more advisable to pass an ordinance providing for a "day-to-day" extension because there was some question as to whether the court would permit the Chicago Railways to accept an extension for a definite length of time.

Because the filing of an intervening petition in the Chicago Railways receivership with the federal district court would be equivalent to recognition of the propriety of receivership procedure, Mr. Busch announced that he would not file the petition as he previously intended. [This petition was referred to in ELECTRIC RAILWAY JOURNAL for Jan. 1, 1927.] "The prudent thing to do," Mr. Brush said, "is to keep out as long as the city's rights are respected."

Terminable Permit Favored

Commission Recommends Passage of Legislation to Remove the Present Limitation

Elimination of the present twenty-year limitation on electric railway franchises in Illinois has been recommended by the state terminable permit commission. Announcement to this effect was made on Jan. 4 by a sub-committee. The commission went on record as favoring the right to terminate the permit, for cause or by purchase, and as believing in the soundness of the policy of regulation of public utilities by some governmental agency in matters of rates, service and financing, protecting the utility, the local municipality and the customers in their respective rights.

The report was submitted to the commission by a sub-committee of which Senator Richard Barr, Joliet, is chairman. Other members are Thurlow G. Essington, Streator, and Harold Kessinger, Aurora. The report follows:

> It is the conclusion of this commission, and the practical working under the laws of other states shows, that the terminable permit has been the occasion of continuity of operation, not restricted by misunderstandings and bickerings incidental to the termination of an old franchise and the securing of a new one; that it has permitted wise and cheap financing, which, in turn, has permitted continuous growth, expansion and extensions required for the service of the inhabitants of the different communities served; that public utility questions have, to a large measure, been removed from politics; and that, as a result of all of these things, a higher standard and character of service has been attained, rates have been reduced, confidence of the investors on the one hand and of the utility patrons on the other hand has been established; and the entire public utility situation has been enormously improved.
>
> This commission found that in the laws of the various states there are differences as to what body or authority shall issue the terminable permits, what body or authority shall have the right to revoke such permits, and what body or authority shall regulate the utility companies during the existence of the permits; but, so far as the terminable permit itself is concerned, there was practically unanimity of opinion in its favor and in its superiority to the definite term franchise.
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> The commission is further of the opinion that, in the issuance of terminable permits, the rights of the municipality to make reasonable requirements regarding the use of its streets and public places shall be maintained; and that the right to terminate the permit for cause or by purchase shall be provided. The commission further states unqualifiedly its belief in the soundness of the policy of regulation of public utilities by some governmental agency in matters of rates, service and financing, protecting the utility, the local municipality and the customers in their respective rights, but where this power of regulation should be placed is a matter upon which the commission was not authorized by the act of its creation to investigate or report.
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> This commission therefore recommends that appropriate legislation be adopted at this session of the General Assembly removing the present limitation of twenty years as the maximum term for which franchises may be granted to street railways; and authorizing the issuance of terminable permits to public utilities operating within this state, under such terms and conditions as may be deemed wise by this General Assembly to insure continuous and efficient operation of the utilities and to protect the public as to service and rates and its rights in and to streets and public places.

Final Briefs in Denver Franchise Case

Final arguments in the case involving the franchise of the Denver Tramway, Denver, Col., will be heard by the Supreme Court of the United States on about Jan. 15. At that time the court will be asked to decide whether the tramway has a perpetual franchise or whether it is bound by a twenty-year franchise, granted in 1906 and calling for a 5-cent fare. The contention of the city is that the company is bound to carry passengers in Denver for a 5-cent fare, in accordance with the 1906 franchise. The company argues that the 1906 franchise is a regulatory statute that became invalid when it was established that a 5-cent fare would not yield a reasonable return on the money invested.

In the District Court in Denver, Judge Lewis decided that the Denver Tramway has a perpetual franchise granted by ordinances of 1883 and 1886. He also held that the company is entitled to a return of 7½ per cent on a valuation of $23,000,000, and that it is confiscatory for the city to seek to impose a fare that does not provide the proper return.

Attorneys for the city will argue that granting of perpetual charters is forbidden by the state constitution of Colorado, and that the State Supreme Court has so ruled on three occasions.

Parking Banned in Rush Hours

In accordance with a new traffic regulation recently promulgated by the police department, parking is forbidden on Broad Street, Newark, N. J., in the district between the Lackawanna Railroad station and Clinton Avenue, and on Market Street from the Pennsylvania Railroad station to the court house, between 8 and 9 a.m. and 4:30 and 6 p.m. The new rule became effective on Jan. 3, after extended investigations made by the city's engineers, Parsons, Klapp, Brinckerhoff & Douglas, had demonstrated the serious interference to traffic caused by automobiles parked in solid rows along these streets, sometimes two or three abreast. The new regulation will be tried for a month. Checks are now being made to determine the effect on speed of traffic movement, particularly that of street cars and buses. Reduced congestion and increased speed are expected to result.

Wages Being Discussed in Milwaukee

Negotiations are under way for a new supplementary wage agreement for the next six months beginning Jan. 1 between trainmen and officials of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. A demand for a wage boost of 5 cents an hour has been drafted for the trainmen in Milwaukee, Racine and Kenosha, and on all interurban lines operated by the company. A 5-cent increase was requested six months ago, but was turned down. The increase, if granted, will apply to one-man car operators, who are receiving a maximum of 66 cents an hour now, and two-man car trainmen, who are now receiving 61 cents an hour.

A 2½-Cent Fare for Short Pittsburgh Line

The Pittsburgh Railways, Pittsburgh, Pa., established a round-trip fare of 5 cents on Jan. 1 on what is known as the Library Shuttle Route No. 525. This route, located in the Borough of Braddock, is only about 0.2 mile long, operating from Library and Braddock Avenues to Bell and Jones Streets. It serves as a transfer link with two other routes and also affords a connection between the business district of Braddock and the residential district near Bell and Jones Streets. The distance is short, but the territory is rather hilly. However, it was apparent that very few persons were willing to pay 8⅓ cents merely for a ride over this section. Inasmuch as the single car used on this route always had plenty of room it was decided to give the local public the opportunity to use the service at the lowest feasible price. This led to the establishment of a round-trip non-transfer rate of 5 cents, much to the satisfaction of the Braddock merchants, who believe this will stimulate trade.

Transit Survey in Philadelphia

An investigation into the transportation facilities in Philadelphia, Pa, which will be followed by public hearings and action on future transit needs, is to be undertaken shortly in Philadelphia by the Pennsylvania Public Service Commission.

In furtherance of this plan, Charles C. McChord, former chairman of the Interstate Commerce Commission, has been engaged by the commission to make a comprehensive survey of the city's transit problems. His engineering and legal aids will make an exhaustive study of the city-P.R.T. contract of 1907 and the entire structure of the company's underlying companies preliminary to submitting the report to the Pennsylvania Public Service Commission. The McChord survey will also take in the Broad Street subway, the Chestnut Street tube and the Frankford elevated system. The final argument on the latter lease agreement had been scheduled for Feb. 7. However, it was indicated that final decision on the Frankford elevated and Chestnut Street subway leases would be withheld by the commission pending the outcome of the inquiry now authorized.

Simultaneously with the transit study the commission will begin its probe of the car riders' complaints about alleged curtailment of the Philadelphia Rapid Transit Company's service.

Franchise Draft Ready in Kansas City

The proposed new franchise for the Kansas City Public Service Company, Kansas City, Mo., recently drafted by the franchise committee of the City Council failed to touch upon two important considerations which will have to be taken up when work on the actual franchise is started. These are buses and extensions. Just what provision will be made with regard to a new grant for buses is a point upon which the special franchise committee is undecided. The question of extensions is bound up to some extent with the question of buses. The old franchise required specific extensions, and new trackage each year. However, with the increased interest in motor transportation such provisions are deemed impracticable. For them will probably be substituted a requirement of extension when necessary. Councilman A. N. Gossett, chairman of the special franchise committee, says that a draft of the final franchise will probably be ready for submission to the Council by Feb. 1.

San Francisco Trainmen Receive Pay Increase

Nine hundred trainmen of the San Francisco Municipal Railway, San Francisco, Cal., received an increase in pay of 20 cents a day, effective Jan. 1. Under the new scale platform men will receive $6 a day instead of the former $5.80. The increase makes a total of 60 cents a day during the past six months, an increase of 40 cents a day having been granted platform men last summer. The increase ends a long deadlock with the Board of Supervisors, the Mayor and the Board of Works, during which time it was charged that if further increases were granted a deficit would be created in the operating revenue of the road.

Supervisor James B. McSheehy, chairman of the finance committee of the board, was among those who doubted that receipts of the Municipal Railway would take care of the additional wages. He is reported to have said:

> The finances of the Municipal Railway were drained to the last drop to handle the 40-cents-a-day raise to platform men last April. There is nothing else they can use. Not a nickel is available to cover the 20-cent increase granted to other workers of the road last week.

The business of the railroad, according to Superintendent Boeken, has shown no increase over last year's receipts for the past six or seven months. He explained the lack of funds as follows:

> When the raise was granted last April, and for a month or two thereafter, the road was running along with an average normal growth in receipts amounting to approximately 3½ per cent annually. We had every reason to anticipate a continuance of that growth, but the falling off of the last six months has been a serious disappointment.
>
> I believe the condition is only temporary. I attribute it to the industrial unrest in part, the strike that has slowed up construction and other unlooked for local conditions that may be removed at any time.

Mr. Boeken explained that the increase in receipts has amounted to only $25,000 for the six months period, instead of the $125,000 expected on the basis of the normal 3½ per cent annual growth. He suggested several alternatives in case no rally occurs to bring the increase in receipts back to normal. He is quoted as follows:

> The $200,000 bond redemption may be put up to the taxpayers in June; the road may be refinanced; fares may be increased; our $20,000 monthly depreciation fund may be drawn against; the city may repay $83,000 it still owes on the railroad's loan for the tunnels; or the city might even pay the railroad interest on funds on deposit for the past fifteen years, aggregating approximately $500,000.

The railroad is paying off $200,000 annually on its funded debt.

Drastic Parking Ordinance in Philadelphia

A bill to ban parking in Philadelphia, Pa., was reported favorably in the City Council by the public safety committee on Dec. 30. If the measure becomes a law it will abolish parking of cars between 6:30 a.m. and 7 p.m. in the large area within the boundaries of Spring Garden and South Streets and the Schuykill and Delaware Rivers. Besides, it will bar parking during any hours of the day or night on streets less than 20 ft. wide in any part of the city and particularly specified Fifth, Sixth, Eleventh, Twelfth, Thirteenth, Broad, Fifteenth and Sixteenth Streets in the 24-hour ban. It also provides that no cars may be parked in any street in the city between 3 a.m. and sunrise.

A second ordinance provided for the establishment of a "pound" where cars violating the no-parking laws may be taken by the police. This measure was returned by the committee to City Solicitor Gaffney for a ruling on its legality. One of the disputed points in the measure was the extent of the city's liability in case impounded cars were damaged.

Director Elliott asserted at a hearing on Dec. 30 that the new measures would be enforced to the full capacity in his department or else he would bring the law back and tell the people why it failed. His plea came at the end of the three-hour session of the committee, during which representatives of various organizations and business establishments appeared to present their arguments. It was stated that business firms located on streets in the center of the city were oppressed by drivers who lined the streets with parked automobiles.

J. Barton Weeks. president of the Keystone Automobile Club, issued a statement opposing the no-parking ordinance and charging that existing parking measures had never been enforced and were at present dead letters.

Kane J. Green, president of the Automobile Club of Philadelphia, declared that that organization was heartily in favor of the ordinance. He said that if there were room for proper movement of traffic and also for parking space it was all right to have both, but when parking interfered with movement as it did in Philadelphia, then it was logical that parking should be prohibited.

Further Suspension of International Railway Schedule

The Public Service Commission on Jan. 4 further suspended to and including April 12 increases in rates filed by the International Railway, proposed as effective on Oct. 16 last, on its Buffalo-Niagara Falls high-speed line, the Buffalo-Lockport-Olcott division and in the city of Lockport. The schedules are to remain under suspension until April 12 unless otherwise ordered by the commission. The commission suspended the proposed increase in rates on Oct. 6 to and including Jan. 12 pending a showing of necessity by the railway for the proposed increase. The order of Jan. 4 continues the suspension until April 12.

News Notes

Fare Raised.—The Lake Superior District Power Company was recently authorized by the Michigan Public Utilities Commission to charge an 8-cent cash fare in Ironwood, Mich. The old fare was 5 cents.

Tokens in Indianapolis.—Metal tokens supplanted tickets on the cars of the Indianapolis Street Railway, Indianapolis, Ind., on Jan. 1. Conductors, however, continued to receive outstanding tickets. Fare boxes have been installed on the cars and passengers will deposit the cash fare of 7 cents or a token, which may be purchased four for a quarter. The cost of installation was about $30,000 and the company issued pamphlets telling of the reasons for the installation.

$106,000 Bonus in Los Angeles.—The Los Angeles Railway, Los Angeles, Cal., distributed $106,000 as 1926 bonuses to 2,147 trainmen in its service. All men receiving the special awards were presented with their checks by the superintendent of their particular division. It was mentioned recently in the ELECTRIC RAILWAY JOURNAL that the special award plan on the Los Angeles property had been changed for 1927 so that every trainman in the company could participate regardless of his division affiliations.

Another Skip-Stop Hearing in Baltimore.—The Maryland Public Service Commission has set Jan. 17 as the date to resume hearings on the skip-stop system that has been placed in operation during the morning and evening rush hours by the United Railways & Electric Company, Baltimore. The first hearing was held a few weeks ago.

New Line Planned.—A plan of action is to be formulated shortly looking toward construction by the Pacific Electric Railway, Los Angeles, Cal., of a line through Santa Ana Canyon between Stern and Corona. Charles A. Bland, manager of the industrial and transportation bureaus of the Pacific Electric Railway, has stated that the committee of fifteen, to which was referred the plan for a short line from the northeast to Long Beach Harbor, has been authorized to work out the details which will give a wide section of that country quick ingress to the harbor. The distance between Stern, at which the Pacific Electric Railway line now ends at the western mouth of the canyon, and Corona, at the other end, is about 14 miles. With that stretch of line built, the committee believes that the road will see its way clear to connect with Marlboro and Anaheim with another 5-mile stretch.

Greetings from Washington.—A token inscribed with the names of the Washington Railway & Electric Company and the Capital Traction Company and melted onto a white beveled edge 6 x 4 card carries the Christmas and New Year's greeting of C. Melville Sharpe, executive assistant of the Washington Railway & Electric Company, Washington, D. C. The card reads as follows: "C. Melville Sharpe sends a token for Christmas and wishes you kilowatts of joy during the New Year."

Trolleys Meet Emergency.—The Boston & Worcester Street Railway, Framingham, Mass., which operates a bus line between Hudson and Fayville, Mass., via Marlboro and Southboro, was forced recently to return to trolley operation to provide service to the public. A treacherous ice storm made the hills impassable for buses. The trolleys were returned to service for safety sake.

Temporary Fare Agreement Extended.—At a special session of the City Council of London, Ont., on Dec. 28 the temporary agreement between the city and the London Street Railway was extended for three months. Under this agreement the rate of fare is 5 cents, instead of 7 with nine tickets for 25 cents, as specified in the by-law. The Council proposes to go into the matter fully and will submit to the electors some plan of definite settlement of a lengthy controversy. At the municipal election the people turned down a proposal for renewal of franchise and also a by-law for purchase of the lines. The question of granting licenses to independent buses operating in opposition to the London Street Railway was discussed briefly.

Olive Street Not Wide Enough.—Seven members of the St. Louis, Mo., Board of Aldermen, who visited New Orleans to inspect thoroughfares with parkways for trolley cars, returned to St. Louis convinced that the plan was not practical for Olive Street. Parkways for cars of the St. Louis Public Service Company have been proposed for Olive Street when that street is widened from 60 to 100 ft. between Twelfth Boulevard and Channing Avenue. Several of the Aldermen said that their observations in New Orleans, where many streets, both wide and narrow, include such parkways, convinced them that Olive Street would not be wide enough to make a curb-off trolley right-of-way economical.

Volunteers to Reduce Fares.—David P. Strickler, president of the Colorado Springs & Interurban Railway, Colorado Springs, Col., recently proposed to the City Council to reduce fares, both on the company's tramcars and buses. The reduction, if granted, would do away with the two rides for 15 cents, substituting the sale of fourteen rides (checks) for $1. This is equivalent to a reduction of one-fourth of 1 cent per ride. The Council asked Mr. Strickler to make an offer on a 50-cent lot. This will likely be submitted and the whole approved.

More Safety in Altoona.—A safety campaign to extend throughout 1927 was launched by the employees of the Altoona & Logan Valley Electric Railway and its subsidiary, the Logan Valley Bus Compauy, Altoona, Pa. Two teams are being organized, one including men on the roster designated by even numbers, the other team designated by odd numbers. The contest will continue from week to week with an award made to the teams monthly. A map 30 ft. square, showing the entire holdings, is to be used to mark the "accident centers."

Foreign News

South African Trams Lose Revenue from Bus Competition

Municipal tramways in South African cities are finding it increasingly difficult to meet the competition of the bus lines, according to a report made to the Department of Commerce. As an illustration of the seriousness of the position from the standpoint of the tramways, the report points out that in 1925 the trams carried 2,500,000 fewer passengers than they did in 1924 with a loss of revenue of more than £30,000.

Among the remedies suggested, one that is receiving serious consideration is the setting up of a transport commission by either the union government or the various provinces, to regulate routes, fares and general working conditions. The big problem is to find the proper economic fields for both trams and buses, the question being aggravated by the fact that the trams are largely municipal ventures and the buses private enterprises.

Swiss-Argentine Railway Capitalized at $6,000,000

"La Société d'Electricité pour l'Amerique du Sud" is the name of the new $6,000,000 company which has recently been formed in the city of Zurich to take over control of the following companies: The Great Southern Railway in Buenos Aires; the tramway system and the electricity and gas works in Bahia Blanca, and the Compania Americana de Luz at Asuncion. This new company, according to reports which are being circulated, is said to be financed by a group of English, Swiss and Italian financiers.

Hull Corporation Tramways Reinstates Strikers.—Strikers of the Hull Corporation Tramways who walked out in the general tramway strike last May are gradually being absorbed into service again by means of a plan adopted by the tramways committee. A new arrangement of a five-day working week makes it possible to reinstate the strikers and at the same time retain the services of the volunteers who have been filling the other men's places for the last seven months. The plan is also being aided by increasing the bus service.

Transformer Station for Midi of France Railway.—In connection with the electrification of the railroad between Bedous and the Spanish frontier, Midi of France Railway has lately placed a contract with the Société Alsacienne de Constructions Mécaniques of Belfort for the equipment of a 60,000-volt outdoor transformer station. The order includes three large transformers to convert three-phase, 50-cycle current and eighteen 575-kw., six-phase converters to give continuous current at 1,570 volts.

Recent Bus Developments

Twin City in Taxi Field

Announcement Made of Cab Purchase at Minneapolis as Further Co-ordination Move

The Twin City Rapid Transit Company, Minneapolis, Minn., has acquired a majority of the stock and control of the Yellow Cab Corporation of Minnesota. The deal was announced on Dec. 31. It was negotiated through Lane, Piper & Jaffray, Inc., Minneapolis, brokers, and is reported to have involved slightly more than $500,000.

This transaction followed in three days announcement of the formation of the Delaware corporation to merge the Yellow Cab and the Red Top taxi service in the Twin Cities, the Yellow Cab taxi service in Duluth, Minn., the Town Taxi and Drive Yourself services in Minneapolis and Rochester, Minn., which involved about $1,000,000, it was reported at the time.

Co-ordination Plan Achieved

With the consummation of this deal the Twin City Rapid Transit Company now controls the electric railway service in the Twin Cities area, the interurban bus service and the majority of the taxi service, there being still some independent companies operating. Horace Lowry, president of the company, said:

> The purchase of the control of the taxicab fleet is sound and logical from every standpoint. When we learned that the five companies were consolidated we decided that the next progressive step toward the unification of transportation in the Twin Cities should be taken by us if we were to serve the interests of the public.
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> We therefore purchased the stock control of the merged companies. Duplication of the organizations and the facilities of the taxi companies has been a source of unnecessary traffic congestion and has not been conducive to the best interests of the public. We are going to do away with this duplication and bind the taxicab business into one sound operating unit, and the Twin Cities may be assured of our utmost efforts toward an improved service which will not be excelled in this country.
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> While control of the taxicabs in the Twin Cities, together with the ownership of the railway and the bus lines, gives the parent company virtual control of public transportation service, that service is under supervision either by the state or the city. I believe that this unification will best serve the public interest in that it gives more efficient and better service, and I believe further that, given time, we can demonstrate clearly that the transaction is a sound and logical one, and is the ultimate solution of modern transportation difficulties.

City in Front Rank

Robert F. Pack, chairman of the board of the newly formed Yellow Cab Corporation, who as head of the Northern States Power Company is familiar with public service operation, said:

> There is no reason why the taxicab business, offering a necessary public service, should not be run on the same high plane with other transportation facilities. The new system established in Minneapolis by this deal puts the city in the front rank of a new transportation development.

Formation of the Yellow Cab Corporation of Minnesota was first reported by way of Chicago on Dec. 13, but was not confirmed in Minneapolis until Dec. 28. P. W. Loudon was announced as president and J. H. Colman as secretary-treasurer. The company has 330 Yellow Cabs and Red Tops, 50 Hertz sedans, 52 Chevrolets, Chryslers and Fords, with 20 new Red Tops ordered.

The new bus corporation already had advanced the taxicab rate 5 cents a mile from 35 cents minimum and 10 cents for each additional half mile with no charge for extra passengers, and was to give the drivers from $2.50 to $4 more wages a week on a commission basis, and had ordered that all of the taxicabs should be completely inclosed.

The merged lines will be reorganized in the near future. In the formation of the new corporation gross earnings of the merged systems for 1925 were given at $1,667,750 and for the twelve months ended June 30, 1926, at $1,632,652. Eight thousand shares of Class A common stock of the new corporation were reported sold at a price of $22.50 and accrued dividend.

It will be recalled that the motor bus subsidiary of the Twin City Rapid Transit Company acquired the Twin City Motor Bus Company line between the Twin Cities in July 1924, the Brown bus line in November, 1925, and the Green bus line in January, 1926, comprising all the interurban passenger bus service and some suburban lines operated out of the city.

Massachusetts Bus Law Upheld by Supreme Court

Statute Found Not to Be Arbitrary or Unreasonable in Its Requirements —Bus Company, Competing with Electric Railway, Cannot Evade Massachusetts Law by Mingling Interstate with Intrastate Passengers

IN A DECISION handed down by Justice Butler the United States Supreme Court on Jan. 3 upheld the validity of the Massachusetts motor vehicle law as applied to buses. The decision affirmed the action of the lower courts in dismissing the suit of the Interstate Buses Corporation against the Holyoke Street Railway and various municipal, county, district and state officials of Massachusetts. The Supreme Court decision, in brief, held that the bus company could not evade the Massachusetts law by mingling interstate with intrastate passengers and that the law is not arbitrary or unreasonable in its requirements.

Local Licenses Required

The Massachusetts law requires that buses apply for a license and provides penalties for failure to do so and for operation over routes not approved. The Interstate Buses Corporation runs on regular schedule between Hartford, Conn., and Greenfield, Mass., passing through various Massachusetts towns and cities. Its route for some distance parallels the tracks of the Holyoke Street Railway, the lines of which serve several communities in Massachusetts.

The bus company did not take out a license and a number of its chauffeurs were arrested. The company brought suit to restrain such arrests and to test the Massachusetts law. It relied on the fact that its buses follow an interstate route, claiming that because of this they were not subject to the Massachusetts law. The lower court found that the company did an intrastate passenger business as well as an interstate business, carrying both classes of passengers in the same bus.

The suit was brought to restrain the enforcement of a state statute relating to common carriers of passengers by motor vehicles as in conflict with the commerce clause of the Constitution of the United States and with the due process clause of the Fourteenth Amendment. The case was heard before a court of three judges on an agreed statement of facts, and a final decree dismissing the complaint was entered.

Sections 45, 48 A and 49 of c. 159, General Laws, as amended by c. 280, Acts of 1925, contain the provisions attacked:

No person shall operate a motor vehicle upon a public way in any city or town for the carriage of passengers for hire so as to afford a means of transportation similar to that afforded by a railway by indiscriminately receiving and discharging passengers along the route on which the vehicle is operated, or as a business between fixed and regular termini, without first obtaining a license. The licensing authority in a city is its council, in a town is its selectmen; and, as to public ways under its control, is the metropolitan district commission.

Electric Railway Objects

No person shall operate a motor vehicle under such license unless he has also obtained from the Department of Public Utilities a certificate that public convenience and necessity require such operation. Any one operating under a license from local authority and a certificate from the department is declared to be a common carrier and subject to regulation as such. Violations of Secs. 45-48 or of any order, rule or regulation made under them are punishable by fine or imprisonment or both. And the act gives to the Supreme Judicial and Superior Courts jurisdiction in equity to restrain any violation upon petition of the department, any licensing authority, ten citizens of a city or town affected by the violation, or any interested party. Neither license nor certificate is required in respect of such carriage as may be exclusively interstate.

For many years the appellee, the

Holyoke Street Railway, has been a common carrier of passengers by railway in Massachusetts through Holyoke, South Hadley, Granby, Amherst and into Sunderland. Appellant is engaged in the business of transporting passengers for hire by motor vehicle and operates buses between Hartford, Conn., and Greenfield, Mass. It has run its buses between Hartford and Springfield since Dec. 1, 1924, and north of Springfield to Greenfield since about Dec. 15, 1925. Its route in Massachusetts passes through Springfield, West Springfield, Holyoke, Granby, Amherst, Sunderland, Deerfield and Greenfield. With certain exceptions, all its buses run the whole distance between Hartford and Greenfield.

It transports persons from one state into the other, and also those whose journeys begin and end in Massachusetts. Both classes of passengers, intrastate and interstate, are carried in the same vehicles. Intrastate passengers constitute a very substantial part of the whole number carried in Massachusetts. The appellant maintains an office and garage at Springfield and advertises its route and rates.

The buses are operated between fixed terminals in Massachusetts. They run regularly on public ways parallel to and alongside the tracks of the railway and afford transportation similar to that furnished by that company. They stop regularly and also on signal to receive and discharge passengers.

RAILWAY EARNINGS HURT

The operation of the buses in competition with the railway has resulted in substantial loss to the latter. It was established that the appellant has not obtained a license from any of the cities or towns served by the railway, which caused plaintiff's employees to be arrested and prosecuted.

After receiving the facts as just set down the Supreme Court concluded its opinion as follows:

> The statutory provisions in question have been sustained by the highest court of Massachusetts. New York, N. H. & H. Railroad vs. Deister, 253 Mass. 178; Barrows vs. Farnum's Stage Lines, — Mass. —; Boston & M. R.R. vs. Cate, — Mass —; Boston & M. R.R. vs. Hart, — Mass. —; Commonwealth vs. Potter, — Mass.—. And these decisions were followed by the district court in this case.
>
> Appellant's principal contention is that the act contravenes the commerce clause. If as applied it directly interferes with or burdens appellant's interstate commerce, it cannot be sustained regardless of the purpose for which it was passed. See Shafer vs. Farmers Grain Co., 268 U. S. 189, 199; Real Silk Mills vs. Portland, 268 U. S. 325, 336; Colorado vs. United States, 271 U. S. 153, 163; Di Santo vs. Pennsylvania, — U. S. —. The act existed in some form before interstate transportation of passengers for hire by motor vehicle was undertaken. Its purpose is to regulate local and intrastate affairs. Barrows vs. Farnum's Stage Lines, supra. No licenses from local authorities or certificate of public convenience and necessity is required in respect of transportation that is exclusively interstate. Cf. Buck vs. Kuykendall, 267 U. S. 307; Bush Co. vs. Maloy, 267 U. S. 317. The burden is upon appellant to show that enforcement of the act operates to prejudice interstate carriage of passengers. The stipulated facts do not so indicate. The threatened enforcement is to prevent appellant from carrying intrastate passengers without license over that part of its route which is parallel to the street railway. Its right to use the highways between Springfield and Hartford is not in controversy. While it appears that in Massachusetts both classes of passengers are carried in the same vehicles, it is not shown what part of the total number are intrastate or interstate. The record contains no information as to the number of persons, if any, traveling in interstate commerce on appellant's buses over the part of the route competing with the street railway. It is not shown that the two classes of business are so commingled that the separation of one from the other is not reasonably practicable or that appellant's interstate passengers may not be carried efficiently and economically in buses used exclusively for that purpose or that appellant's interstate business is dependent in any degree upon the local business in question. Appellant may not evade the act by the mere linking of its intrastate transportation to its interstate or by the unnecessary transportation of both classes by means of the same instrumentalities and employees. The appellant relies on Western Union Tel. Co. vs. Kansas, 216 U. S. 1, and Pullman Co. vs. Kansas, 216 U. S. 56. But there the state was using its authority as a means to accomplish a result beyond its constitutional power.
>
> ### ACT IS NOT CONFISCATORY
>
> There is no support for the contention that the enforcement of the act deprives it of its property without due process of law. Undoubtedly, the state has power in the public interest reasonably to control and regulate the use of its highways so long as it does not directly burden or interfere with interstate commerce. Packard vs. Banton, 264 U. S. 140, 144; Kane vs. New Jersey, 242 U. S. 160; Hendrick vs. Maryland, 235 U. S. 610. Cf. Opinion of the Justices, 251 Mass. 594, 596. The terms of the act are not arbitrary or unreasonable. Appellant has not applied for and does not show that it is entitled to have a license from the local authorities or a certificate of public necessity and convenience from the department. Plainly, it has no standing to attack the validity of the statute as a violation of the due process clause.

Four More Rochester Routes Sought

The Rochester Railways Co-Ordinated Bus Lines, Inc., Rochester, N. Y., filed with the Public Service Commission on Jan. 4 a petition for a certificate for the operation of bus lines in the city of Rochester, the village of Hilton and the towns of Parme and Greece, Monroe County. Four routes are proposed in this petition, known as the Grand View Beach line, the Island Cottage Bus Line, the Ridge Road Bus Line and the Manitou Beach line, also known as the Long Pond Route. The Ridge Road Passenger Lines, Inc., which formerly operated the Ridge Road bus line, has been merged with the petitioner. A public hearing will be held on this application.

Extension of Bus Service Permitted.—A certificate has been granted by the Railroad Commission to the Pacific Electric Railway to operate a coach service for the transportation of passengers between Beverly Hills and Los Angeles, Cal., and intermediate points along the line.

Service Discontinued.—Permission to discontinue the operation of regular bus service between Salt Lake City and Ogden, Utah, effective on Dec. 25, was granted the Bamberger Transportation Company by the Public Utilities Commission of Utah. Application for permission to discontinue such service was filed with the commission by Julian Bamberger, president and general manager of the bus subsidiary of the Bamberger Electric Railroad, on the ground that the public did not seem to require this service at this season of the year. Attention is called in the application to the fact that from Dec. 15 to 21, both inclusive, only 134 passengers were carried by the buses. The total cost of operating the buses during that period was $536, while the total revenue was only $135.

Bus Agreement Lost.—The track removal agreement for Filbert Street, Philadelphia, Pa., with the Philadelphia Rapid Transit Company and its subsidiaries was halted recently. The pact was lost en route to Mayor Kendrick and no explanation has been offered. The agreement carries a ten-year bus franchise on the Pennsylvania Boulevard, which is to take the place of Filbert Street. The project to be carried out under the agreement by the city and the Pennsylvania Railroad, at a cost of $53,000,000, includes a tunnel from the West Philadelphia Station to Broad Street Station, improvements to both terminals, widening of Twentieth Street, a Schuykill driveway and other highway projects.

Seeks to Run Line in Western Utica.—The Public Service Commission held a public hearing on Dec. 30 on the petition of the Utica Railway Co-Ordinated Bus Lines, Inc., for a certificate for the operation of a bus line in the western part of the city of Utica. C. N. Phillips, attorney, representing Kernan & Kernan, counsel for the company, appeared for the petitioners. The city of Utica was not represented, but the commission was advised by Clarence E. Williams, Corporation Counsel, that the city is agreeable to granting the franchise. The proposed route will, it is shown, give transportation service to a section of the city which is rapidly developing. Rates of fare are to be the same as those charged by the parent company, the New York State Railways, with transfer privileges to and from such lines.

Bus Service to Be Furnished.—The Eastern New York Utilities Corporation applied to the Public Service Commission on Dec. 29 for approval of a declaration of abandonment of two parts of its line in Hudson. The company alleged that by reason of changes in conditions, development of the city and economic conditions affecting the properties of the company the petition was advanced for the discontinuance with the approval of the city of Hudson. The Eastern New York Transportation Corporation, a subsidiary, proposes to furnish bus service and exchange transfers from its main line to Hudson and in the town of Greenport, where the bus service will be provided.

Buses Supplying Service.—The strike of the street railway employees of the Danbury Power & Transportation Company, Danbury, Conn., is gradually abating. The company was granted temporary certificates to operate buses over any and all of its routes two weeks ago by the Public Utilities Commission. Ten buses are now in use and recently the company placed an order with the Yellow Truck & Coach Manufacturing Company, Chicago, Ill., for four more of the latest type coaches. This step is in line with the plan to motorize its franchise holdings in Danbury and Bethel.

Financial and Corporate

Patronage Gains on Chicago Surface Lines

For the first eleven months of 1926, ended Nov. 30, 1,433,929,014 passengers were carried by the Chicago Surface Lines, Chicago, Ill., against 1,382,623,114 in the corresponding period of 1925. A more accurate picture of the heavy amount of traffic handled over the corresponding months of last year is noted in the following tabulation:

	1926	1925
January	129,604,602	127,666,571
February	121,282,868	115,830,619
March	131,839,632	128,009,030
April	131,452,890	126,052,447
May	132,939,381	127,542,240
June	132,980,301	125,684,909
July	130,235,208	124,566,209
August	129,214,055	125,002,113
September	127,149,619	122,964,778
October	135,878,579	132,515,318
November	131,351,870	126,788,880
December	....	132,949,576

Divisible receipts for November amounted to $628,628 after taxes, renewals and return on purchase price, against $716,111 in October and $422,172 in November, 1925.

The income account for November, 1926, compared with that of the corresponding month in 1925 is as follows:

	1926	1925
Gross earnings	$5,151,860	$4,939,131
Operating expenses and taxes.	3,813,294	3,834,735
Residue receipts	1,338,566	1,104,396
Joint account expense	37,725	10,000
5 per cent interest on purchase	672,212	672,224
Divisible receipts	628,628	422,172
City's 55 per cent	345,746	232,194
Company's 45 per cent	283,883	189,977

Certificates and Coupons Burn in St. Louis

Almost $5,000,000 of canceled obligations of Receiver Rolla Wells of the United Railways, St. Louis, Mo., were burned in the fireplace of the office of James J. O'Connor, clerk of the United States Court for the Eastern District of Missouri in the Federal Building, St. Louis, on Dec. 27. The proceeding marked another step toward the final reorganization of the railway properties. Series B of certificates issued by Receiver Wells totaling $4,200,000 and $630,000 in interest coupons were fed to the flames after they had been redeemed. The certificates were issued by Receiver Wells in 1923 to take up other securities of the railways.

Negotiations for a new blanket franchise from the city of St. Louis is the next and probably the final step in the reorganization program.

Reorganization Plans of Indiana Property Going Forward

Reorganization of the Fort Wayne, Van Wert & Lima Traction Company, operating more than 65 miles of trackage between Lima, Ohio, and Fort Wayne, Ind., is being perfected, and articles of incorporation for the new corporations controlling the line have been filed with the Secretaries of State in both Indiana and Ohio. The incorporators for the Indiana corporation are Henry C. Paul, Frank M. Cutshall, James M. Barrett, Jr., R. Earl Peters and Leigh Hunt, all of Fort Wayne, while Paul C. Martin, Homer C. Corry, C. I. Gallagher, H. M. Lacey and S. A. Titer, all of Springfield, Ohio, appear on record in the incorporation of the Ohio organization. The traction line serves the intermediate towns of New Haven and Monroeville in Indiana and Dixon Convoy, Middlepoint, Delphos, Scott's Crossing and Elida in Ohio.

The property comes into possession of the new company through its purchase last October by Edward Hopkinson, Philadelphia, representative of the bondholders. The purchase price was $150,000, the property being offered for sale by Mr. Paul, receiver, who had charge of the line since 1921 on an order of the United States federal court. The operation of buses and sale of electric current also are provided for in the articles of incorporation.

$1,137,700 of Winnipeg Stock Subscribed in Forty-eight Hours

The second customer-ownership campaign of the Winnipeg Electric Company, Winnipeg, Man., proved a remarkable success. The sale of 2,500 shares of the company's 7 per cent cumulative preference stock opened on Dec. 13 and was advertised to continue for ten days, but so great was the demand for the shares that the sale closed within 48 hours with 11,377 shares ($1,137,700) applied for by 2,222 customers.

The shares were offered through company employees at par, $100 a share, under a customer-ownership plan. The success of the campaign was due to the energetic efforts of the company and the extensive internal organization, together with a well-planned publicity program conducted by the company. The Customer Ownership Company of Canada, Ltd., co-operated with the company in organizing and directing the campaign. While a limit of 50 shares to any one customer was set, it is interesting to note that the number of shares applied for averaged five shares to each customer.

The first 2,500 shares offered by the company form part of an issue of $3,000,000, par value, of preferred stock put on the market a few years ago, and authorization for new preferred stock to take care of the oversubscription will be sought from the shareholders at a meeting to be held on Jan. 20.

The first customer-ownership campaign undertaken by the Winnipeg Electric was conducted in March, 1925, and 2,645 shares were sold to 1,280 purchasers. As a result of the two campaigns the Winnipeg Electric Company will have nearly 3,500 local preferred shareholders.

The sale just concluded marks one of the most outstanding customer-ownership campaigns undertaken by any public utility in the Dominion.

Another Dividend on Common Stock.—The Springfield Railway, Springfield, Mass., recently declared a dividend of $1.15 a share on the common stock and the regular semi-annual preferred dividend of $2 a share, both payable Jan. 3 to stockholders of record of Dec. 20. Six months ago $1.60 was paid on the common stock.

Capital Increased.—The British Columbia Railway, Vancouver, B. C., decided at its annual meeting in London, held on Dec. 16, to increase its capital to £5,320,000 by the issuance of 320,000 new shares of stock at £1 each. Successful operation of the company during the past year was evidenced in the address made to the shareholders at that meeting by George Kidd, the president, who has been in charge of its affairs for 12 years. He told how the railway had carried more than 72,500,000 passengers and 417,000 tons of freight, and also that motor coaches and lorries had been added to the equipment as feeders to the railway system.

Abandonment Record Closed. — The Public Service Commission of New York on Jan. 5 granted the petition of the United Traction Company for approval of a declaration of abandonment of its South Ferry Street line in the city of Albany. There has been no operation on this ⅓-mile route for ten years and in 1925, when the street was repaved, it was agreed with the city to remove the tracks, which was done. The application just granted was made to close the records of the company.

Power Property Sold to Traction President.—The sale of the Clyde River Power Company, Richford, Vt., is reported to have been made to John J. Flyn, president of the Burlington Traction Company, Burlington, Vt., for a sum said to be $500,000. The property that passes to Mr. Flyn includes a water power at Richford and a 50-mile power line. The Clyde River Company has been in the hands of a receiver for some time.

Charleston Deal Approved. — The stockholders of the Charleston Consolidated Railway & Lighting Company, the Charleston Consolidated Railway, Gas & Electric Company, the Charleston-Edison Light & Power Company and the Charleston Gas Light Company have approved the consolidation of these properties into the South Carolina Power Company. This last-named company acquires all the rights and powers of the aforesaid four companies, the stock of which, by agreement, is to be exchanged for stock in the new company. It is part of the plan for control of the South Carolina Power Company to pass to the Southeastern Power & Light Company in accordance with plans announced previously in the ELECTRIC RAILWAY JOURNAL.

Abandonment Hearing Continued.—Hearing on the petition of the receiver of the Detroit United Railway, Detroit, Mich., to discontinue service between Romeo and Imlay City, Mich., has been continued until Feb. 14 by William S. Sayers, Jr., standing master in chancery. A. L. Drum, representing the railway, declared on Dec. 30 the 20-mile line is being operated at an annual loss of $30,000. The plan was opposed by some of the residents affected.

Book Reviews

Mainsprings of Men

By Whiting Williams. New York: Charles Scribner's Sons. 313 pages. $1.50.

Whiting Williams knows his subject. He got much of his material at first hand. Then starting with a bond of sympathy for the worker, he has written a volume that is mighty stimulating. Many of us think we know what we want, but even after we have attained our ambition, few of us know then what to do. As the author points out, we are appreciating as never before the vastness of our human powers and the delicacy of their control. As never before, accordingly, men are searching for the springs of action within themselves and within their fellows—evidently in the belief that the value of a life is measured by its influence upon the thoughts and actions of others.

It is certainly true, on the whole, that teachers and students, statesmen and voters, editors and readers, captains of industry and lieutenants of labor, all are to-day in earnest search of a better understanding of the deeper sources of men's daily doings; between dawn and dusk all these wielders of influence stand or fall according as they secure and direct the physical or the spiritual energies of their fellows. The author saw in the wide-spread urgency of this search the chief warrant of the book's effort to furnish to such seekers a few suggestions capable of daily application. In order to facilitate this practical purpose free use was made of the "case" or "problem" method; wherever possible, a fact or principle is set forth by showing how, in a particular section of human experience, it appeared to operate.

The introduction to the book is confined to a statement of "The Why and the How." The rest of the book is divided into three parts: I. What the worker wants. II. What all of us want. III. Finding what we want in our work. There is the bare outline. It is impossible even to begin to go into the matter of the scope of the contents. To all employers of labor sincere in their desire for a more thorough understanding of this whole problem the book contains many points that should be helpful and much thought-provoking material. It is not merely "just another book on the labor problem," not by any means.

Metropolitan Street Traffic Survey (Chicago)

By Miller McClintock. The Chicago Association of Commerce. 292 pages. $5.

Street traffic studies from the metropolitan standpoint form the basis of Dr. Miller McClintock's report on street traffic survey in Chicago. The report is based on a year's study of actual conditions. It is replete with data, charts and findings made by the corps of investigators. The report contains fifteen chapters divided into two parts, the first presenting the survey data and the second the recommendations indorsed by the Chicago Association of Commerce, under whose auspices the report was made. The report forms the basis for an article which appears elsewhere in this issue of the JOURNAL.

Personenbahnhöfe (Passenger Railway Stations)

By W. Cauer. Berlin: Julius Springer. 306 pages, 142 illustrations. Cloth. 22.50 marks.

This is the second edition of a book first published in 1913. While the contents relate primarily to steam railroad passenger stations, electric railway managers with large terminal or through waiting stations could obtain many suggestions on station layout, arrangement of track, etc. There are a few references to railroad stations in the United States, but the practice described is primarily that of Europe.

American Railway Accounting

Compiled by Elizabeth Cullen, reference librarian Bureau of Railway Economics, Washington, D. C. Railway Accounting Officers Association, Washington, D. C. 52 pages.

This pamphlet is a continuation of bibliography in railway accounting procedure, 1926 edition, and reprinted from "Railway Accounting Procedure," 1927 edition. Part I includes historical matter issued 1925-1926; Part II is a compilation and use of railroad statistics, and Part III concerns depreciation with additional references. The books, documents and periodical articles listed are to be found in public libraries, especially those maintaining special collections on economics and statistics.

The Tired Trolley Car

By Beth A. Retner. Garden City, New York, N. Y.: Doubleday, Page & Company. 1926. 158 pages. Net, $2.

Minnie was weary of working hard and handling over the nickels to Jimmy Jingle. She was tired of Rockaby Street with its bumps and hills, its red-brick houses, graveyard and second-hand animal store. She longed for shops and lights and adventure. Main Street would be the panacea for all her ills. But disillusionment followed close upon the glorious experience. No gentlefolk inhabited Main Street; automobiles "honked," "honked" at her scornfully; none of the shiny-badged policemen seemed glad to see her and a huge moving van came along and bumped her. "Sirrocco, Mirrocco, if I were only back on Rockaby Street."

Minnie is a tired trolley car who longs for thrills and gets them. She is only one of the many whimsical characters in Mr. Retner's latest contribution to juvenile readers. The others include the Wax Lady in love with the Window Dresser; Lucy Dancing Leg; Billy Tick, the fish, and Adam Applepie.

Boys and girls of the fairy-tale age will undoubtedly have genuine sympathy for Minnie, who longs for patent leather shoes and moon balloons, who is enchanted with the superficial grandeur of the Main Street cars and intrigued by their accounts of theaters, department stores and carrousels. But Mr. Retner would have boys and girls also imbibe some of the wisdom Minnie took on after her escapade. There was happiness in every ride on Rockaby Street. The children actually cheered when they passed the graveyard and when they approached the second-hand animal store, that always bought everything and never sold anything—why, there were goldfish to be had for the buying. And what if the curfew sounded at 8 o'clock, something done "had earned a night's repose."

On first reading the title of this book, "The Tired Trolley Car," it appeared to the reviewer that Mr. Retner, well-known humorist, was joining the unattenuated ranks of transit experts. It seemed as though his thesis were a plea for a new form of transportation, since the electric became jaded. But a book cannot be judged by its title. To the average reader of the ELECTRIC RAILWAY JOURNAL the allegory presented by the author of "That's That" may not be especially informative, but it will serve as another reminder that no planning is sufficiently constructive which does not consider the problems of Rockaby Street as well as those of Main Street.

Political and Industrial Democracy—1776-1926

By W. Jett Lauck. New York: Funk & Wagnalls Company. 374 pages. $2.

Political democracy without corresponding industrial freedom is an anachronism, according to W. Jett Lauck, who traces, in his most recent book, the growth of employee ownership and representation in this country. It is worthy of note that of the very few cases cited by Mr. Lauck as being truly democratic in nature he places the plan of Thomas E. Mitten, head of the Philadelphia Rapid Transit Company, pre-eminently in the vanguard. According to the author, this "men and management" organization represents the most comprehensive plan yet set up to provide for the immediate company enfranchisement of labor and the gradual conversion of labor into capital through acquiring common stock.

Mr. Lauck has in this present work made a thorough investigation into the sundry practical plans adopted by various manufacturing companies, railways, etc., to insure continued harmony between capital and labor. The principles and standards essential to the realization of industrial democracy are applied as measures of these plans; present tendencies are analyzed and future developments forecasted.

The book summarizes the principal features of various outstanding plans and thus provides a deal of actual working information which should make valuable reference material. Mr. Lauck's tone is optimistic throughout. He believes that the experiences of the present have shown very conclusively that industrial warfare is unnecessary to the satisfactory working out of labor's interests. Railway men will find particular interest in the fact that the author credits the most comprehensive and satisfactory of existing plans to an electric railway.

Personal Items

"Taking a Year Off"

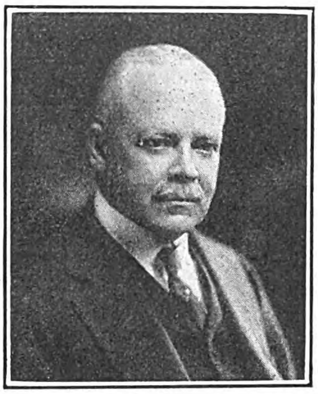
After Forty Years of Aggressive Activity H. M. Atkinson, Atlanta Chairman, Plans to Boost Georgia

After 40 years of activity, in which he has devoted himself to building one of Georgia's greatest industrial enterprises, Harry M. Atkinson, chairman of the board of the Georgia Railway & Power Company, is getting out of harness, so far as attention to business details go.

Beginning Jan. 1, 1927, Mr. Atkinson is "taking a year off." This does not mean that Mr. Atkinson is going to drop out of things. It means that Georgia, as a state, is going to benefit or be benefited, for so long as he lives Mr. Atkinson will always be a builder. His conclusion to forego business details means that he will give more of his time to aiding in a great constructive work in the state. Recently Mr. Atkinson was induced to take the chairmanship of the advisory committee of the Georgia Association, in the hope that he can help President Hastings along practical lines with the association's work. This is not a new interest with him by any means, for Mr. Atkinson has been doing these things a number of years. He and his business associates quite a little while ago took an active interest in improvement of agricultural education in the state, and for some time Mr. Atkinson has been close to the efforts made at the state college.

To those who know him well no surprise was occasioned by this latest announcement by the chairman of the board of the Georgia Railway & Power Company. He is an unobtrusive worker, but the value of his contributions to the community has received public recognition before. Just about a year ago he was selected as having contributed in the twelve months then recently ended more of inspired, effective and unselfish work for the betterment of the community of Atlanta, Ga., than any other citizen. To him was awarded the silver loving cup given annually by the *Georgian and Sunday American* for playing the rôle of Atlanta's most valuable citizen in 1925. The committee's selection, according to the announcement, was based on Mr. Atkinson's activities in industrial development of the North Georgia region, of which Atlanta is the center, through great water-power plans, two of which were completed in 1925 and another projected. His efforts to improve transportation facilities in and around Atlanta and his general record of service for the communities and region development were also cited by the committee.

Mr. Atkinson has been identified with nearly all the important electrical projects that have been put through at Atlanta for more than 25 years and has contributed much to the city's growth and prosperity. He was instrumental in consolidating the railways and lighting companies of Atlanta into the Georgia Railway & Electric Company. He also organized the Georgia Railway & Power Company, which began operating in 1912, and became chairman of the board of directors of that company at the time of its organization. This position he has held up to the present time. In addition to electrical enterprises, he organized, built and was the first president of the Atlanta, Birmingham & Atlantic Railroad, a steam property, which has contributed to the development and prosperity of those sections of Georgia and Alabama served by it. Mr. Atkinson has also found time to take an active interest in the cultural and social life of the community.



H. M. Atkinson

E. F. Thayer Joins P.R.T. Staff

Edwin F. Thayer has resigned as assistant editor of the ELECTRIC RAILWAY JOURNAL to enter public relations work with the Philadelphia Rapid Transit Company, Philadelphia, Pa. In this work he will be associated with J. M. Shaw, who as editor of *P.R.T. Service Talks* directs the public relations activities of the company.

During his connection with the JOURNAL, Mr. Thayer has contributed to all departments of the paper, but he engaged more particularly in the preparation of material for the department Manufactures and the Markets. To this work he brought an unusual combination of talents, a combination which, reinforced by his recent contact with the electric railway industry in its various phases, should be very valuable in his new work.

Mr. Thayer is by profession an engineer, but the urge toward journalism and public relations work has long been strong in him. Thus he served with the Pasadena *Star-News* for three years and the Los Angeles *Examiner* for two years. He was graduated from the California Institute of Technology at Pasadena, where he took a five-year course, receiving the degree of B.S. He had more than a year's experience in street contracting work, but turned from engineering as such to become an engineer-editor, activity that contemplated the exercise of his acquired talent as expressed in his engineering studies and his natural talent manifested in the urge to write.

J. H. Hustis Heads Schenectady Railway

The Delaware & Hudson Company and the New York Central Railroad have announced the election of James H. Hustis, formerly chairman of the Boston & Maine Railroad, as president of the Schenectady Railway, which is jointly owned by them.

Mr. Hustis for several years was identified with the New York Central and later became president of the Boston & Maine, from which post he was elevated to the chairmanship which he lately resigned. He succeeds the late E. M. Walker at Schenectady.

R. B. Stearns and K. S. May Members of Banking Firm

Two former railway men have become members of an investment banking house. They are Russell B. Stearns and Kenneth S. May, who on Jan. 1, 1927, were admitted to general partnership in the firm of Arthur Perry & Company, Boston, Mass.

After Russell B. Stearns was graduated from the University of Michigan, class of 1916, he assumed the duties of assistant to the president of the North American Company, New York. He served overseas during the war and then entered the investment banking business in Boston and became associated with the firm of Arthur Perry & Company in November, 1920. He is vice-president and a director of the Municipal Gas Company of Texas. Mr. Stearns will continue to be located in Boston.

Mr. May was in the class of 1909 at the Massachusetts Institute of Technology, taking the electrical engineering course. After leaving college he was successively connected with the Boston & Worcester Street Railway, the Boston Elevated Railway and for some six years with Stone & Webster in the department which conducted examinations of public utility properties for investment bankers. In May, 1916, Mr. May became associated with Arthur Perry & Company, with headquarters in Boston. He is now located in Philadelphia.

L. P. Miles a Publisher

Lovick P. Miles, attorney for the Memphis Street Railway, Memphis, Tenn., was elected president of the Commercial Publishing Company, publishers of the Commercial *Appeal* and the *Evening Appeal*, at a meeting of the directors on Dec. 8. Mr. Miles was the unanimous choice of the board. He has announced his immediate acceptance and retirement from law practice on March 1, 1927, in order to devote his entire time to the duties of his new office. Mr. Miles is one of the most prominent lawyers in the South. He has had newspaper experience and training. He was engaged at one time as assistant attorney of the Missouri Pacific Railway System and later was general attorney for the same system for western Arkansas and Oklahoma.

New Public Service Transportation Unit Heads

Messrs. Warner and Schreiber, Long in Service of New Jersey Company, Are in Charge of Traffic and Plant Respectively—L. P. Baurhenn Director of Personnel—Messrs. Rothery and Sell Promoted

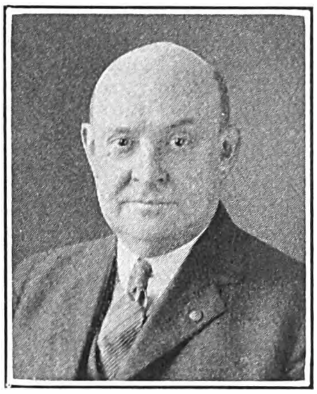
CHANGES in the operating personnel of the Public Service Railway and the Public Service Transportation Company, Newark, N. J., were announced recently by Matthew R. Boylan, vice-president in charge of operation. As indicated previously in the ELECTRIC RAILWAY JOURNAL the purpose is to increase the efficiency of the organization.

A. T. Warner

Arthur T. Warner becomes general manager in charge of traffic. Mr. Warner has been assistant to Vice-President Boylan.

Martin Schreiber becomes general manager in charge of plant. Mr. Schreiber has been manager of the Southern Division.

Louis P. Baurhenn becomes director of personnel. Mr. Baurhenn has been general superintendent.



L. P. Baurhenn

G. A. Rothery

C. L. Sell

George A. Rothery, chief clerk, Camden, succeeds Mr. Schreiber as Southern Division manager and Claude L. Sell, superintendent of employment, Camden, becomes assistant manager.

Mr. Warner was graduated from Lafayette College on June 22, 1910, as an electrical engineer and five days later entered the employ of Public Service Railway as a cadet engineer. He was put to work in the pits at the Newark car shops, and later had experience in other departments of the company. At the end of the two-year course, in 1912, he was assigned to take charge of the traffic department, which was formed at that time. Later he became traffic investigator. He was made traffic engineer on Jan. 1, 1916. He became assistant to Matthew R. Boylan when Mr. Boylan was made acting general manager on Dec. 1, 1923, and continued as his assistant when Mr. Boylan was made vice-president in charge of operation in April, 1924. Mr. Warner is president of the Public Service Section of the American Electric Railway Association and holds important committee places in that organization.

Upon graduating from Ohio State University with the degrees of mechanical and electrical engineer, Mr. Schreiber entered the employ of the Cleveland Electric Railway as an electrician and had risen to the position of engineer in charge of drafting rooms when he resigned in 1903 to become connected with the Public Service as assistant engineer of the railway. Three years later he was made engineer of maintenance of way and later chief engineer for the Public Service Railway and was appointed manager of the Southern Division on Sept. 1, 1920. For sixteen years Mr. Schreiber had charge of the designing and construction of a large number of improvements for Public Service, including carhouses, bridges, ferry slips and ferry houses, sand-drying and stone-crushing plants and commercial buildings. He had charge of the construction of the Public Service Terminal Building in Newark.

After several years of railway experience in New Orleans. Mr. Baurhenn came to New Jersey in 1900 and took a position with the Bergen County Traction Company at Edgewater as general shop foreman in charge of transportation. When the New Jersey & Hudson River Railway & Ferry Company took over the Bergen County Traction Company Mr. Baurhenn became superintendent and purchasing agent of the new company, remaining in that position until 1911. When Public Service took over that company in 1911 Mr. Baurhenn was made division superintendent of Bergen. He was transferred to the Hudson Division as division superintendent in 1915 and two years later went to Essex Division in a similar capacity. In August, 1918, he was made assistant general superintendent and on Dec. 1, 1923, general superintendent.

Martin Schreiber

For the last fourteen years Mr. Rothery has been employed by the Public Service Railway. He started in the inspection department, then went to the general superintendent's office, was chief clerk of Essex Division, and later he was active in special traffic and standardization of carhouse practices, with headquarters at Newark. Since 1920 he has been chief clerk to the manager of Southern Division.

Mr. Sell became connected with the Public Service Railway in 1912 as a motorman. He since has run the gamut of the operating department and has had much to do with the operation and maintenance of buses. Besides, he has been starter, inspector, chief instructor. supervisor of instruction and superintendent of employment.

Obituary

Edwin M. Walker

President of Schenectady Railway a Victim of Monoxide Gas Poisoning —Man of Sterling Qualities

Another name was added to the long list of fatalities attributed to monoxide gas poisoning in the death on Dec. 30 of Edwin M. Walker, president of the Schenectady Railway, Schenectady, N. Y. Apparently he had started to adjust his car, but with the garage doors closed on account of the cold. So it was that the deadly, odorless gas overcame him within a few feet of his unknowing family.

Even the brief mention that the ELECTRIC RAILWAY JOURNAL was able to print at the moment of going to press with the Jan. 1 issue sufficed to prove that Edwin M. Walker had made a host of friends in the industry which he had helped so much to lead to higher ideals. It seemed incredible to them that one still in the flush of his powers and the bounding health of a clean-living man should have been taken away so suddenly.

Those who know the rough and tumble through which many a public utility man has to pass never ceased to admire the scholarly refinement that was always a part of Edwin M. Walker. Whether he was dealing with the employees or the most unreasonable agents of the public, a coarse word never passed his lips. His unmistakable sincerity and faithful performance of any promise made were the weapons that brought him victory without lowering his personality.

Indeed, Edwin M. Walker had inherited from his forebears the finest qualities of the cultured Englishman. His life was the embodiment of Polonius' advice: "Be thou familiar, but by no means vulgar." His charm and tact were felt by men of every degree of education.

These qualities stood him in good stead, for he was ever in the forefront of the struggle for modernizing the electric railway industry. Pioneers have exceptional need of an amiable disposition to make the bitterness of a new idea palatable. Edwin M. Walker had just the right combination of brains, patience and kindliness.

Mr. Walker is best known through his splendid work with the safety car at Terre Haute at a time when the safety car was anathema to most of the field. It was his doctrine that the street railway must take advantage of all technical improvements to give a higher standard of service to a more exacting public. Starting in 1918 with his first safety cars, he soon wiped out most of the jitneys with a railway service much better than they offered and at a fare no higher than 5 cents. Mr. Walker left Terre Haute in 1923, but the fare there remains unchanged, largely because of the extent to which the service has been merchandised.

It is less widely known that he was also a pioneer with the bus. As long ago as September, 1914, when he was manager of what is now the Dubuque Electric Company, Dubuque, Iowa, he installed some improvised Ford buses and later used Edison-cell buses for a bridge operation to East Dubuque. During his stay at Schenectady Mr. Walker also applied for certain bus franchises. From the vantage point of ten years' clear-sighted study, he refused to be swept away by propaganda or hysteria on the matter of car versus bus. For him there was no "versus"; only an "and" to care for conditions where trackways were impracticable or where there was no market for real mass transportation.

E. M. Walker

When he went to Schenectady, late in 1923, it was to accept a most difficult task. A strike had left the company impoverished. Maintenance had been deferred. Much of the rolling stock was antiquated or too heavy. Finally the directors of the two steam railroads which were equal owners of the property assumed a somewhat "defeatist" attitude about electric railways; in other words, they were not sure.

The man who had been chosen to assume the post at Schenectady was equal to the task. Month after month saw an improvement in the reliability of the equipment, and with that improvement came increases in riding and decreases in expenses per car-mile.

It was in this connection that Edwin M. Walker showed his flair for the right kind of publicity. The winter before his advent had seen a complete breakdown of the service in a snowstorm. So his first thought was to guard against any possible repetition of the kind. However, it was not enough only for his men to know that they would be prepared. He wanted the public to know it, too. No space was bought to advertise "We're ready to clean up Old Boreas." Instead, the completely rehabilitated and enlarged snow-fighting equipment was lined up alongside the shops where the thousands of General Electric workers could see for themselves that this time it would be safe to jack up their autos for the winter.

Although Mr. Walker succeeded in securing funds for only part of the new rolling stock he considered essential the new vehicles amply justified their purchase. Shortly before his death, however, he had made recommendations for a modernization program which he firmly believed would make the property at Schenectady one of the finest and most profitable of its size in the country.

Mr. Walker was born at Worksop, England, in 1875. At the age of twelve he came to the United States with his parents. Following a technical education, ever broadened by his love for good literature, he entered the public utility field. After holding positions in gas and electric work at Lockport, Boston and elsewhere, he took charge of the railway and electric property at Dubuque. Next he spent six years to 1923 at Terre Haute, following which he accepted the presidency of the Schenectady Railway.

Hardly the least of Edwin M. Walker's fine qualities was his willingness to give freely of his experience to fellow-craftsmen. He was a hard worker in his territorial bodies and the American Electric Railway Association, a faithful correspondent and a painstaking host. The electric railway industry can never have too many men of his stamp.

F. Harrison Warner, general agent at Greenfield, Ind., for the Terre Haute, Indianapolis & Eastern Traction Company, died recently. He was 60 years old.

Charles Page, Sand Springs, Okla., builder of electric railways and promoter of other utility enterprises, died on Dec. 28.

William T. Fitch, for many years superintendent of the maintenance of way department of the Philadelphia Rapid Transit Company, Philadelphia, Pa., is dead.

Samuel M. Clement, former public service commissioner of Pennsylvania, died in Philadelphia on Dec. 21 of injuries received in a recent taxicab accident. Mr. Clement was president of the Quaker City Cab Company and a director of several local trust and insurance companies. He was 53 years old.

Charles Elmer Gossard, superintendent of the Lewistown & Reedsville Electric Railway, Lewistown, Pa., for 24 years, died on Dec. 28. Mr. Gossard was born at State Line, Franklin County, Pennsylvania. The early years of his life he spent at Altoona. He went to Lewistown 26 years ago and entered electric street railway service there. The late superintendent was 57 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

General Electric Adopts Relief and Loan Plan

A relief and loan plan whereby employees of the General Electric Company who are temporarily idle, working part time or in need of relief because of illness in the family or other emergencies in the home can borrow up to $200, without interest, and repay it by deduction in installments of 10 per cent of weekly pay when back on full time again has been inaugurated at the Schenectady, N. Y., works of the company.

This plan originated among the employees and was presented to the company through the works council some time ago. The employees were told then that if a majority in the employ of the company for one year or more wanted the plan it would not only be adopted but that for every dollar put into the relief and loan fund treasury by the employees the company would put in an additional dollar.

Any employee with the company more than one year is eligible for membership. Fifty cents a month is deducted from each member's pay, 5 cents going into a relief fund and 45 cents to be used as an unemployment loan fund.

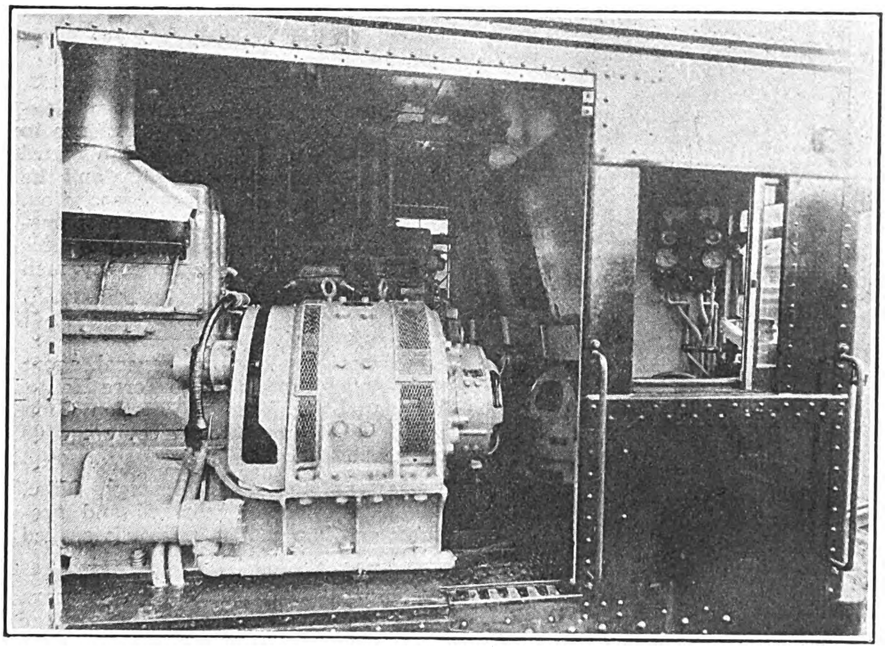
The General Electric Company will act as custodian of the fund and will allow 5 per cent interest thereon. Employee members retired either on a pension or disability relief will be paid the full amount deducted from their wages plus interest at 5 per cent per annum for the average time. Members who leave the employ of the company after one year's membership will be refunded the amount deducted from wages less the amount contributed toward the supplementary relief fund.

All loans and disbursements will be administered by a committee composed of an equal representation of employees elected by the contributors and appointed by the works management.

Lehigh Valley Orders Four Double-Unit Gas-Electric Cars

A recent order for additional motive power placed by the Lehigh Valley Railroad includes four Brill-Westinghouse double-unit gas-electric cars for operation on the stiff grades from Elmira to Canastota and between Wilkes-Barre and Towanda. On these lines grades of 1 and 1.5 per cent are common, while the most severe one is 2.4 per cent for 3.6 miles.

While the floor plans of the cars differ, the exterior dimensions and general characteristics will be the same. Each car will be 70 ft. 6 in. over all and will weigh between 130,000 and 135,000 lb., depending upon the interior arrangement. A compartment 13 ft. 10 in. long at the front of the car will house the power plant, fans, control apparatus and operator's cab. Each of the two power plants will consist of a 250-hp. Brill-Westinghouse engine, driving a 160-kw. Westinghouse generator through a flexible coupling. There will be four 140-hp. type 557-D-8 motors to each car, two fed from each generator. Controls will be of the unit switch type, arranged for single-end operation. Two motor-driven air compressors, each having a displacement of 25 cu.ft. at the rated voltage, are to operate the brakes and controls, and two fans rated at 1,500 r.p.m. have been specified as part of the cooling equipment. The power plants are to be mounted longitudinally and spaced 4 ft. 5 in. center to center, which will permit free access to either side of either unit, as well as providing ample room for an aisle. The cars will replace six regular trains.



Engine-Room Layout of New Gas-Electric Cars for Lehigh Valley Railroad. View Is of Right Side of Car, Showing Generator, Blower Motors, Instrument Boards and Controls

Jobber's Status Discussed

Head of Electric Hose & Rubber Company Makes an Exhaustive Survey of Situation as It Affects Industry

Feeling that the jobber's present status in industry needs a thorough discussion, C. D. Garretson, president of the Electric Hose & Rubber Company, Wilmington, Del., has just prepared a frank and comprehensive study of the subject, which is published in a handsome brochure, entitled "Thinking Thru."

While Mr. Garretson is far from predicting that the position of the jobber is without hope, he likens him to "a weathervane in a cyclone." "He is," continues the author, "grabbing at any line to sell on which he can make money. His full line is a regular hodgepodge, from steel bullets to toothbrushes and from radios to rubber bands. If he looks this condition right square in the face and thinks about it, he will realize that it is not an economical position for him to be in, because of the fact that he is carrying a lot more inventory than he should for the amount of his sales, and, more still, he cannot give the attention to each individual item that it deserves.

"Wouldn't it be better to bring his line down to the number of items to which a jobber can give adequate representation, get his business on a stable basis and make room for other jobbers in the line which he discards?" asks Mr. Garretson. "This intensive competition does not make any more business. It is simply changing the channels in which business should economically flow. A jobber who really adds on lines with the thought that he is going to get more business cannot help but spread his efforts thinner, and eventually he pays the price for this greed."

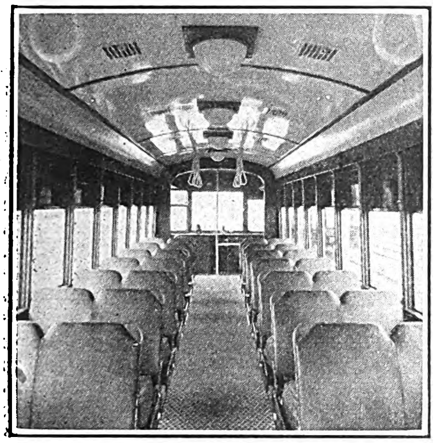
"Thinking Thru" not only contains such arguments as these but is the medium for presenting the business policies of the Electric Hose & Rubber Company in a very human manner. The booklet is now being distributed to the trade.

Brown Boveri Has Good Year

Laurence R. Wilder, president of the American Brown Boveri Electric Corporation, reports a successful year for his corporation. Gross business of the company and its subsidiaries in 1926 is estimated by him at approximately $25,000,000. For 1927 Mr. Wilder predicts a gross of some $35,000,000, this estimate being based on business done and in sight.

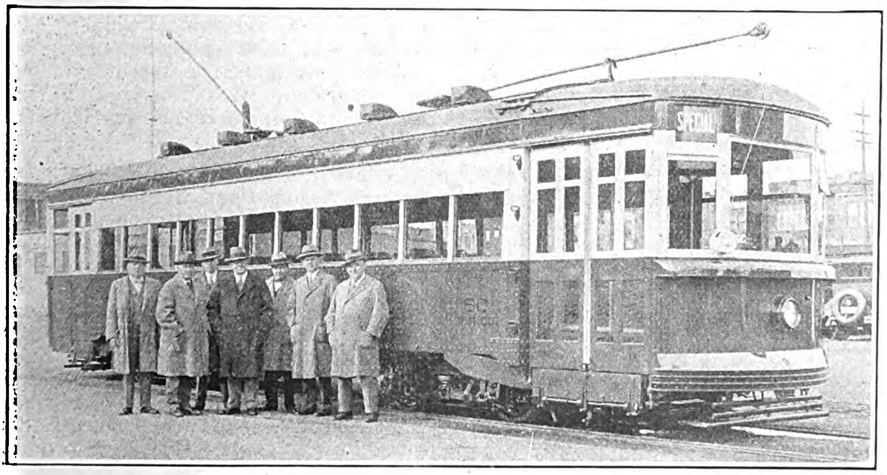
Careful Attention Paid to Interior Appearance of Williamsport Cars

Emphasizing the elements of lightness in weight and flexibility of operation five one-man, two-man cars were recently delivered to the Williamsport Passenger Railway of Williamsport, Pa., by the J. G. Brill Company of Philadelphia, Pa. The interior appearance of these cars is particularly pleasing, Brill seats with brown leather upholstering being standard equipment, while the motorman's operating equipment is inclosed by wood paneling. A large full-vision hinged type of windshield has been installed at either end.


Roomy Interior of Williamsport Passenger Railway's New Cars

Principal specifications of the new units are appended here:

Date order was placed	July 8, 1926
Date of delivery	November, 1926
Seating capacity	44
Weight:	
Car body	19,460 lb.
Trucks	9,600 lb.
Equipment	9,820 lb.
Total	38,880 lb.
Bolster centers, length	19 ft. 8 in.
Length over all	42 ft. 2 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	10 ft. 10½ in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	To A. S. T. M. specification
Bumpers	Hedley anti-climber (four-ribbed)
Car signal system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	4 ft. 3½ in.
Conduits and junction boxes	Brill
Control	K-35
Destination signs	Electric Service Supply 129LR
Door operating mechanism	National Pneumatic
Fare boxes	Johnson type DM-2
Finish	R. F. Johnson's "Krakno"
Gears and pinions	Tool Steel Gear & Pinion Co.
Hand brakes	National Staffless
Heater equipment	Railway Utility Co. cross seat type, 750-watt
Headlights	"Golden Glow" type RRc-96
Journal boxes	MCB 3¾ x 7 in.
Motors	Four Westinghouse No. 510-A, inside hung
Sanders	Keystone
Sash fixtures	Brill
Seats	Brill No. 201-B
Seating material	Genuine leather
Slack adjuster	National Brake Co. type E
Springs	Brill
Step tread	Kass, 5 in.
Trolley catchers	Earll
Trolley base	Nuttall No. 20-A
Trolley wheels	VK-6
Trucks	Brill No. 177-E-1
Ventilators	Railway Utility Co.
Wheels	26 in. diameter



Visiting Inspection Committee from Williamsport Ready to View New Equipment at Brill Plant

Rubber Exchange Announces New Rule

A new rule providing that trading in the current months shall stop at noon of the last trading day upon which transferable notes may be issued for delivery went into operation on the Rubber Exchange of New York Dec. 27. Explaining the new ruling, Secretary Walter Dutton has issued the following statement:

"Transferable notes may be issued up to 12:15 p.m. of the last trading day. This extension of time applies to notices issued against open conditions with the clearing house and also provides for issuing notices against sales made on the last trading day of the current day for delivery on the last day of that month.

"In the latter instance, clearing members may issue transferable notices for such deliveries before 12:15 p.m. on the last trading day, which notices should be issued direct to the clearing members, clearing the purchase, instead of to the clearing house. Such transferable notes must be passed on within a half hour and circulate until the interest in such month is liquidated, not later than 7 p.m. on the date of issue."

25 Noiseless Cars for Twin Cities

Included in the budget of the Twin City Rapid Transit Company, Minneapolis, Minn., is $155,000 for 25 of the new type noiseless cars to be built in 1927. In addition $82,000 is set aside for repair and renewal of old cars. These plans are before the Councils of the two cities of St. Paul and Minneapolis, Minn.

Each of the new cars will weigh about 1,000 lb. more than the original type put into operation four years ago on Nicollet Avenue in Minneapolis, but 11,000 lb. less than the old type of cars in use many years. The proposed cars are similar to those in use for a year on the Bryant and Johnson line in rush hours and tried out on the Nicollet Avenue and the Fourth Avenue routes.

Approval of the plan means 60 per cent will be charged to Minneapolis and 40 per cent to St. Paul operation. For instance, $93,000 would be part of the $680,000 budget for the Minneapolis Street Railway for 1927 improvements.

Extensive Improvement Work in Altoona in 1926

The sum of $726,000 has been expended by the Altoona & Logan Valley Electric Railway and its subsidiary, the Logan Valley Bus Company, Altoona, Pa., during the past year, according to a financial statement submitted by C. A. Brooks, supervisor of railways for the General Engineering & Management Corporation, operating the local lines.

Replacing trackage in the city and on suburban lines cost a total of $311,455. Thirteen new cars were purchased at a cost of $221,714. Equipping cars with safety devices cost $37,000. Buses and bus equipment cost $53,000. Repairs and building construction cost $85,337. The company spent $45,000 for rearranging the power feeders and turning over the power contract to the Penn Central Company, Altoona. Since the Fitkin interests assumed charge of the Altoona lines in March, 1925, practically every route has been rebuilt with heavier rails.

Westinghouse Subsidiaries Merged Into Parent Company

Westinghouse Electric & Manufacturing Company announces the discontinuance of the corporate form of two subsidiaries by consolidation into the parent company. These concerns are the Westinghouse Electric & Products Company of Mansfield, Ohio, and the George Cutter Company of South Bend, Ind. In future they will be designated as the Mansfield works and the street lighting department, respectively, of the Westinghouse Electric & Manufacturing Company. The latter includes the South Bend works, which is one of the largest in the country devoted to the manufacture of street lighting equipment, with branches for the manufacture of poles located in Milwaukee, St. Louis, and Valdosta, Ga.

Long Island Railroad Opens New Double-Track Line

Officials of the Long Island Railroad announced the completion on Jan. 5 of double track on the Long Beach Division between East Rockaway and Wreck Lead, a distance of 3.37 miles. The work involved laying a complete single track and, in addition, 150-lb. third rail. The project cost approximately $500,000. Power for the line is being supplied from the existing substations at Wreck Lead and Lynbrook. Service was commenced immediately following the announcement.

General Electric Recalls G. E. Emmons

At a recent meeting of the board of directors of the General Electric Company, G. E. Emmons, for many years in charge of the manufacturing organization and since 1924 retired, was elected acting vice-president, due to the illness of F. C. Pratt. In addition to being in charge of the manufacturing organization, Mr. Emmons was for years Schenectady works manager. At the same meeting E. W. Allen, formerly manager of engineering, was elected vice-president in charge of that activity. The promotions were effected as of Jan. 1.

Rolling Stock

Hamilton Street Railway, Hamilton, Ont., Canada, expects delivery in May, 1927, of 24 single-end, semi-convertible street cars, ordered Nov. 12 from the National Steel Car Corporation, Ltd., also of Hamilton. The units will be of semi-steel construction, steel frames and steel girder plates for the inside side finish being specified, while the outside sheathing below the windows will be of ¼-in. Plymetl. Seats for 48 passengers will be provided, these to be upholstered in genuine Spanish leather. Following are the principal specifications:

Weights:	
Car body	19,000 lb
Trucks	8,000 lb.
Equipment	7,000 lb.
Total	34,000 lb.
Bolster centers, length	18 ft. 2 in.
Length over all	40 ft. 11 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3¼ in.
Height, rail to trolley base	10 ft. 9¾ in
Body	Semi-steel
Interior trim	Cherry
Headlining	Haskelite
Roof	Arch
Air brakes	Westinghouse
Axles	4-in. steel
Bumpers	Anti-climber
Car signal system	Consolidated Car Heating Co.
Center and side bearings	Perry-Hartman ball bearings
Compressors	Westinghouse
Control	K-35
Couplers	Emergency
Destination signs	Hunter
Door-operating mechanism	National Pneumatic Co.
Fare boxes	Cleveland
Fenders	H-B life guard
Gears and pinions	Helical
Hand brakes	Peacock Staffless
Heater equipment	Consoliated Car Heating Co.
Headlights	Golden Glow
Journal bearings	Friction
Journal boxes	MCB
Lightning arresters	Westinghouse
Motors	510-A-2 Westinghouse interpole, inside hung
Paint	Duco
Sanders	O. W. Meissner's
Sash fixtures	O. M. Edwards
Seats	Ottawa Car Company
Seating material	Spanish leather
Slack adjuster	Westinghouse
Springs	Coil and elliptic
Step treads	Irving Subway
Trolley catcher	Ohio Brass
Trolley base	U. S. No. 13
Trucks	National Steel Car
Ventilators	Nichols-Lintern
Wheels	26-in. rolled steel
Special devices, etc.	Westinghouse treadle step, automatic air control

Philadelphia, Pa. — Westinghouse Electric & Manufacturing Company was recently awarded two contracts for electrical equipment for the Broad Street subway cars, aggregating $1,182,148. Twenty of the 312 car motors included in the contract must be delivered by April 30 and all must be turned over to the J. G. Brill Company by Sept. 15. Incidentally, Director Ehlers of City Transit expects that the subway will be officially opened by Mayor Kendrick early in November.

Indianapolis, Ind.—Arthur W. Brady, president of the Union Traction Company, recently outlined before the Public Service Commission plans for the purchase of new rolling stock to be used in the company's freight business. Mr. Brady sought the commission's approval of a proposed issue of $62,235 in notes to buy twenty new freight cars. The purchase is to be made on the basis of a $6,000 payment and the balance in monthly installments of $1,035.27.

New York City.—The New York Railways is planning the rehabilitation of 115 cars. They will be rebuilt along the lines of the trial cars concerning which articles have already appeared in the JOURNAL.

Union Traction Company of Indiana, Anderson, Ind., according to reports, has requested permission from the Public Service Commission for the issuance of notes to buy twenty new trail freight cars for $68,235. Terms of the proposed purchase are said to be $6,000 cash and the balance in 60 monthly installments.

Trade Notes

Elisha Walker, president and chairman of the board of Blair & Company, New York City, has been elected a director of the American Brown Boveri Electric Corporation, to fill a vacancy, and Henry Lockhart, Jr., vice-president of the same company, has been elected to succeed Felix Jenkins, resigned.

Service Motors, Inc., Wabash, Ind., will be amalgamated with the Commerce Motor Truck Company of Ypsilanti, Mich., for the purpose of manufacturing buses and trucks to be equipped with the new type of final drive known as the relay axle drive. E. W. Bassick of Bridgeport, Conn., with several associates, has been active in effecting the amalgamation. G. L. Gillam, president of Service Motors, Inc., will be an officer of the new corporation and have active charge of the operation of the business. W. R. Bassick, president of the Commerce Truck Company, will be an officer and director of the corporation and will be actively interested in the new business. M. A. Holmes, for a number of years sales manager of the Republic Truck Company and now sales manager of the Commerce Truck Company, will be in charge of sales. The headquarters of the new corporation will be at the service plant at Wabash, which is one of the best designed truck manufacturing plants in the country.

Samuel M. Vauclain, president of the Baldwin Locomotive Works, looks for modest business in 1927, with operations running to 50 per cent of capacity. He expects all departments will be moved to Eddystone, Pa., by the end of 1927 and again denies the report that negotiations are under way for the sale of the Philadelphia property. Gross sales of 1926 are estimated at $47,000,000, against $27,876,064 in 1925.

Metal, Coal and Material Prices

Metals—New York	Jan. 4, 1927
Copper, electrolytic, cents per lb.	12.90
Copper wire, cents per lb	15.25
Lead, cents per lb	7.725
Zinc, cents per lb	7.25
Tin, Straits, cents per lb	66.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.125
Somerset mine run, Boston, net tons	2.45
Pittsburgh mine run, Pittsburgh, net tons	2.125
Franklin, Ill., screenings, Chicago, net tons	1.875
Central Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.00
Weatherproof wire base, N. Y., cents per lb.	17.50
Cement, Chicago net prices, without bags	2.10
Linseed oil :5-bbl. lots;, N. Y., cents per lb.	10.8
White lead in oil :100-lb. keg:, N. Y., cents per lb	14.50
Turpentine :bbl. lots;, N. Y., per gal	$0.89

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued folder 4474, describing the babbitting of bearings and explaining the use of the Westinghouse automatic electric babbitting pots. The folder describes also the lead base babbitt, alloy No. 25, a product of the Westinghouse company.

Ohio Brass Company, Mansfield, Ohio, in a recent circular announces a new welding device, designated as the O-B portable resistance welder. The device is of unit type construction and specially designed to operate at high temperatures, with repeated heating and cooling, and without any injurious effects.

Armco Culvert & Flume Manufacturers' Association, Middletown, Ohio, has published a bulletin entitled "Applying Culvert Simplicity to Highway and Railway Bridge Problems." This booklet discusses various angles of culvert and bridge construction and points out the simplicity with which installations of large diameter Armco culverts to the crossing of small streams may be made. Various types of stream crossings and drainage problems are discussed and a table is included to assist in determining the size of culvert required in any given case. Copies of the booklet may be obtained from the Armco association.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, January 15, 1927 *Number* 3

In Helping One's Neighbor One Will Help Himself

SOME master mechanics appear to have a tendency to withhold from visiting master mechanics vital information pertaining to maintenance methods and practices being followed daily within the shop. This is a state of mind that never should exist. These same indifferent master mechanics when visiting the shops of other properties expect an open and frank outpouring of information with respect to the practices being followed—and if this is not forthcoming they feel very much offended.

At varying intervals throughout the year the managements of various companies expect their master mechanics to visit the shops of other properties to discuss maintenance problems and to obtain first-hand information regarding the maintenance practices being followed. Usually these visits prove beneficial, not only to the visitors but to the visited master mechanic as well. The discussion and exchange of ideas give birth to new ideas, resulting in a betterment of maintenance practices with lowered costs. Sometimes, however, little or no benefit is derived from these visits. This is the case when the master mechanic of the visited property will not show his goods in an open, frank manner and the information received by the visitors is obtained only by constant questioning and sifting out the short, curt or evasive answers.

What is the cause of this attitude? Perhaps the offender does not care to impart knowledge to other properties relative to his practices or he does not consider his methods as good as those being followed on other properties. Whatever the reason for this attitude, it should be changed. The sooner this is done the better it will be for the entire industry. It is only through the free and constant exchange of ideas on maintenance methods and practices that progress can be made.

So the Newspapers and the Public May Know

CERTAINLY reassuring is the statement to the press of Managing Director Storrs in review of the electric railway situation for 1926, released for publication on Jan. 10. There appears to be no need here to refer to all that he said, since some of the statistics have heretofore been matters of industry record, but it does seem well to reiterate that the gradual increase in traffic in the industry as a whole stood out in marked contrast to every other year since the war.

Particularly significant is his reference to the extent to which co-ordination is being carried out, the best part of which is the implication the statement carries of the readiness of the railways to do their share. It may even have escaped railway men that more than 7,000 buses now are being operated by approximately 275 electric railways over more than 15,000 miles of route. A doubter here and there may be inclined to scoff, but it remains significant, however, that, due to the joint effect of an increase in traffic and an increase in the average fare, the gross receipts of the industry have risen during 1926, an advance not offset by the increase in expenses. Mr. Storrs says quite frankly that the future of the small city railway is still a problem and that some interurbans, which never should have been built, are not doing so well.

It was very much to the point for Mr. Storrs to indicate that outstanding problems of the industry are traffic congestion, which slows up cars; taxes, which are the highest imposed on any industry in the world, and the increase in the use of the private automobile in daily business. He is correct when he says that managements generally are approaching these problems progressively. They are effecting operating economies, using paid advertising and other proved forms of salesmanship, and on the whole are confident of the future.

Nothing but good can ever come from the reiteration of the facts of the industry as Mr. Storrs has made them available to the newspaper reading public of the country.

Many Special Machine Tools Being Built

INCLUDED in the equipment of the department of electrical repairs of the new Coney Island shops of the Brooklyn-Manhattan Transit Corporation's lines, as discussed in this and the Dec. 18, 1926, issue of ELECTRIC RAILWAY JOURNAL, are a number of new universal machine tools. These permit the performance on an armature, without removing it from the machine, of several operations, such as banding, turning, slotting and finishing of commutators and truing up of shafts. The turning of new armature shafts is done in a multiple carriage lathe with several tool posts on each carriage.

This tendency toward the production of special machine tools was commented upon by the machine-shop practice division of the American Society of Mechanical Engineers in a report presented at the annual meeting in December, 1926. Builders of standard equipment are fitting their machines with attachments particularly needed to do some special job, and in addition a great many purely special machine tools are being built. Some examples given were the multiple-spindle drillers and multi-head millers. In some cases machines are

This is the issue in January that is devoted essentially to maintenance and construction subjects

supplied which employ standard heads and parts, but in other respects the construction is special. Hydraulic feeds have been included in new machinery by several designers. In some types the power is supplied to the hydraulic cylinders in the machine by oil under pressure from an accurately controlled pump.

In the review of machine-shop practice there appeared a direct tendency toward increased use of individual motor drive. Practically every machine-shop tool now built is provided with motor drive, or at least has it as optional equipment. This applies to small machines such as drillers, tappers, etc., as well as to the larger units. Motors are being designed as a part of the machine tool rather than being added as an afterthought, and in some types motors are built directly on the spindles or are geared directly to them.

Another tendency in machine-tool manufacture is toward better bearings. Ball and roller bearings are being employed more than previously. They were used first successfully on intermediate shafts, but now their application is extending to main spindles. Improved lubrication is another feature. Flood lubrication by pump or splash is the rule in the latest type lathes, drillers, milling machines, etc.

In new models of machine tools considerable attention has been given to their control and to facilities for chucking and feeding. These include fast table movements on milling machines, treadle control of workheads on grinders, push-button control and the bringing together of all control handles within easy reach of the operator.

Knowledge of Improved Methods Needed by Electric Railway Shopmen

QUITE generally it has been considered that the work of car inspection does not require highly skilled mechanics. To a certain extent this is true; a considerable part of it can be done by semi-skilled labor. But experienced mechanics and electricians with previous knowledge and actual training enabling them to determine when work is done properly will prevent many failures of equipment, thus forestalling annoying delays and expense. If a check be made of the average force employed in the inspection of cars few men will be found who have served an apprenticeship at a regular trade. Usually a man has drifted into a railway shop and been put to work as a helper. By sticking to the job, principally because it was a job, he progressed to the position of repairman or gang leader. Having learned the work from the men he helped, if this was done wrong the errors have continued.

To those who have investigated the matter it is apparent that more attention should be given to instruction and training of electric railway shopmen. Employees in subordinate positions must be given an opportunity to secure all possible information about the work they are doing and foremen must be made familiar with the best practices of other shops. Executives and men in the more important positions should be made to understand the necessity of supplying to the men who are actually doing the work information regarding desirable practices. They should also be led to think for themselves and to devise improved methods for doing the work better.

Training of apprentices is another phase of the improvement work that should receive attention. Some of the larger railroad companies have established apprenticeship courses. On the New Haven railroad helper apprentices are recruited from the force of helpers who have already served two years with the company in that capacity. Simple but thorough examinations are given regularly to show the amount of advancement that is being made.

Shop methods, processes and the tools used for the repair of car equipment become obsolete in time. There is a wide field for modernization in electric railway shops. Much of the need has come from the attitude toward the shop employees that has been discussed. So, on the other hand, a plan that will give a modern frame of mind to the workman is an essential factor that must go along with or even precede the physical modernization.

Increased Maintenance Expense May Come from Unexpected Sources

LACK of business intimacy between heads of departments and their subordinates, as well as between heads of departments in general, invariably is a fundamental cause of unpleasant working conditions, undesirable friction, and finally a tremendous financial loss to the operating organization. This is often caused by petty arguments, jealousies or the unwillingness of foremen or department heads to assume responsibility for faulty workmanship or failures.

All this has a far-reaching effect. It not only hampers production but results in the production of materials of a quality inferior to that required and at a greater expense. Increased road failures result, with corresponding delays, loss of public confidence and reduction in revenue. This condition cannot be corrected until every employee of the railway recognizes that he has a personal interest in the success of every other member of the organization. Without this mutual understanding the industry cannot grow. When some member stands back and refuses to co-operate with his fellow worker in the performance of his duties, or the advancement of modernization of ideas or methods, then this individual acts as a retarding force and tends to slow up the progress of the entire organization.

As an illustration, consider one specific instance. The machine shop and the controller shop of a certain property are each headed by a foreman reporting to the superintendent of equipment, so that the two departments are independent of each other. To effect a saving in material, the controller shop foreman decided to cut down certain burnt controller segments in order to permit of their use in positions where shorter segments were needed. This work was being performed in the machine shop. Due to the tactics used by the controller shop foreman, the machine shop foreman was offended and as a result he refused to perform the work. Not wishing to intensify the existing hatred, the controller shop foreman for the time being abandoned the use of reclaimed segments and set about to manufacture a machine capable of cutting off and rebuilding the segments as was done in the machine shop.

What was the result? He had shown a material reduction in cost due to this reclaiming process and naturally did not want to go back to the use of new material, on account of the expense it would entail. Since he did not have any other way to keep the cost down while he was experimenting with the new machine, he was tempted to stop removing the burnt segments for the time being as had been done previously. As a result there was a far greater expense on account of a large increase in road failures.

When the machine finally was constructed he was able to recondition the segments in his own shop. But the device developed by him was extremely crude and the cost of manufacture was exorbitant, as compared with what it should have been had he used a new machine readily procurable in the open market.

This one instance of lack of understanding certainly bred a great deal of trouble and tremendous expense. All this could have been avoided had the proper means of reconciliation been provided.

Public Utility Success Needs Good Faith of the Public as Well as of the Utility

LOCAL transportation service in Newark, Ohio, was shut down a number of months ago after the City Council repudiated its own grant of a new franchise to the railway by giving paralleling rights to an independent bus concern. This last move came after the Southern Ohio Public Service Company in good faith had purchased the old set of competing bus lines as a part of the unification and modernization plan for the improvement of the property.

The outcome as it stands to-day is far from representing the will of the people. When the company announced that it would suspend service as of midnight, Aug. 10, 1926, following the granting of the competing bus franchise, mass meetings were held, and since then the business men of the city have tried in many ways to undo the damage. It has been found, however, that the bus franchise is as valid as that which was granted to the electric railway, and the Southern Ohio Public Service Company has quite properly refused to sustain the further losses resulting from operation on a competitive basis.

Just 60 miles to the east lies Zanesville, only slightly larger in population than Newark, and heretofore served by the same company that also operates interurban and coach service between these cities and Columbus. Even before the fiasco in Newark, Zanesville had passed a modernized ordinance extending the franchise to the Southern Ohio Public Service and that company had proceeded with the rehabilitation of track and had purchased and placed in operation 20 modern and finely appointed cars and several high-grade buses to serve newly developed territory. The same general plans were offered to Newark, so that there were no grounds for doubt as to the integrity of the company. Zanesville had solved its problem months before Newark upset hers.

The Newark situation was discussed in this paper last August. It is brought up to date elsewhere in this issue. Later developments indicate but little change and it appears that *finis* is to be written to the street railway history of Newark. Through hasty and unwarranted action, upward of a million dollars has been sacrificed to the political selfishness of the clique in power. The clique will soon be forgotten, but the black mark against industrial integrity on the city will be a heritage that will long remain.

Off-Street Parking Facilities Must Not Be a Subsidy

STUDIES by Dr. Miller McClintock, director of the Erskine bureau, reveal the woeful inadequacy of curb space for parking purposes. In Chicago, on the basis of a 100 per cent turnover every 30 minutes, only 15 per cent of the automobiles that daily enter the loop can be accommodated in the Loop district even for so short a time. What is true of Chicago, as shown by the survey of the Chicago Association of Commerce presented in the Jan. 8 issue of the JOURNAL, is likewise true of other great cities as well.

On the other hand every railway man knows the tremendous hindrance that this parking evil creates to all manner of moving vehicles. It is the direct cause of slowing up moving traffic not only of automobiles but, more important, the mass transportation vehicles as well. Merchants, due to erroneous assumptions, have long felt that parking facilities in front of their respective business establishments have been a drawing card to prospective patrons. This recent finding on the part of the Erskine bureau in the light of studies recently made in Chicago, Cleveland and other cities attaches less weight to this mistaken theory.

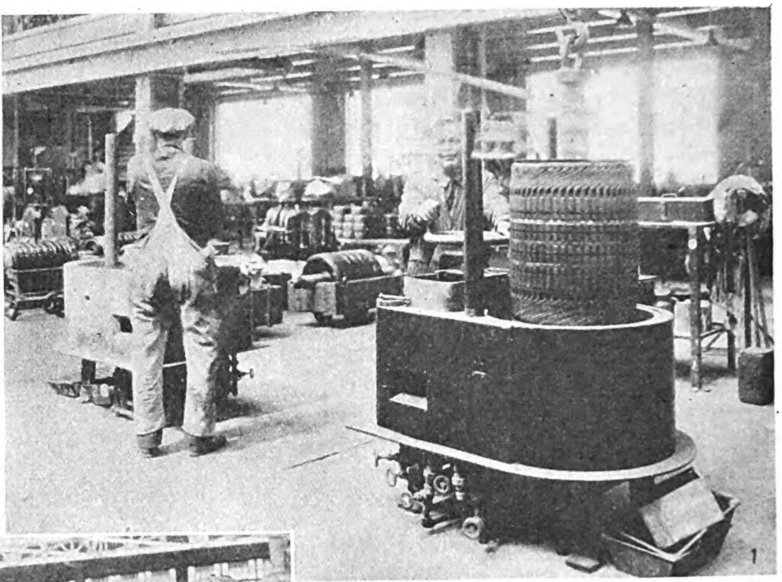
When it is realized more fully that this accommodation of the few is of such disproportionate value to the service of the many, still less value will be attached to street parking facilities. With the full width of busy streets available for moving vehicles, mass transportation could be improved in speed and in this way perform a service to a far greater number of people than is possible at present.

To this end the suggestion of Dr. McClintock, detailed elsewhere in this issue, to provide convenient off-street storage areas is of great value. An element of possible danger, however, arises from the suggestion that such storage facilities be constructed from public capital and charged for at reasonable rates. The possible idea must not be tolerated that such rates can be anything less than the full cost of providing such accommodations. The free use of the streets for parking purposes existing for so many years may well lead to the thought that the storage of private cars in garages erected out of public funds should be a partial gift to the public. Such a condition would be only a subsidy to the private automobile owner and would be directly unfair to the riders on electric railways. In most cities the car riders not only do not enjoy a subsidy, but actually subsidize the city in providing street paving and other forms of taxation that are of no direct benefit to the car rider. In Chicago, for example, the public improvements paid for by the Surface Lines riders have amounted to $100,000,000 in 20 years.

Depending on its value the land used for car storage buildings will be worth from $1 to $5 per square foot annually. Assuming that a car will require at least 100 sq.ft. for storage, aisle and ramp space, this will entail a charge of $100 to $500 per car annually.

All that the electric railway may expect is fairness. The industry today is competitive, although all too few realize this condition. The operations of the companies in city streets are hampered to an ever-increasing extent by the pitiful few who are benefited by curbstone parking. A ban on parking will allow a distinct improvement in service, but the railways must resist, as taxpayers, any attempt to provide this relief at public expense.

Modern Machines Facilitate Maintenance Work in New Shop for Brooklyn-Manhattan Transit Lines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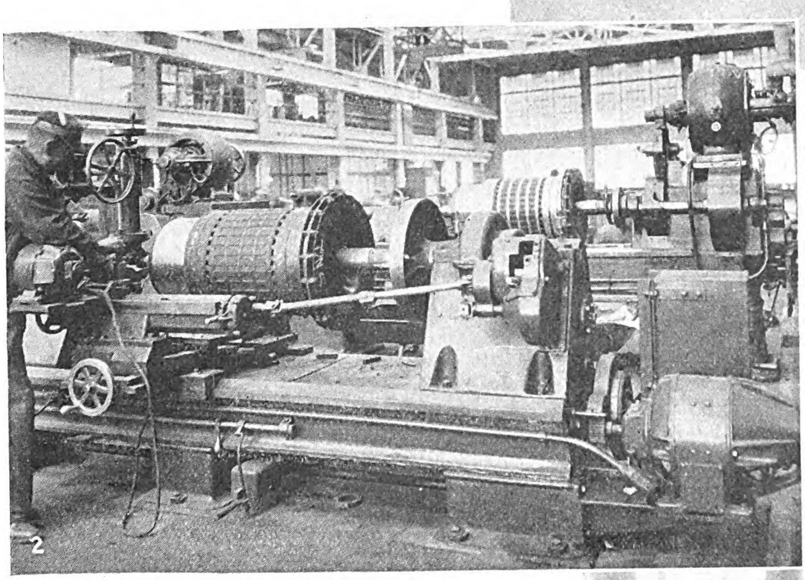
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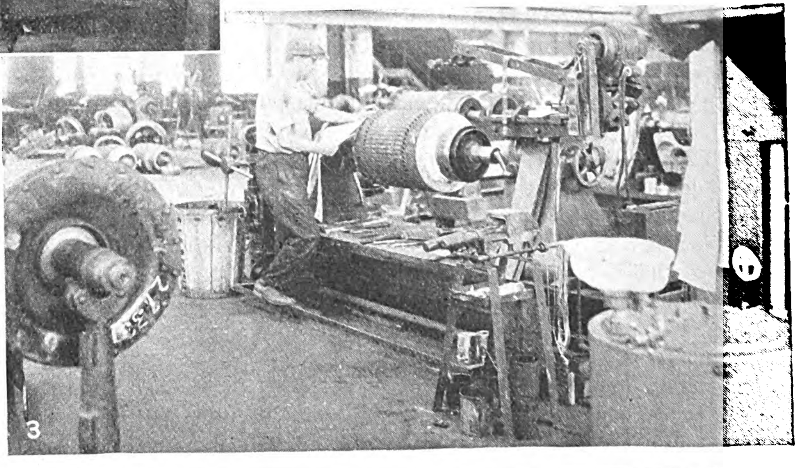
No. 1. Dipping armatures in soldering pots to solder connections at commutator neck.

No. 2. Banding, slotting and turning operations can all be done in these universal lathes.

No. 3. Applying canvas hood to the pinion end of armature windings.

No. 4. Slotting a commutator by means of an individual slotting machine.

No. 5. Commutators are trued up by taking a slight cut and are then sandpapered and polished.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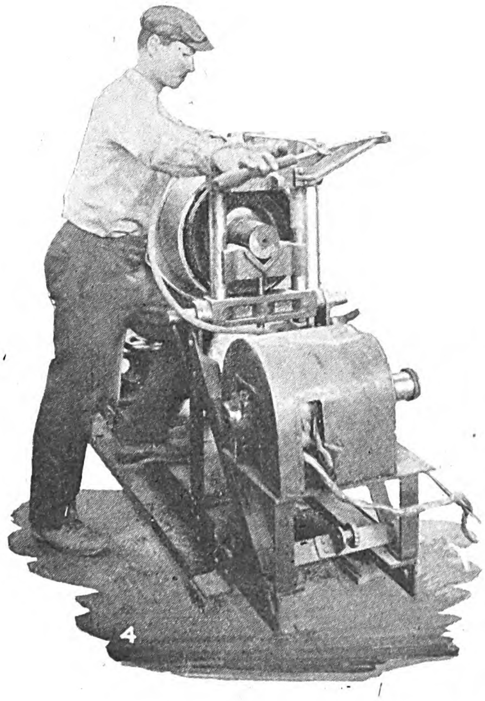
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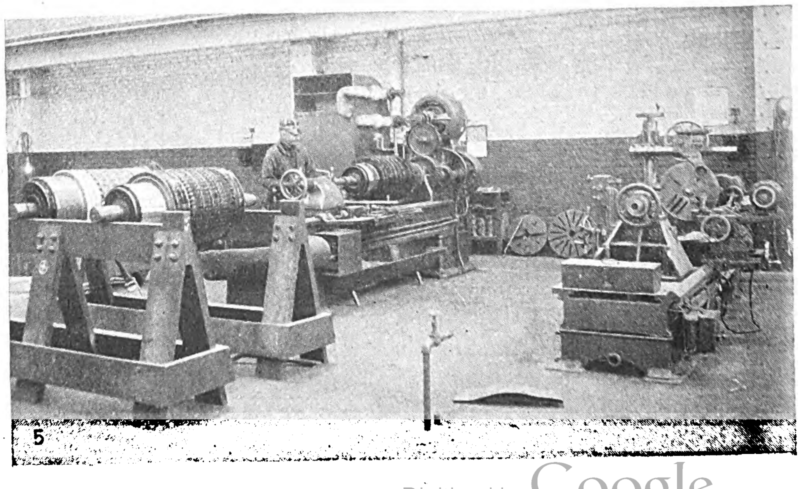
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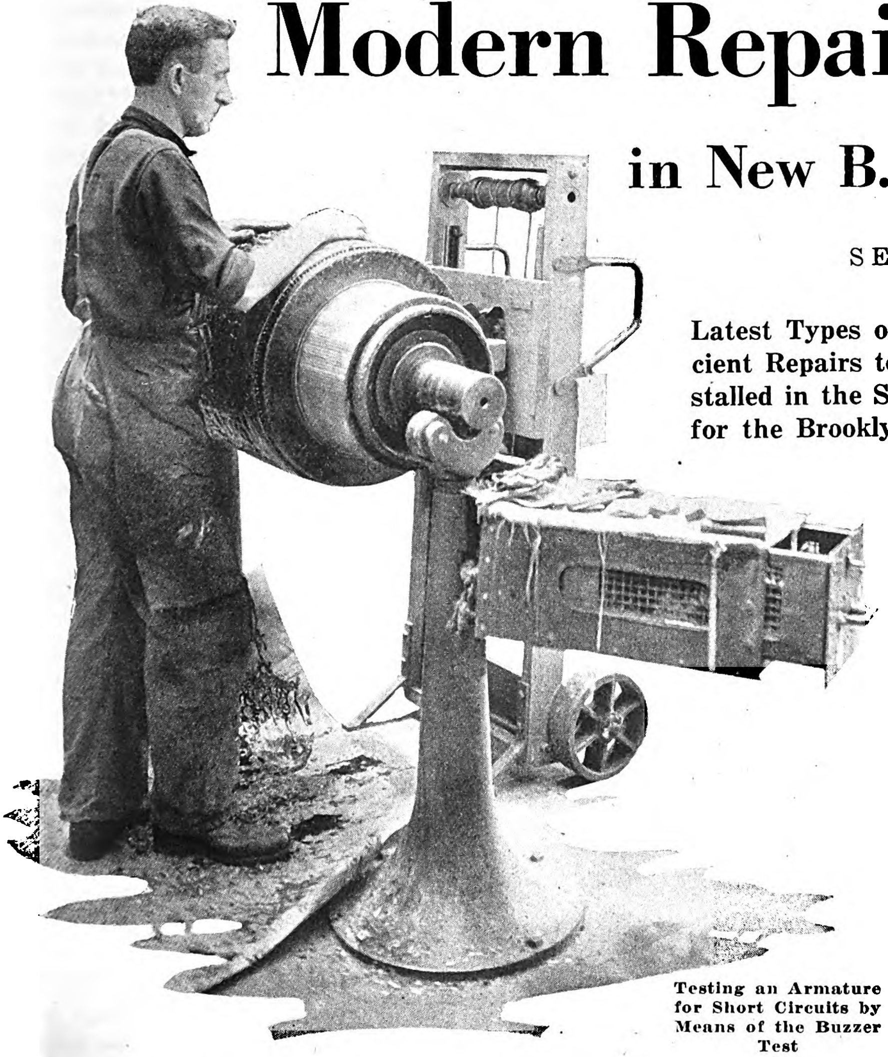
Modern Repair Methods

in New B.-M.T. Shop

SECOND ARTICLE

Latest Types of Tools to Insure Rapid and Efficient Repairs to Electric Car Equipment Are Installed in the Shop Devoted to Electrical Repairs for the Brooklyn-Manhattan Transit Corporation



Testing an Armature for Short Circuits by Means of the Buzzer Test

SELECTION of the best available practices for repairing electrical equipment of cars has made the new shop of the Brooklyn-Manhattan Transit Corporation outstanding. Devices have been installed to do the work quickly and with a minimum of physical effort. While many of the pieces of apparatus are fairly common in large railway shops, the combination of them in one carefully planned layout is unique. For this reason considerable attention has been given in this article to a discussion of the individual tools and devices.

Armature leads are connected to the commutator bars by the pot-soldering method. All oil, dirt, insulating material and paint are removed when the commutator is repaired and the slots in its neck are cleaned and carefully tinned before the coils are inserted in them. The soldering is done in two General Electric soldering pots installed in section 6 of the shop, which has a concrete floor. Provision is made for two additional pots.

The soldering pots, two of which are shown in the illustration on page 108, are standard equipment in a number of large shops. There are two compartments side by side, one in which the soldering is done and the other a reservoir in which the solder is kept molten by gas flames. The soldering compartment has a hollow center in which the commutator is placed, so that it projects below the solder and does not come in contact with it. A sheet metal ring laid on the opening in the center has a hole of such diameter that it just lets the commutator pass through. A collar of asbestos tape placed around the commutator about 1 in. from the neck makes a solder-tight connection. The space between the asbestos collar and the neck is painted with a mixture of whiting and alcohol to prevent the solder from adhering.

The armature is handled by means of a crane, a hook fastened to the pinion end holding it vertical with the commutator end down. It is placed in position in the pot and then the solder is forced around the neck by depressing a plunger in the reservoir. While the solder is around the commutator the neck is raked with a wire brush to insure good contact and union of the solder and copper. After several minutes the hot solder is drained from the central portion by raising the plunger in the reservoir and the armature is removed. With the pot method of soldering the leads of an entire armature can be soldered in one operation, without danger that any excess solder will work back of the commutator neck.

The frequency with which an armature is tested was detailed in the previous outline of armature work. Three types of testing apparatus are used, the bar-to-bar test equipment, the high-voltage test and the buzzer test.

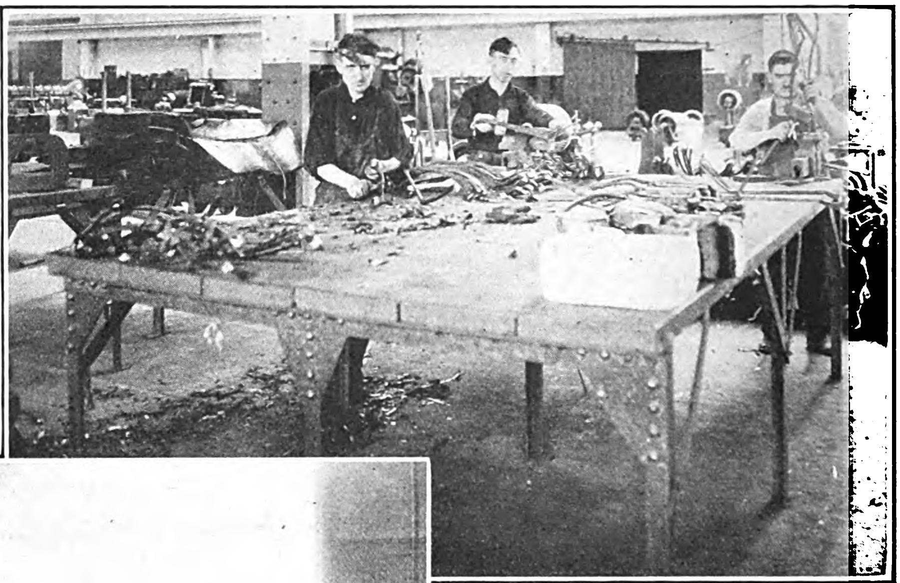
Two types of bar-to-bar test equipment are used. One has a variable resistance and the other a lamp circuit. In either case an ammeter is connected in series.

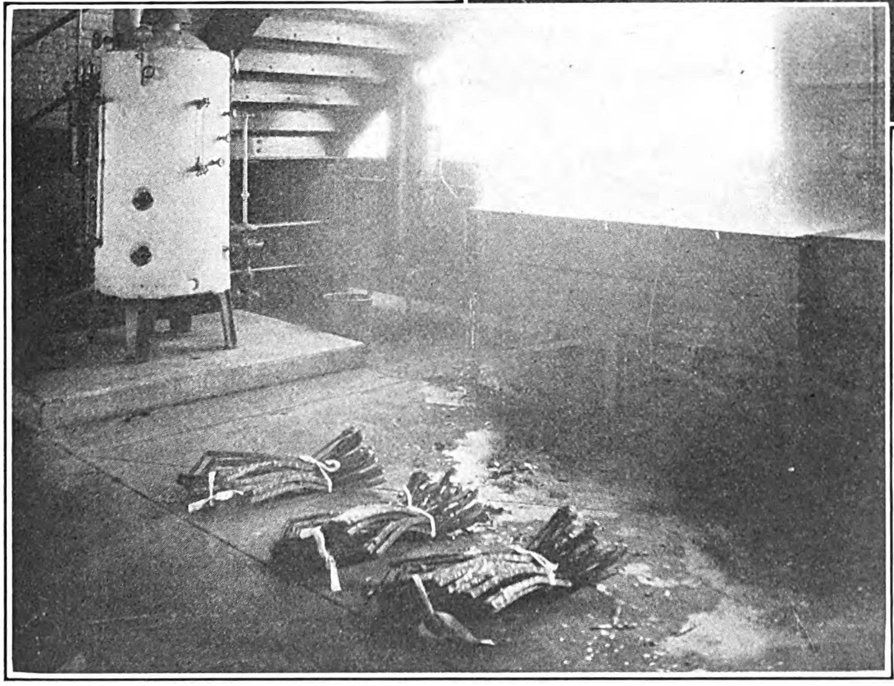
THE first article on the new electrical repair shop for the Brooklyn-Manhattan Transit Corporation's lines was published in ELECTRIC RAILWAY JOURNAL for Dec. 18, 1926. It contained information on building, construction, size, lighting, heating, arrangement of departments, plan for routing work, equipment cleaning methods, ovens for drying and baking and vacuum impregnating methods. In this, the second and final article on the electrical repair shop, various departmental operations are discussed, such as testing, soldering, banding, turning, slotting and polishing of commutators, general machine work, locker and washroom conveniences for employees. Articles relating to the other shops which will compose the Coney Island group will be published as soon as the remaining buildings are placed in service.—EDITOR.

Leads placed on two adjacent commutator bars are used to explore the coils and locate trouble, a millivoltmeter giving the indication. The 600-volt shop system is used as the source of supply. High-tension tests are made by the portable transformer box already referred to.

The buzzer test to detect short circuits and grounds is made with standard Westinghouse Electric & Manufacturing Company equipment. This consists of a laminated iron core in which an alternating magnetic flux is set up. The exciting coil is energized from the shop a.c. circuit. The core is mounted on a wheeled stand which readily can be moved up to an armature undergoing repair and on which the tests are to be made. A windlass permits of raising or lowering the cross head which supports the laminated core so that it can be shoved against the armature as it rests on the usual type of winding stand. In this position, with the laminated core energized an alternating flux passes through the armature. If the condition of the armature winding is correct the electromotive forces generated counterbalance each other and no current passes through the winding. A short-circuited or reversed coil will cause a local current and a flux around the slot in which the coil lies. A piece of metal or a knife blade passed around the commutator will then short-circuit in succession each of the coils that have one side under the testing pole. If there are no faults in the winding a decided spark occurs as the knife blade leaves each bar. Absence of spark between two bars indicates a short circuit, an open circuit or a reversed coil in the winding.

A short-circuited or reversed coil due to the local current induced in it will generate a flux, which can be detected by moving a piece of sheet iron held lightly over the surface of the armature core so as to bridge from one tooth to the next successively. The local flux caused by a short circuit or reversed connection will attract the piece of iron when it bridges across the slot containing the defective coil. As the sheet iron is thus caused to vibrate the test has been termed the "buzzer." If no local flux is detected the fault disclosed by the sparking test is due to an open circuit. This testing equipment is suitable only for use with wave-wound (two-circuit) armatures, as the equalizing connectors on lap or multiple-wound armatures would make the entire winding appear short circuited.





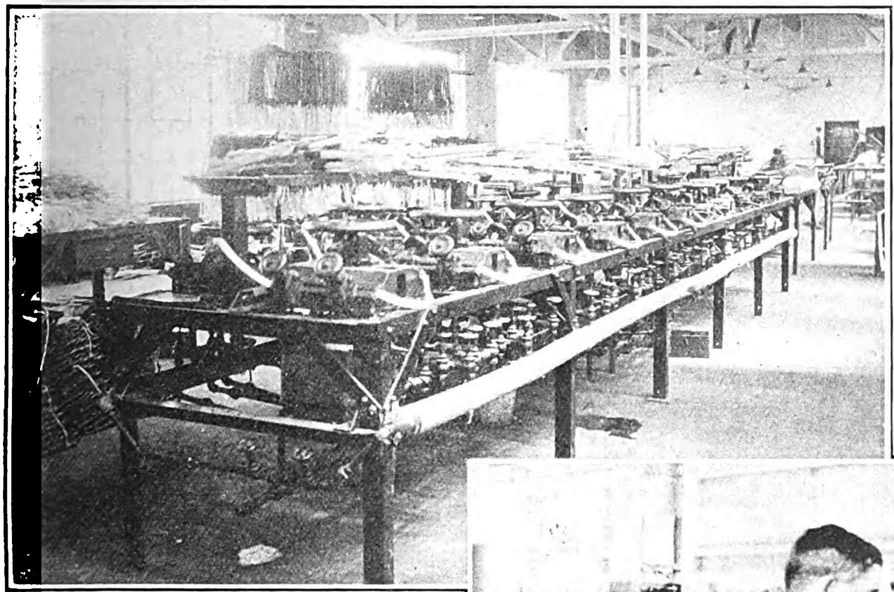
Above—Removing Insulation and Straightening Armature Coils

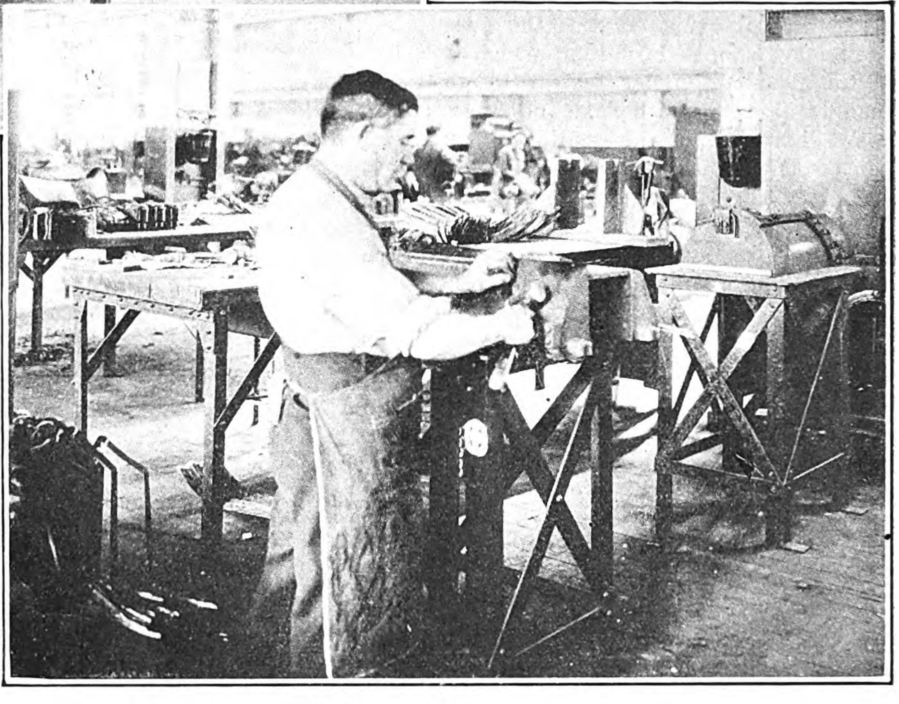
At Left—Strap-Wound Armature Coils Are Tied in Bundles Convenient for Handling and Are Placed in a Lye Tank for Removal of the Insulation. The Solution Is Heated by Steam from a Flash Boiler

For testing equipment the shop is wired for 110 volts alternating current, with outlets in the pedestals of the armature winding section and at other convenient intervals. The alternating current is supplied by a General Electric synchronous converter, installed together with the necessary switchboard equipment at one side of the shop adjacent to the office.

Banding of armatures and turning and slotting of commutators are done in section 7, which is equipped with four special lathes. One of these is a Peerless universal slotting, banding and commutator turning lathe. There are also two Le Courtenay combination banding and turning lathes, one of which is equipped with a commutator slotting attachment. The fourth lathe of this group is a small Peerless slotting and banding lathe, which is used for small armatures such as are used for air compressors. The banding equipment also includes a separate band tension machine made from General Electric Company's design by the railway, which provides for accurately weighing the tension used for banding. With the large size subway motor armatures such as are used by this company, a banding tension of 400 lb. is required. These machine tools are designed particularly for electric railway work and the economy of being able to do banding, commutator turning, commutator slotting and, in fact, all machine work on an armature in one set-up will be appreciated by railway repairmen.

For turning shafts already installed in armatures and for cutting threads on the end of the shaft for the pinion nuts a 26-in. lathe made by the Monarch Machine Tool Company is used. This size is needed in order that the lathe carriage may pass underneath the commutators of the large armatures. This lathe can also be used for turning commutators if the volume of work makes it necessary.





Above—A Large Number of Hot Presses Are Used for Armature Coil Work
At Right—Shaping Coils for Reinsulation

An 8-in. Lo-Swing lathe is used for turning new armature shafts and also for turning the tapers on armature shafts. This lathe has two carriages and two tool posts per carriage. All work on an armature shaft can be done in this lathe except the cutting of threads and keyways. Two machines are provided for keyway work, one a No. 3 Little Giant horizontal key seater and the other a No. 5 vertical key seater. The vertical key seater is used for cutting keyways inside armature spiders and in other places where the keyway is inside an opening. In the table of machine tools now installed in this shop will be found listed several other machines necessary for various repair operations and for keeping the cutting tools in proper condition.

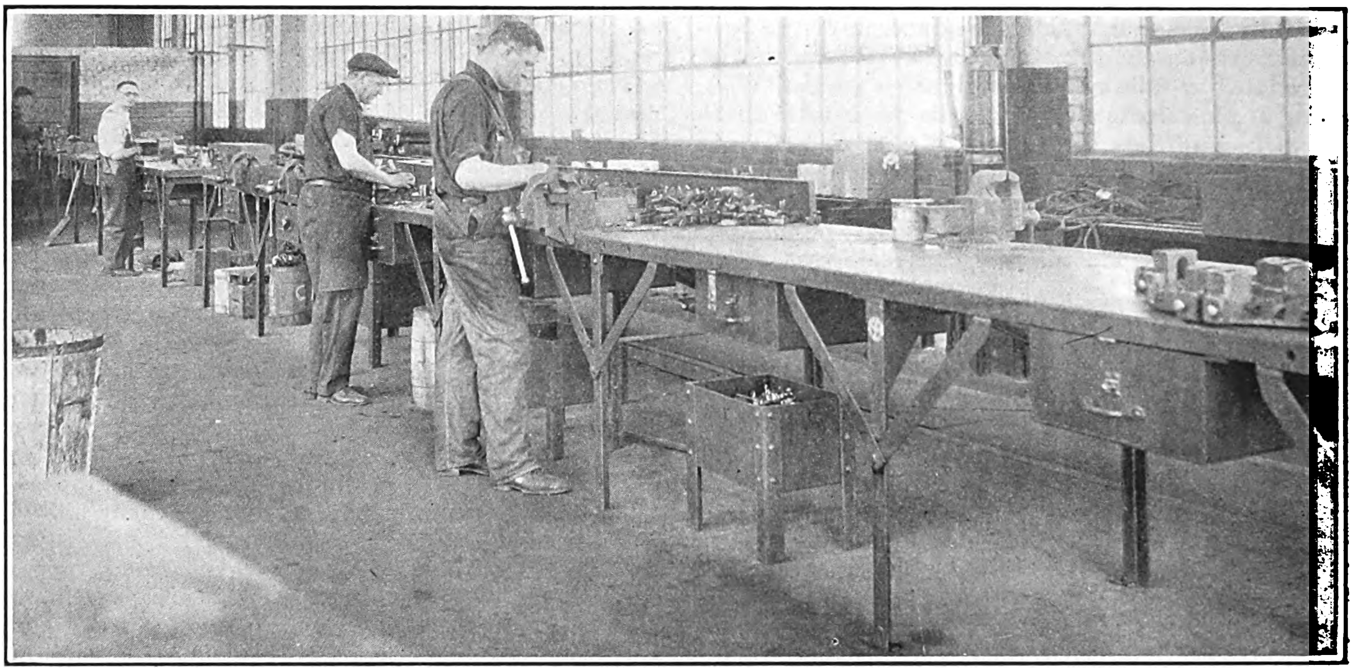
All of the armatures used in rapid transit service for the New York Municipal Railway Corporation have strap-wound coils. After removal from the armatures the coils are taken to section 8 for reclamation. The first operation is removal of the insulation. The coils are bundled up in lots convenient to handle and are put into the potash tank. After immersion for two or three hours, the coils are taken out and one edge of the softened insulation is cut off. They are then returned to the potash tank and left overnight. The insulation can then be scraped off with a knife. After washing, the coils go to a bench for shaping, care being taken not to separate the three coils which go together in winding.

The potash tank is made of sheet steel with a frame and supporting legs of angles. It is 6 ft. long, 30 in. wide and 18 in. deep. Steam pipes are run around the inside of the potash tank. The solution that is used in this tank when put in fresh is made with 6 lb. of potash to 50 gal. of water. The solution is continued in use by adding 1 lb. of potash each day. A small washing tank, 28 in. x 18 in. x 10 in. deep, is provided at one end of the potash tank. The lye solution is kept hot by steam from an 8-hp. flash boiler, manufactured by the P. M. Lattner Manufacturing Company. Steam from this boiler is also used for the hot coil presses installed on the balcony in section 14 immediately above the boiler. This boiler burns gas at a low pressure, regulated automatically to keep the steam pressure at 60 lb.

There are several operations in the straightening of the armature coils. The leads and sides of the coil are straightened in a vise and they are brought back to their original shape by placing them on forms and hammering with a wooden mallet. It is also necessary to remove carefully any rough spots and sharp edges, after which the coils are retaped and are then dipped and baked for reuse.

FIELD COIL TEST METHODS

Section 14 of the shop is also used for all field coil repairs, which consist mostly of putting on new insulation and new leads, which are placed on all coils which come in for repairs. After repair, each field coil is given a short-circuit test. In this the field under test acts as a secondary of a transformer, the primary coil of which has a circuit breaker, ammeter and a double-pole, single-throw switch. In making the test, a reading is taken on the ammeter and the switch is closed with-



Section Devoted to Controller, Switch Group, Brush-Holder and Other Detailed Equipment Repairs

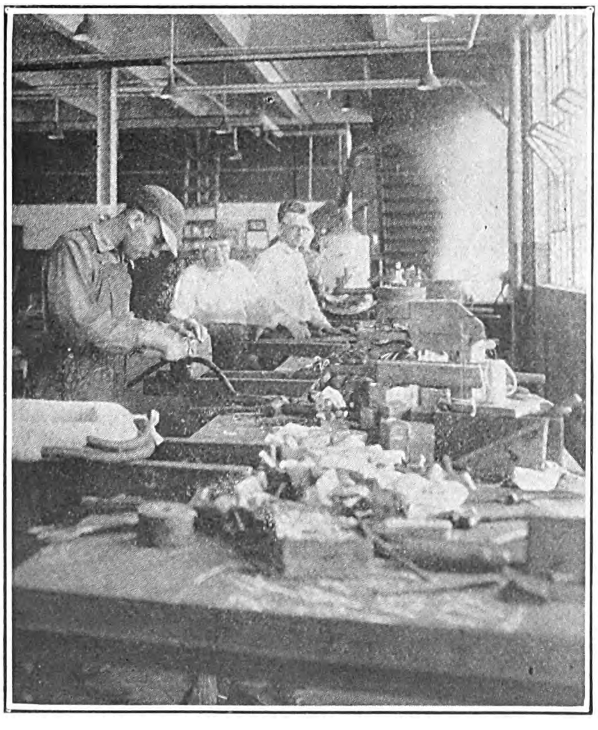
out a field coil in position for testing. This reading gives the primary current of the transformer when the secondary is open circuited, which will be unchanged if the field coil under test is in good condition. A reading higher than normal indicates that the field coil has a short circuit, the reading varying with the number of turns that are short-circuited. If the test is continued for a sufficient length of time the location of the short circuit will be indicated by heating. Coils are tested for open circuits by grounding one terminal and applying a lamp circuit to the other.

All field coils are impregnated. The coils are dipped twice and baked. They are also subjected to a 2,000-volt test before being returned to service.

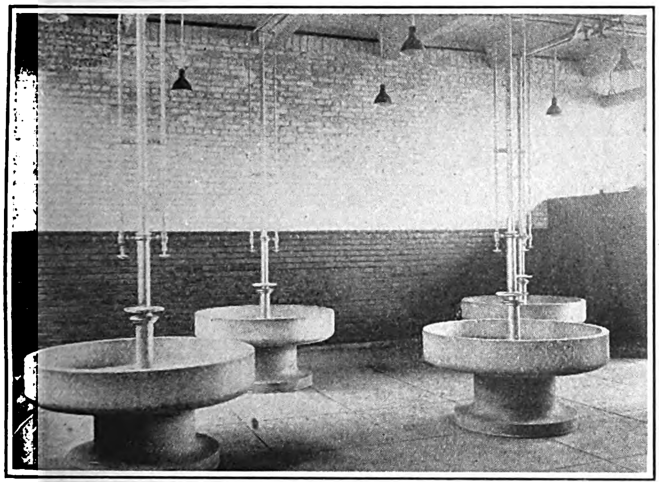
All coil winding and taping is done on the mezzanine, which contains the latest type equipment needed for this repair work. This department also contains a large number of hot coil presses. These are mounted on an angle framework, with the various valves and piping for steam heating carried underneath. Parts are transported to and from the mezzanine through a hatchway.

Most of the employees in the coil-winding and taping department are women. A restroom is conveniently located in the center section of the mezzanine which is fitted up with space for lockers, etc. The east end of the mezzanine is used for the repair of fare registers and passimeters used in subway service.

On the main floor of the shop, in addition to the departments already described, a space 32 ft. x 40 ft. in the southwest corner is partitioned off as a foreman's



At Left—All Field Coils Received for Repairs Have New Leads Installed. At Right—Winding New Armature Coils



Circular Wash Fountains Are Provided for Workmen

office. Near the east end under the balcony a large room has been reserved for equipment and later will be used as a testing laboratory. Provision will be made for tests on all kinds of materials used in electric railway construction and operation. The east end of the shop, supplied with an abundance of light, is used for the repair of controller equipment, contactors, switch groups, line switches, magnets, door-operating equipment, brush-holders and other small parts.

A feature of this shop is the provision of storerooms for supplies located conveniently to the point at which they are used. Section 2 is a small storeroom for controller parts, and at the other end of the room is a storeroom for other parts used in the department of electrical repairs. This has two floors and the material used in the coil winding and taping section is carried on the second floor.

A men's locker and wash room is provided in the center of the shop underneath the mezzanine. This is equipped with four Bradley wash fountains of latest design and two shower baths. The lockers are of all-steel construction, made to the company's specifications. Water for washing purposes is heated by a Ruud automatic multi-coil storage heater, regulated by thermostatic control. At convenient intervals throughout the shop are a number of Halsey Taylor drinking fountains. These have a large ice receptacle, 18 in. diameter x 18 in. high. The fountains are set on a pedestal with the top of the bowl about 40 in. above the floor. The drinking bowl is of porcelain. Water is turned on against a slight spring pressure, and is automatically shut off when the handle is released.

Kansas City Reconstruction Program Well Under Way

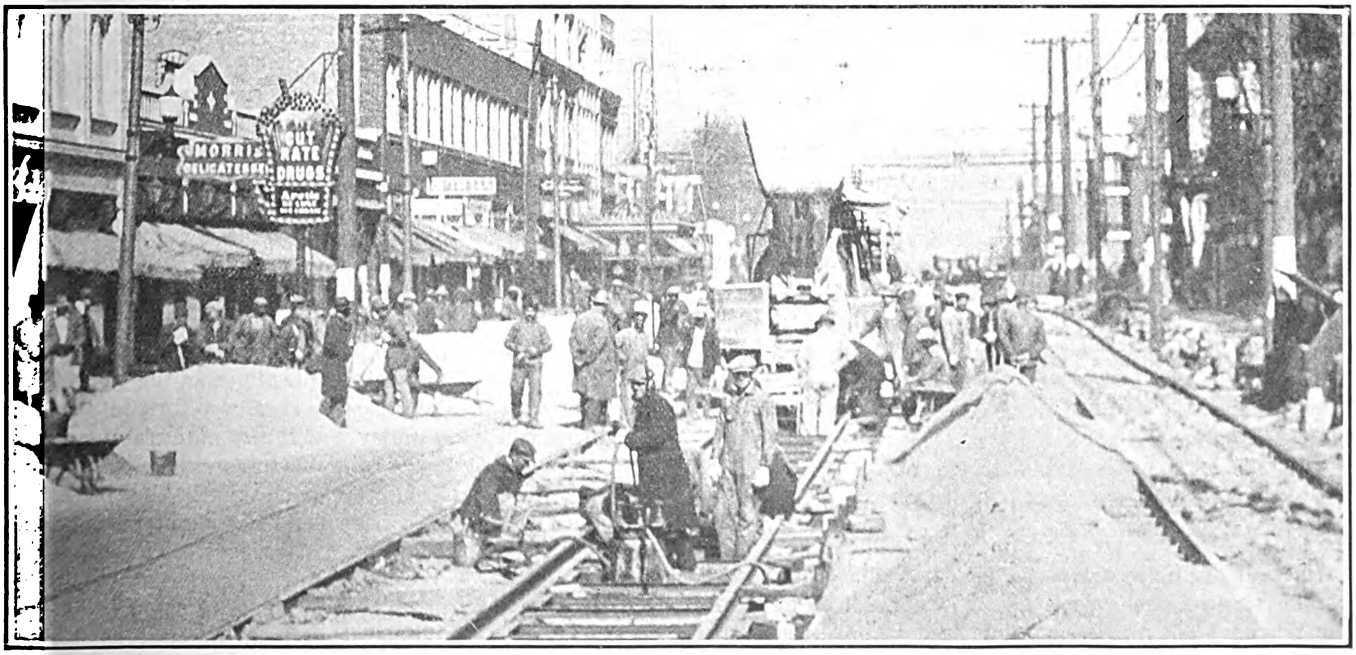
Eight Miles of Track Was Reconstructed or Built New Following the Lifting of the Receivership on Oct. 15 and Before Cold Weather Set In

REHABILITATION of the Kansas City Public Service property is one of the outstanding duties of the new management. An urgent program of some 8 miles of city track was started last October and completed in approximately two months, the total expenditure involved being $354,870. A part of this cost was for the dismantling of the superstructure of the elevated road.

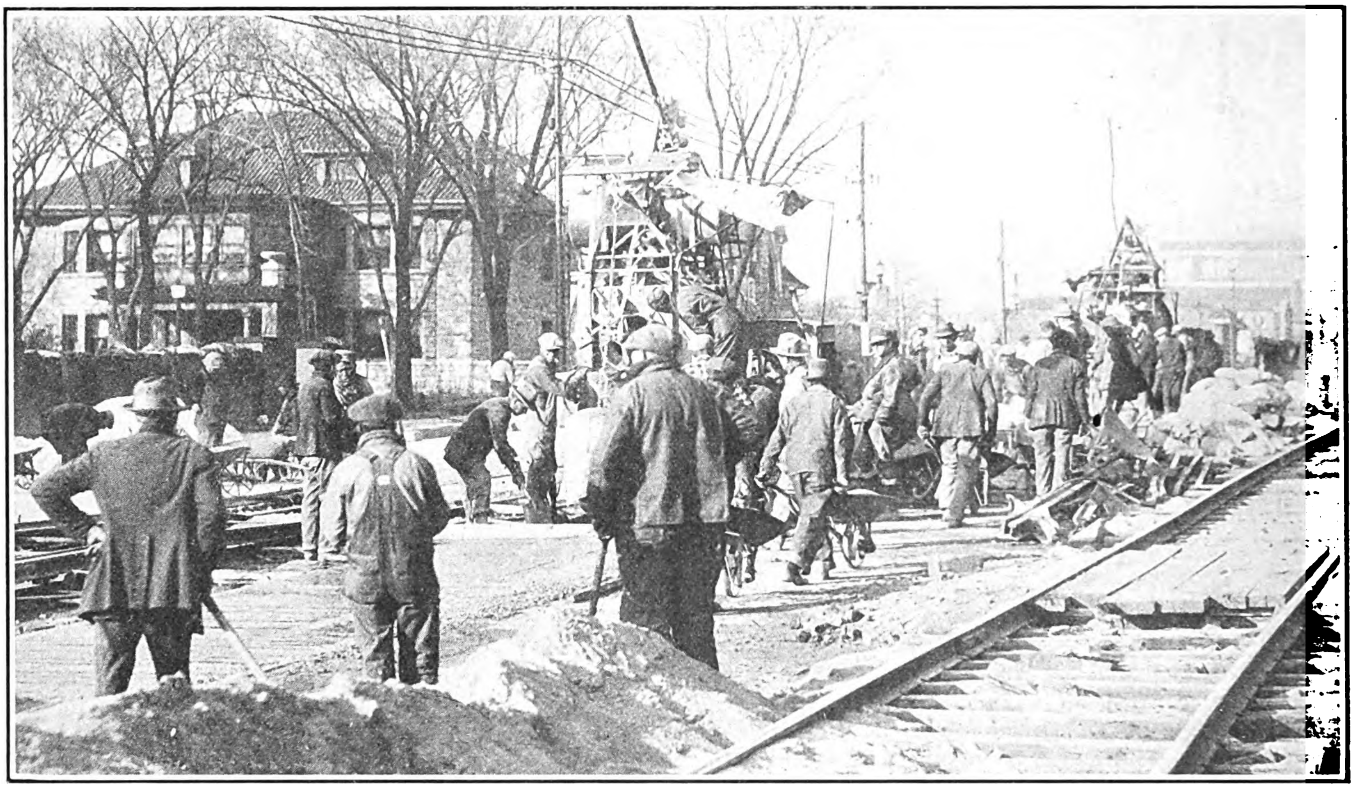
This is the first step of a $6,600,000 program of rehabilitation planned by the new owners under the leadership of President William G. Woolfolk of the William G. Woolfolk, Inc., engineers of Chicago, Ill.

The receivership was officially terminated on Oct. 15, but in order to get the most urgent work done before winter, permission was obtained to start the work on Oct. 11. Very little material was on hand, but rush orders were placed within a week, and no serious delays in the several jobs were encountered as material was received promptly. On Oct. 11 400 men were employed and on the following day this force was doubled and work was started at six locations.

During the receivership a standard type of track construction was adopted which will be continued. This consisted in the use of 7-in. tee-rail, Lorain section 93



Part of the Initial Track Reconstruction Program in Progress on Troost Avenue, Kansas City. The Standard Construction Is 7-In. Tee-Rail on International Steel Ties Imbedded in a 14-In. Concrete Slab



Putting on the Concrete Wearing Surface on Main Street, Kansas City. This Is Part of a Rush 8-Mile Reconstruction Program Completed Within Eight Weeks Following the Termination of Receivership Last October

No. 507, supported on International steel ties imbedded in a 14-in. concrete slab. The rails were canted 1 in 25. The base concrete consisted of a 1-3-6 mix. It was first poured up to the base of the rail and after the initial set concrete was tamped firmly under the tie plates and under the rail base. After this, concrete was poured to within 2 in. of the top of the rail and again thoroughly tamped against the web of the rail. Following this a 2-in. wearing layer of concrete using a rich mixture of 1-2-3 was placed and finished with an electric tamper and finishing machine. The work moved on smoothly, so that at the end of the construction period early in December approximately 1 mile of paved track had been constructed each week. This was considered a good record of progress in the face of the shortage of material when the work was undertaken in October.

KANSAS CITY TRACK RECONSTRUCTION IN THE TWO MONTHS FOLLOWING END OF THE RECEIVERSHIP

Location	Feet Single Track
Main Street, 40th to 43d	3,320
Grand Avenue, 20th to south end Viaduct	920
Main Street, Armour Boulevard to 39th	5,250
27th Street, Indiana to Cleveland	2,530
Troost Avenue, 31st Street to 37th	7,500
S. W. Boulevard, 19th and Main to Broadway	3,510
Main Street, Linwood Boulevard to Armour	3,140
Ninth Street, Mulberry Street to James	5,700
State Line, Olathe Boulevard to 45th	2,600
Country Club Line, 65th to 75th (new second track)	5,010
Total track reconstruction	39,480
Total cost for 7.5 miles	$338,800
Dismantling elevated road structures and double track	4,530

In most of the locations street car traffic was carried at one side of the street during the reconstruction of the tracks. The work was done under the direction of A. E. Harvey, engineer of construction. The 8 miles just completed is only a forerunner of many more planned for this year's program. The company has just announced its intention of reconstructing 23 miles, beginning as soon as weather permits.

Government Active in Standardization Movement

STEADY development has been shown in the fifth year of Mr. Hoover's division of simplified practice. About fifty simplifications have been carried through. These include a wide range of commodities. In a survey of nineteen of these commodities it is stated that from 51 per cent to 99 per cent of the sales are in accordance with the simplified practice recommendations, the average of the nineteen being 79 per cent.

The unification of government specifications under the federal specifications board has now reached a point where the main lines of government commodities are covered. More than 400 specifications have been approved, and a considerable number have reached the second edition. While contact with industrial groups has been maintained in the work, to a very considerable extent through the A.E.S.C., much yet remains to be done in thoroughly co-ordinating these government specifications with those in general use in the industries.

The bureau of standards has proposed an interesting plan of certification under which any manufacturer who is willing to supply goods made to comply with a given government specification may file with the bureau a statement to that effect. Consumers upon request will be given a list of such manufacturers. This plan has been widely discussed in a large number of organized industrial groups, since this proposal in some form may ultimately have far-reaching effects upon sales policies and upon our present method of distribution.

Better-Appearing Cars Needed

Electric Railway Industry Has Accepted the Challenge for More Attractive Rolling Stock—New Equipment Should Be Provided Where Possible and at the Same Time Increased Attention Must Be Given to Sprucing Up Existing Cars

MORE attractive cars were given consideration at a meeting of the rolling stock committee of the American Electric Railway Engineering Association held in New York Dec. 13 and 14. A resolution was adopted directing attention to the need of more attractive rolling stock. The opinion was voiced that concentrated effort in an attempt to acquire new rolling stock was not enough, and that there still existed a large field for improving existing rolling stock to provide more comfort, greater conveniences, increased safety and more attractive appearance. Many railways are rehabilitating existing cars which still can be operated economically and are providing these with improved devices and devoting particular attention to producing a trim, neat appearance by stream-lining in the car body construction and by attractive color schemes in painting.

The problem regarding rolling stock that is now presented to the electric railway industry is first to provide new equipment where possible and second to bring existing rolling stock which still possesses some useful life to a higher standard of attractiveness by incorporating in it as many of the splendid ideas as possible which are now used in new car designs.

We are living in an age of prosperity and the patrons of electric railways look for increased comforts and conveniences in cars over what was considered adequate a few years ago. The public has awakened to the idea that a higher fare is needed to pay for the added attractions and it is willing to pay it. The physical equipment of the railways must be made capable of giving the character of service demanded.

The rolling stock committee decided that the publication of articles discussing methods which have been used successfully by various railways in bringing existing rolling stock to greater usefulness was desirable. Various members of the committee volunteered to tell of results which have been accomplished on their properties, or of ways in which cars can be spruced up and be provided with added conveniences. In addition, any operator who believes that more attractive rolling stock will produce results was invited to express his views for publication. Two of the articles giving suggestions for the improvement of existing cars follow.—EDITOR.

Study Car Equipment with Reference to Appearance, Comfort and Convenience

BY W. R. MCRAE

Superintendent of Rolling Stock and Shops Toronto Transportation Commission, Toronto, Canada

FUNDAMENTAL ideas behind improved cars are to increase the passenger sales value of the rolling stock, to attract a greater volume of traffic than at present habitually patronizes a particular road, to increase the car riding habit and to induce people by every seductive method possible to abandon other competitive means of transportation.

If it were possible, the logical solution would be for a railway to replace the old and out-of-date rolling stock with new, incorporating the many splendid ideas now available, but there are few companies in this happy financial condition. With this done, it would be a comparatively easy matter to keep these cars in a condition with regard to appearance and comfort that would be a continual delight to the traveling public. The problem before the industry just now, however, is not only the design and evolution of new rolling stock but also the inclusion of as many as possible of the helpful ideas for additional comfort, convenience and attractive appearance to existing rolling stock.

The most difficult problem in connection with improvements in comfort, convenience, safety and appearance of cars does not occur so much on roads that operate in the large centers of population, and which are fairly strong financially, as to the owners of small railways which are waging a strenuous fight against all kinds of modern rubber-tired competition and with a comparatively low number of potential riders on whom they have to depend for revenue and their continued existence. There are many ways in which such roads can augment materially their revenue by careful attention to many of the suggestions and ideas that have been collected by the A.E.R.E.A. committee on this subject. Many of these roads are not in a position to go in for heavy capital expenditure and quite a number of the committee's ideas can be carried out at no very great expense.

The upholstered type of seat is the thing, undoubtedly, to adopt for the smaller railway with the attendant competition factors. A smooth and well-maintained track is a most important factor in easy riding quality of the car and systematic maintenance and inspection are necessary.

In dealing with the problem of comfort, one factor that is stressed in the committee's report is the discomfort and annoyance caused by improper handling of equipment in starting and stopping. In this matter, too little attention is sometimes given to the important factor in this operation—the human element, and the instruction of operators. Any additional comfort a passenger might derive from cushioned seats and more silent cars will be eliminated if the car is in the hands of an operator who, through lack of adequate instructions and training, or through carelessness, operates his car with jerky starts and stops. The training of a motorman is thus a large factor in the subsequent smooth and economical operation of the car. The establishing and equipping of a school of instruction for this purpose, with regard to the peculiar needs of the railway, would be an excellent investment for any electric railway. The expense involved is comparatively small and the results are felt ultimately in many ways.

The treadle-operated exit door, no doubt, has been instrumental largely in eliminating the inconvenience of the earlier one-man cars and made possible the development of the large one-man, double-truck car. A loud speaker for the announcement of approaching stops would add very materially to the convenience of passengers in this type of car and is worth attention.

Standardization of car entrances to eliminate confusion is well worth any expense. The resulting convenience to passengers and speeding up of the system has been amply demonstrated in Toronto, where the program of reorganizing to front entrance only has now been completed.

With front-entrance cars there is real need for the installation of some form of anti-slip aisle covering in the forward half of the car, and some improvement could be made in available commercial materials. At present we have installations of two types which take the place of the slats in parts of the car floor. Under diverse conditions these have given varying satisfaction.

A very great deal can be accomplished to add to the attractive and fresh appearance of cars by intensive attention to cleaning and washing and systematic painting. A clean and well-groomed car is a distinct selling asset and should be well within the economic capacity of the average railway. Without this feature it is impossible to attract the additional patronage so much desired. If every system was spurred to make supreme efforts in this direction the resultant gains soon would be apparent. An untidy appearance, eloquent of slovenly and haphazard care and attention, has the effect of alienating the public good will and support, without which no system can be successful.

With regard to painting, the psychological effect of the freshly painted car is undoubtedly that of a very persuasive and insistent salesman and, to the limit of its resources and income, there is no question that any railway will reap a very considerable patronage from the utmost effort that can be made in this direction. The spick and span, clean and newly painted car literally compels the patrons to sit up and take notice and is a constant perambulating advertisement of the fact that the management is doing its best to live up to the motto "It pays to please." There can be no excuse for cars being dirty, even though they may need paint and varnish. Soap and water are both cheap.

Rolling Stock Should Give the Best Impression Possible

By A. T. Clark

Superintendent of Rolling Stock and Shops United Railways & Electric Company, Baltimore, Md.

FIRST impressions are lasting impressions, according to an old adage. No wonder, then, that when a prospective street railway patron sees a dirty, poorly painted car approaching he concludes immediately that the railway company and all its endeavors are slipshod and in keeping with the appearance of this part of the equipment. No matter what later impressions of a better kind this patron may obtain, he still is of the opinion that the company, like the car, needs an overhauling. Not only has he acquired a poor idea of the system as a whole but he is ready to kick and complain of all the small incidents that may occur during his ride.

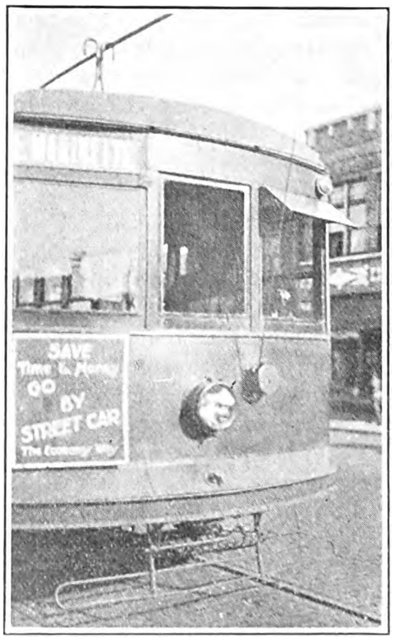
Now let us suppose that instead of a dirty, poorly painted car that came along while he was waiting the car had been well painted and was still in good condition, and in addition generally clean and attractive. In this case the patron would feel that the management behind the system was taking the best of care of what it had and was keeping its cars inviting in appearance. In most cases this car patron would not be so apt to be critical of any shortcoming; i.e., if the car was a minute behind he would be less likely to berate the conductor about this condition or to start an argument with some other complainer about how poorly this particular system may be operated. All because the first impression has put him in a pleasant frame of mind rather than the reverse.

Many companies believe that the cost of keeping cars in good paint condition and generally clean in appearance is very high. While it may require an unusual expenditure to work out a system of frequent and regular car painting and car cleaning, eventually this cost soon drops to a low amount well within the ability of any well-organized company to maintain indefinitely.

In addition to the better reaction of the riding public from well painted and thoroughly cleaned cars the management will obtain a direct benefit from the motormen and conductors, who naturally and unconsciously react on a higher and better plane of endeavor because of the higher morale resulting from the better appearance of the cars.

Sun Visor Protects Motorman from Glare

A SUN visor, similar to those used on automobiles, is the latest safety device which is being used on the Ogden-Main line of the Menominee & Marinette Light & Traction Company, in Marinette, Wis. This line runs principally east and west and the glare of the sun was found to be uncomfortable and irritating to the car operator. A local operator consequently suggested a shade which was designed and installed on the cars in the shops. The shade is made of sheet metal, is neat appearing and serviceable, and is proving very effective.

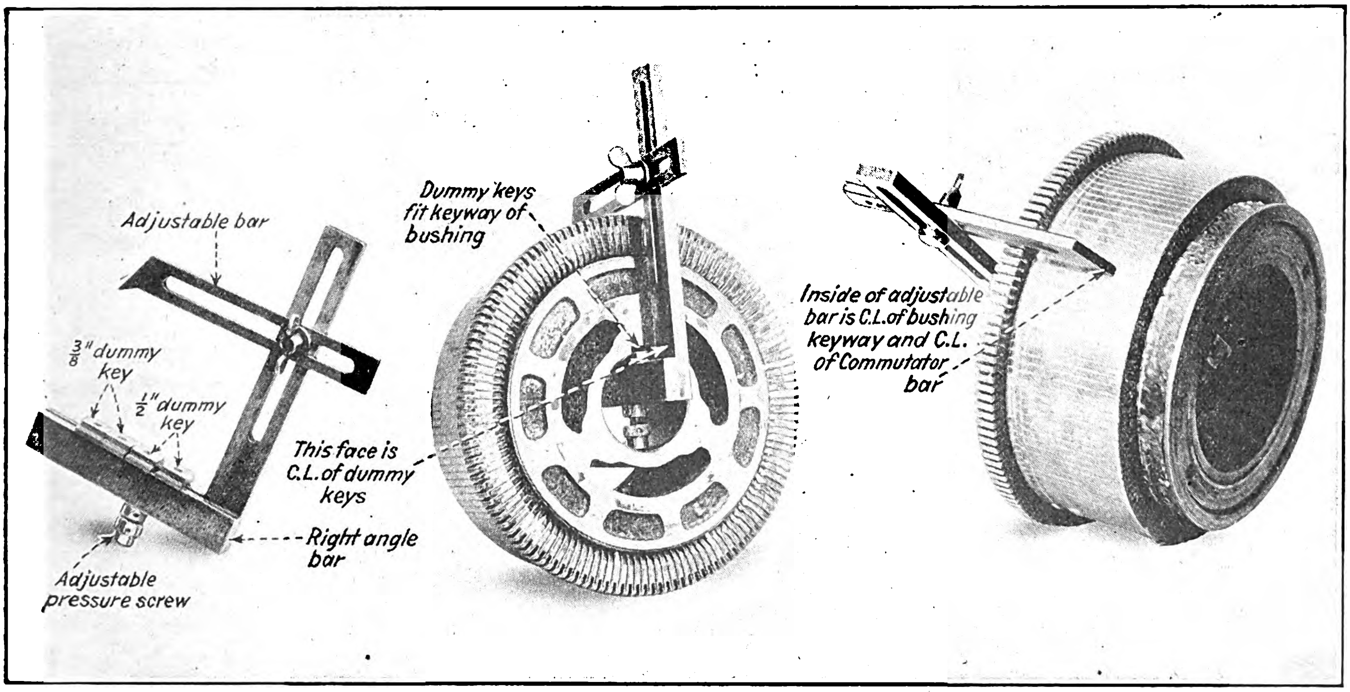


Car Equipped with Sun Visor Over Front Window Shields Operator from Glare

Methods and Equipment for Efficient Assembling of Commutators*

By Jesse M. Zimmerman
Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company

Many Important Considerations Must Be Taken Into Account in Assembling the Individual Parts of V-Bound Commutators and in Pressing the Complete Commutators on the Spider—Methods of Tightening and Aligning Commutators Are Described, Together with Some Handy Tools that Will Facilitate the Shop Operations


Adjustable bar
3/8" dummy key
1/2" dummy key
Adjustable pressure screw
Right angle bar
This face is C.L. of dummy keys
Dummy keys fit keyway of bushing
Inside of adjustable bar is C.L. of bushing keyway and C.L. of Commutator bar

Methods of Aligning the Commutator Bars with Respect to the Commutator Spider Keyway

COMMUTATORS can be made tight fitting only if the parts are accurately machined and particular care is given to assembling. The order of the assembling operations is, first, to fit the steel V-ring over the spider. This may require some filing to remove paint and rust. Next, the commutator nut should be tried on the bushing. It may be necessary to clean out the threads of the bushing to allow the nut to screw up by hand. Then, when the detachable V-ring is under pressure, the commutator nut can readily be run up against the detachable V-ring, thus retaining the steel V-ring under the pressure given it.

The parts should then be dismantled and all dirt and paint must be scraped off, especially from the metal V's. The V's in the assembled segments can be cleaned with fine sandpaper, but should not be scraped with a knife, as it may deposit copper over the mica. After blowing out the dirt the commutator should be checked for short circuits with 600 volts between bars and after the V's have been cleaned and tested they should be brushed with a thin coat of shellac. The mica V-ring should be cleaned carefully with sandpaper, especially at the fit of the V's. After the surface which touches the copper has been thoroughly cleaned it should not be touched by the hand or any object whatsoever. This eliminates the possibility of dirt or moisture getting on the ring and causing a short circuit between bars after the commutator has been assembled.

The armature should be stood upright with the commutator spider uppermost while the rear mica V-ring is assembled. Then the assembled segments can be placed on the spider and the detachable front steel and mica V-rings assembled. The 3-deg. angles of the mica V-rings will bind against the 3-deg. angle of the copper V's before the banding wire is removed. The front mica V-ring must not be forced down, as to do so would injure the mica.

The commutator nut or bolts, if the commutator is a bolted type, should be located carefully as it is probable that the threads of the nut or bolts will not catch the threads on the bushing. Two pieces of cotton tape should be tied around the segments, one above the top banding wire and the other below the lower banding wire. Then a U-shaped clamping bar can be placed over the shaft so that it will bear on the detachable V-rings, as shown in an accompanying illustration. With the pressure clamp in position rectangular washers can be placed over the two bolts having long threads. The slack can then be taken up by tightening the clamping nut.

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*This is the fifth of a series of articles on commutators for railway motors. The others were: Choosing Materials for Railway Motor Commutators, published Aug. 21, 1926; Important Considerations in Replacing Commutator Bars, published Oct. 23, 1926; Accurate Machining of the V's of Assembled Commutators Is Essential, published Nov. 20, 1926, and Mica V-Rings and Bushings Have Important Functions in Commutators, published Dec. 18, 1926.

The lower banding wire can now be cut and the slack should be taken up again by tightening the clamping nut. Next the upper banding wire can be cut and the slack again taken up. "Opened-up" places will appear between bars when the banding wire is cut. These "opened-up" places will disappear when the commutator is heated and subjected to pressure.

Proper alignment should be checked with a square. The bars should not be out of alignment more than the width of a mica strip.

The center line of the mica strip, or copper bar, as the case may be, should be lined up with the center line of the armature or slot tooth. Information for proper location will be furnished by the manufacturer of the motor. The metal V-ring should be tapped lightly with a rawhide hammer and the slack again taken up by tightening the clamping bolts. The commutator nut or bolts can now be tightened so that the assembly will be held firm when the clamping bar is removed. No attempt should be made to try to tighten the commutator assembly with the commutator nut while the assembly is cold. To do so will injure the mica V-rings. Also, the commutator assembly should not be tightened with the commutator nut without applying pressure to the steel detachable V-ring, as it may turn with the commutator nut during the tightening process, thus skewing the bars.

The armature should next be heated in a baking oven with maximum temperature not exceeding 150 deg. C. However, a baking oven with a temperature of 110 deg. C. will be satisfactory. A presure of 20 to 30 tons should be applied to the detachable steel V-ring to draw the commutator nut home while hot and under pressure.

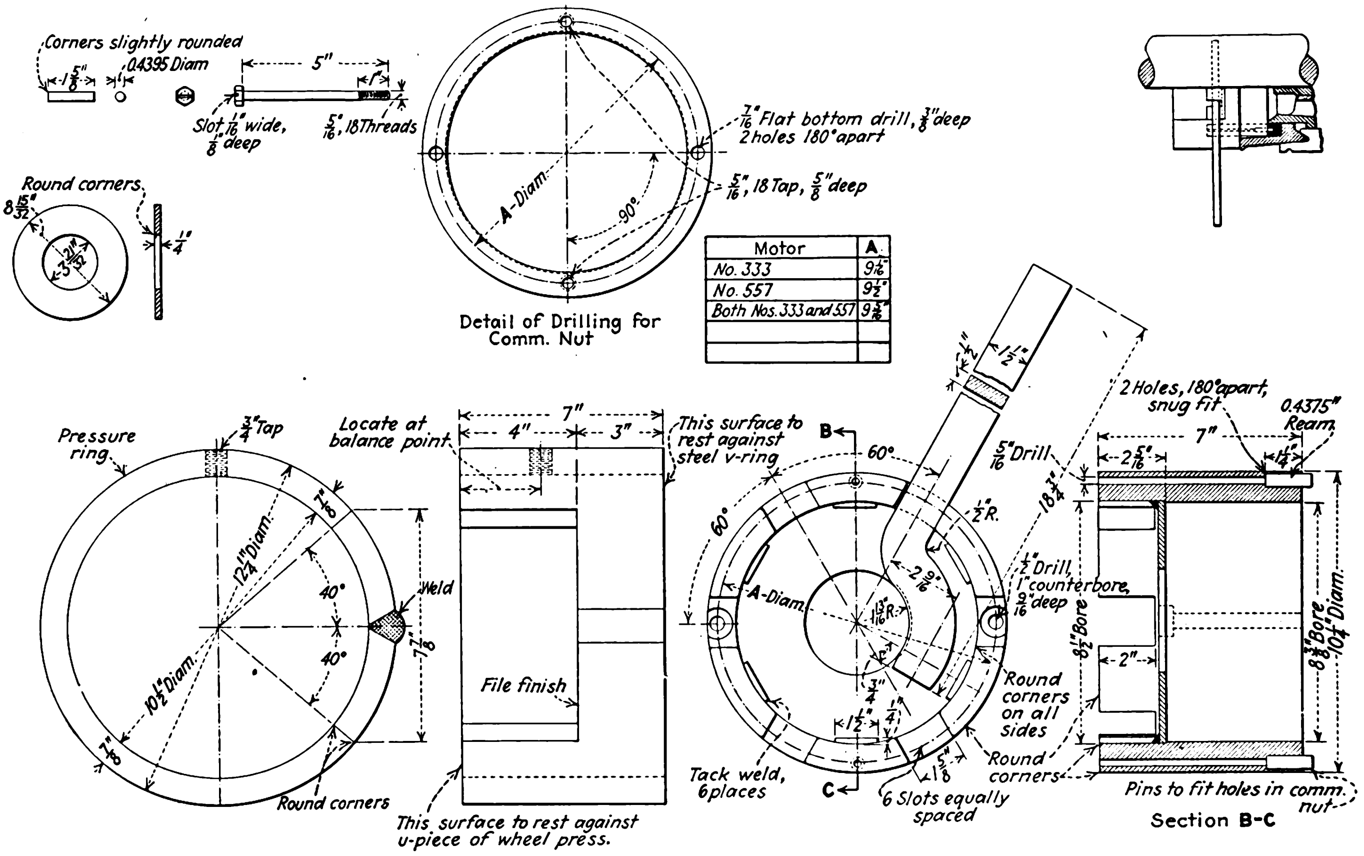
After the assembly is cold, tests should be made for loose bars by tapping on the end of the bars with a hammer while holding the finger against the end of the bars. If any of the bars are loose they will vibrate. Finally, the commutator should be given a 600-volt bar to bar test and a 4,000-volt ground test.

Before describing the method of applying the necessary pressure to the detachable steel V-ring a commutator wrench will be explained which can be used with any of the methods for applying the necessary pressure.

A convenient type of commutator wrench is shown in an accompanying drawing. It consists of three major parts, the ratchet ring, the pressure ring and the wrench handle.

The outside diameter of the ratchet ring should be the same as the outside diameter of the commutator nut. Since the ratchet ring is to be bolted to the commutator nut, the inside diameter should be machined ¼ in. larger than the inside diameter of the commutator nut. This will eliminate any interference of the ratchet ring and the spider threads when the commutator nut has been drawn home. The length should be the distance from the commutator nut to the end of the detachable steel V-ring plus 5 in. This will leave sufficient room to operate the wrench handle when the commutator nut is tight.

Six equally spaced slots should be cut approximately 2 in. deep and 1¾ in. wide. The slots can be milled or cut by first drilling a 1¾-in. hole and removing the remaining metal with a hack saw, milling saw or with an


Corners slightly rounded
0.4395 Diam
5"
Slot 1/16" wide, 1/8" deep
5/16", 18 Threads
Round corners
Detail of Drilling for Comm. Nut
7/16" Flat bottom drill, 1/8" deep 2 holes 180° apart
5/16", 18 Tap, 5/8" deep
A-Diam
90°
Motor | A
No. 333 | 9 1/16"
No. 557 | 9 1/2"
Both Nos. 333 and 557 | 9 1/2"
Pressure ring
3/4" Tap
Locate at balance point
7"
4"
3"
This surface to rest against steel v-ring
12 1/4" Diam
10 1/2" Diam
40°
40°
Weld
File finish
Round corners
This surface to rest against u-piece of wheel press.
B
C
60°
60°
5/16" Drill
1/2" R.
1/2" Drill, 1" counterbore, 9/16" deep
2 9/16"
Round corners on all sides
Round corners
Tack weld, 6 places
6 Slots equally spaced
1 1/2"
18 3/4"
2 Holes, 180° apart, snug fit
0.4375" Ream
7"
2 5/8"
2"
8 1/4" Bore
8 3/4" Bore
10 1/4" Diam.
Pins to fit holes in comm. nut
Section B-C

Commutator Wrench Which Can Be Used in Conjunction with a Ring Press for Assembling Commutators Either While They Are on the Armature Assembly or in a Vertical Press

At top, Pressure ring. At bottom left, Body. At right, Handle.

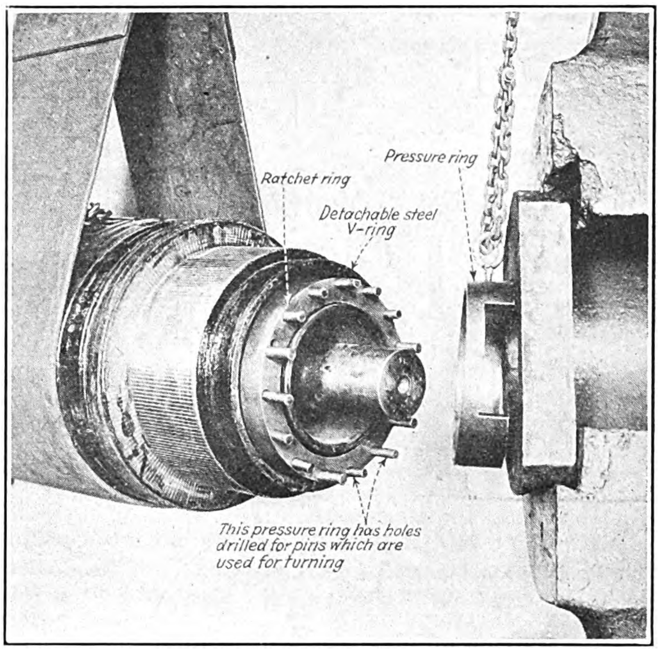
acetylene torch. The ratchet ring shown in the illustration for tightening a commutator in a hydraulic wheel press has fifteen pressure pins instead of the six slots. Either slots or pins will be satisfactory.

On the other end of the ring two holes for spanner pins are drilled 180 deg. apart and on the same bolt circle as the spanner holes in the commutator nut. A smaller hole should be drilled through the ring. This hole should be redrilled approximately 1¾ in. deep for the spanner pin. This will provide a stop for the spanner pins, thus keeping them from driving too far into the ring. By having the hole drilled through the ring the pins can be driven out should they break off.

Diametrically opposite from the spanner pin hole and on the same bolt circle two additional ½-in. holes should be drilled through the ring. The holes are for two bolts, which will be used to hold the ratchet ring to the commutator nut. It will be necessary to drill and tap two $\frac{5}{16}$-in. holes in the commutator nut besides the two spanner pin holes which are already drilled. This will eliminate the difficulty of holding the ratchet ring in place during the tightening operation.

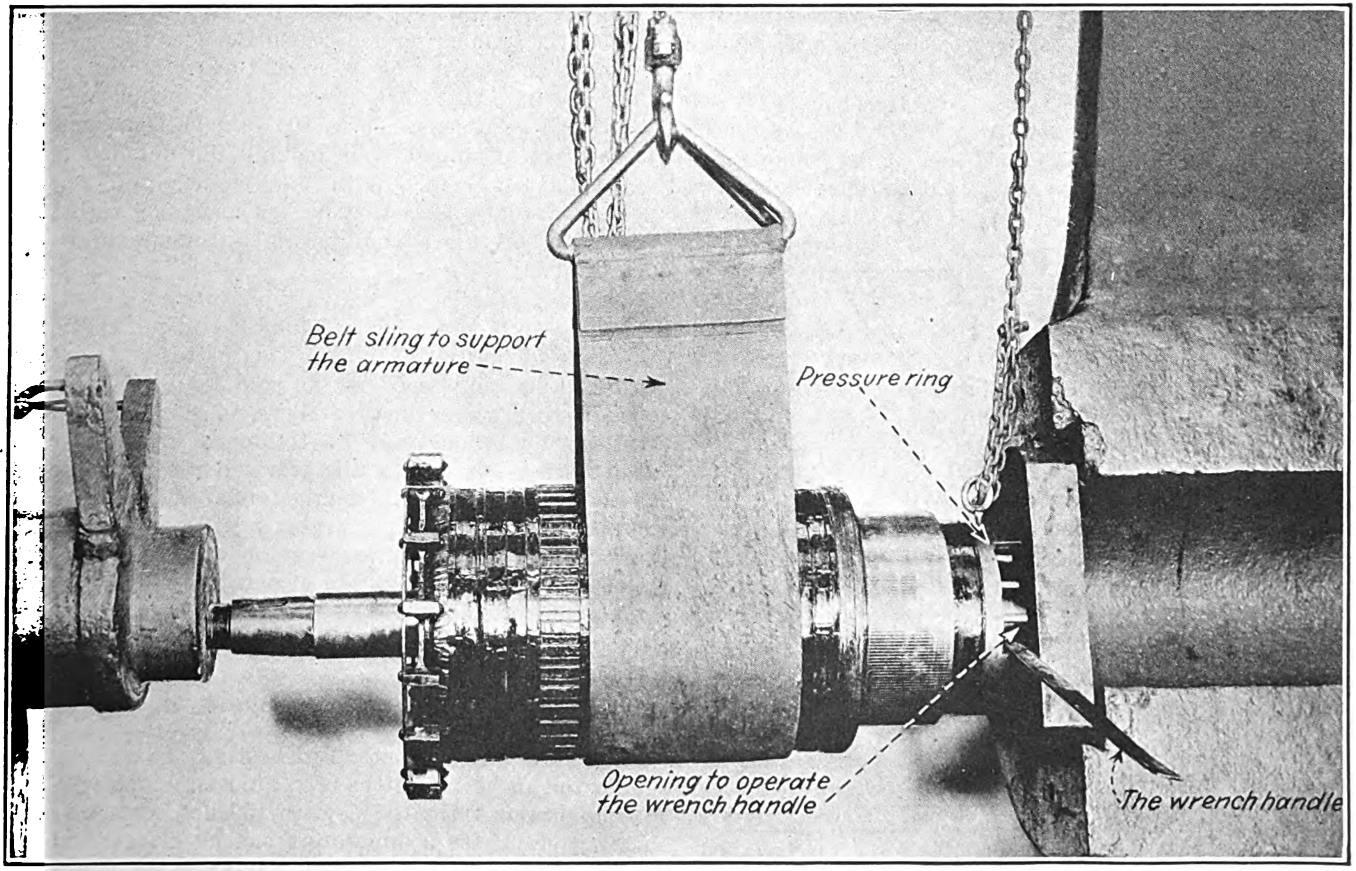
In order to relieve the strain on the two holding bolts described in the preceding paragraph it is well to bore the inside diameter of the ring in the front ¼ in. larger than the diameter at the rear. A circular guide plate should be placed in this offset and spot welded in place. The guide plate must have a hole bored in it large enough to fit over the shaft. It is best to wrap the shaft with a strip of thin sheet copper to keep the guide plate and the wrench handle from marring the polish on the journal.

The features outlined in the two preceding paragraphs are not necessary where a vertical press is used, because the weight of the ring will keep the spanner pins in the hole in the commutator nut. However, where the wrench is to be used in a horizontal press one will appreciate the necessity of bolting the ratchet ring to the commutator nut after trying to hold it in place during the tightening operation.

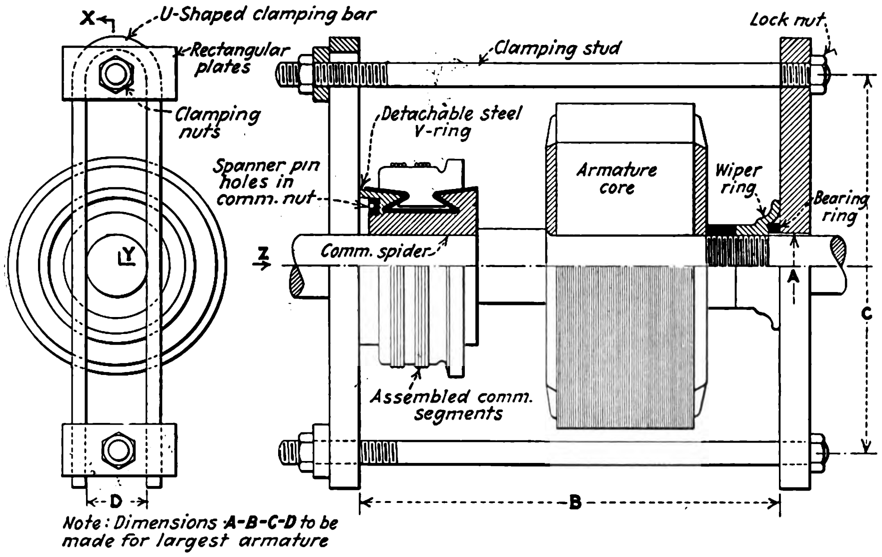

Pressure ring
Ratchet ring
Detachable steel V-ring
This pressure ring has holes drilled for pins which are used for turning

Parts Used in Tightening Operation in Wheel Press

Since the duty of the pressure ring consists in transmitting the pressure from the press to the detachable steel V-ring during the tightening operation it is essential that the face which comes in contact with the detachable V-ring should be solid in order to transmit


Belt sling to support the armature
Pressure ring
Opening to operate the wrench handle
The wrench handle

Tightening a Commutator in a Hydraulic Wheel Press with the Use of the Commutator Wrench



Note: Dimensions A-B-C-D to be made for largest armature

Press Which Can Be Used for Assembling Commutator When the Commutator Assembly Is on the Armature Shaft or Spider

the pressure evenly. It will be necessary to cut an opening in the other end for the operation of the wrench handle. If the slots in the ratchet ring span 60 deg., then the opening in the pressure ring should be at least 80 deg.

The outside diameter of the ring should not be smaller than the outside diameter of the steel V-ring. The inside diameter of the ring should be small enough so that the pressure face of the steel V-ring is covered. However, it should be at least $\frac{1}{4}$ in. larger than the ratchet ring. The thickness of the ring should be approximately $\frac{3}{4}$ in. or more.

The wrench handle should be curved at one end to fit over the shaft. The straight end of the handle can be used when the commutator is assembled before the commutator spider is pressed on the armature spider. A wrench similar to the one described above was made by Roy Clark, master mechanic, and Sam Augel, assistant master mechanic of the Saginaw, Mich., shop of the Michigan Railroad to be used in the assembly of Westinghouse 557 and 333-V commutators. These commutators being similar, it was possible to adjust the dimensions so that one wrench could be used on both commutators. This wrench was made as follows:

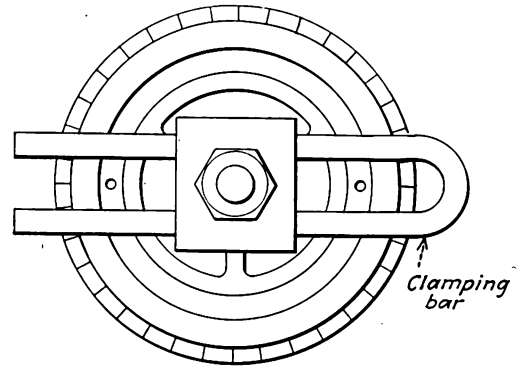
The ratchet ring was made from the hub of an old gear, the spokes being cut off with an acetylene torch. The hub was then placed in a lathe where the outside diameter was turned to $10\frac{1}{4}$ in., and the inside diameter bored $8\frac{3}{8}$ in. The ends of the ring were faced so that the finished ring was 7 in. long. The slots were made by first drilling $1\frac{3}{4}$ in. holes and then cutting the rest of the metal out with the acetylene torch. The bolt circle, *A* for the spanner pins and the holding bolts was made $9\frac{5}{16}$ in. The drilled holes for the spanner pins and the tapped holes for the holding bolts in the commutator nut were drilled and tapped on a $9\frac{5}{16}$-in. bolt circle. The guide plate was located by boring the front inside diameter $8\frac{1}{2}$ in. and $2\frac{5}{16}$ in. back. The diameter of the guide plate was machined $8\frac{15}{32}$ in. in diameter. It was held in place by six spot welds.

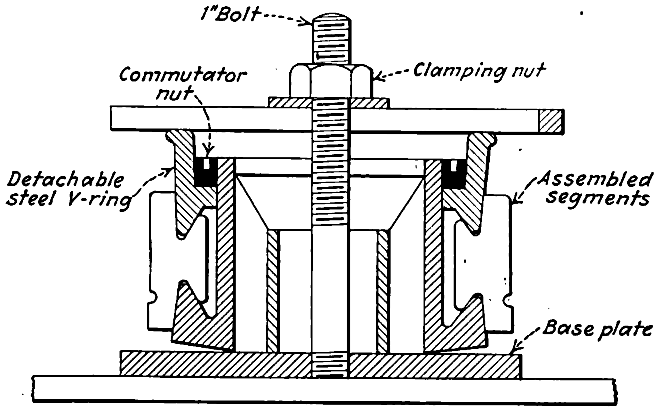
The pressure ring was forged out of a hot rolled steel plate $\frac{7}{8}$ in. x 8 in. x 36 in. It was forged around an old pinion whose outside diameter was $10\frac{1}{2}$ in. The ring being large, it was not necessary to weld it. The opening for the spanner wrench was made with the acetylene torch. The forged ring when cold was slightly smaller than $10\frac{1}{2}$ in. Therefore, it was placed in the lathe and the inside bore machined to $10\frac{1}{2}$ in. The two pressure faces were machined, thus making the finished length approximately 7 in. With this wrench and a wheel press Mr. Clark feels that he has made the tightening operation of his commutators a simple and sure operation.

It is bad practice to tighten the commutator nut with a special drift and a heavy hammer without applying a pressure to the steel V-ring. This batters up the commutator nut and steel V-ring and tends to turn the steel V-ring, which in turn skews the bars. The commutator nut should not be tightened until after the steel V-ring has been subjected to a pressure and the assembly heated. This method of heating the commutator and applying the pressure will be discribed for two conditions: First, where the commutator spider has not been pressed on the armature spider, and, second, where the commutator spider has been pressed on the armature spider.

Tightening a Commutator Where Its Spider Has Not Been Pressed on Armature Spider

The most efficient method of heating the commutator under the above conditions is in an oven which will heat a commutator from 125 deg. to 150 deg. C. A simple heating stand for commutators can be made as shown in an accompanying sketch. The hole in the stand





A Simple Assembling Plate Which Will Facilitate the Assembling of Commutators When They Are Not Part of the Assembly should not be larger than the opening in the commutator spider. This opening allows the flame of a gas torch to pass through the commutator spider. An asbestos board, with a hole for the gas to escape, should be placed over the top of the detachable steel V-ring. It is not advisable to use a sheet steel plate, as the heat will cause it to warp and allow the flames to pass between the plate and the detachable V-ring, thus consuming the bond in the mica V-rings.

The temperature should be measured with a thermometer, it being placed on the copper bars next to the V-ring, with the bulb covered with putty. This will give a true indication of the temperature of the copper. The thermometer should register from 125 deg. to 150 deg. C.

Skewing of commutator bars can be prevented by placing the commutator on a clamping plate, as shown. It consists of a steel base plate, a bolt and a clamping bar. After the bars have been properly aligned the commutator is placed on this plate and the clamping bar is drawn down. The clamping bar serves as a press and prevents the detachable steel V-ring from turning. Several blows on the steel V-ring with a rawhide mallet will cause the V-ring to take its place. After the clamping bar has been drawn tight the commutator nut can be tightened.

For small commutators the clamping bar as just described will furnish sufficient pressure to obtain a tight commutator. However, on large commutators it will be necessary to use a press and a special wrench as described in the first part of this article.

VERTICAL PRESS METHOD OF TIGHTENING COMMUTATORS

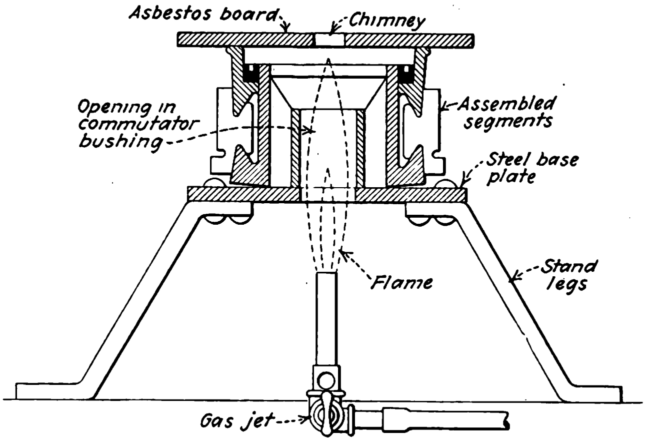
After the commutator has been heated and the bars aligned properly the commutator is ready to be placed on the vertical press with the front of the commutator up. The ratchet ring should be placed so it will engage the two spanner pins in the holes in the nut and the ring should be bolted to the nut with two bolts. The pressure ring can then be slid over the ratchet ring so that the solid side of the ring will be against the steel V-ring. The pressure ring should be subjected to a pressure of 20 to 30 tons, depending upon the size of the commutators. The wrench handle placed through the opening in the pressure ring into the slots in the ratchet ring will draw the commutator nut home.

It is possible to use the press without this commutator wrench by applying the pressure to the steel V-ring and by tightening the nut with a drift. However, this is more difficult and the results will not be as good.

TIGHTENING A COMMUTATOR AFTER ITS SPIDER HAS BEEN PRESSED ON THE ARMATURE SPIDER

Before undertaking to assemble a commutator it should be heated to 125 deg. to 150 deg. C., regardless of the method used. The heating operation is necessary to soften the bond in the mica V-ring and the commutator strip. Subjecting mica to a pressure while it is cold pulverizes the bond. On the other hand, if the mica is heated the bond will soften and allow the mica to conform itself to the metal parts when a pressure is applied. For this reason only is it necessary to heat the commutator.

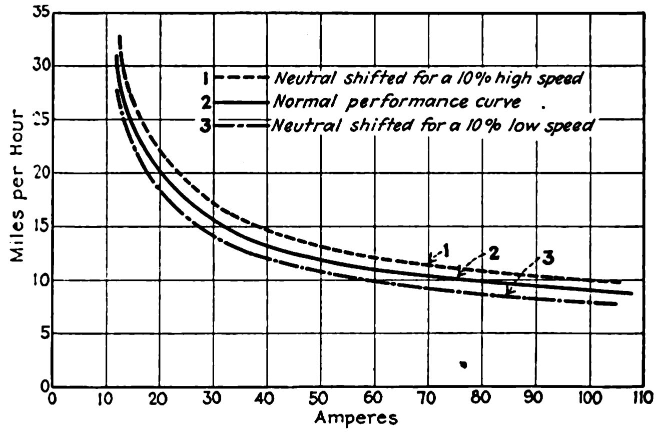
In heating a commutator it is best not to allow the flame to touch the copper. However, where no oven is available, to a certain extent the flame will have to be played on the copper. Before starting to heat the commutator, the mica V-ring should be covered with asbestos cloth so that the flame will not burn the bond in the mica V-ring. It is well to do most of the heating on the commutator spider and steel parts of the armature core as they will retain the heat longer, thus keeping the mica V-ring hot during the tightening operation.



Method of Heating a Commutator When the Commutator Is Not Assembled on the Commutator Spider

The ideal method of tightening a commutator under this condition is with the wheel press after the commutator has been heated. In this operation the armature should be supported in a sling and the ratchet ring should be bolted to the commutator nut. The pressure ring can then be slid over the ratchet ring, after which the slack on the press should be taken up and the pressure ring adjusted. By applying the necessary pressure the commutator nut can be drawn home with the curved end of the handle against the shaft.

For various reasons some companies will not feel like spending the money for a commutator wrench or a press for tightening their commutators. For commutators used on 30-hp. motors or less than 30 hp. a very efficient press can be made to do the work at a very low cost. Such a press is shown in an accompanying line drawing and was made by placing an old car wheel or some sort of a base plate on a level foundation. Two 2-in. holes were drilled in the web of the wheel near the flange and two upright posts were fastened with two nuts, one on each side of the wheel. These posts were made of 2-in. bolts about 30 in. long and were threaded at both ends, the thread at the top being 12 in. long. The armature shaft is placed in the hole in the hub and the necessary collars are inserted so that the



Performance Graphs of a Westinghouse No. 508-A Railway Motor Showing Effect of Shifting Commutator

armature will be supported from the wiper ring face and not by the extreme end of the flange of the wiper. A U-shaped bar is placed over the shaft so that it will rest on the interchangeable steel V-ring and the necessary pressure is applied by screwing the bolts down so as to turn the commutator nut home.

This press can be modified to suit existing conditions. However, its use should be limited to small commutators.

ALIGNMENT OF COMMUTATOR BARS IS IMPORTANT

Correct alignment of commutator bars with respect to the center line of the starting coil, when rewinding the armature, will insure correct location of the neutral commutating zone. If the commutator bars are not correctly aligned with the center line of the armature coil the neutral commutating zone will be shifted. This will produce the same results as shifting the brushes the same distance in the opposite direction.

Shifting the commutating zone will cause the motor to have a higher or lower speed, depending upon the direction of rotation. Let us assume a possible case. A car is equipped with two motors, both having the commutator bars shifted the same distance but in the opposite direction from the neutral zone, the one motor having a 10 per cent high speed and the other a 10 per cent low speed. If the car runs continuously in one direction, below 10 m.p.h., the motor with the high speed will carry approximately 50 per cent more of the total load. When the car is operating at a higher speed this difference in load will decrease as the speed increases. This is illustrated in the motor curve, reproduced. There is a 50-50 chance that the motor having the higher speed may also have the larger wheel diameter, assuming that one set of wheels may be worn more than the other. The above illustration shows the importance of having the motors run at as near the same speed as possible, thus eliminating undue overheating.

The conditions may not be as bad as pictured above, but they will vary in proportion to the distance that the commutator bars are out of alignment. Motors having wider bars will produce a greater variation in speeds and commutating difficulties. The commutating pole motor is more sensitive. Therefore, the alignment must be more accurate.

Shifting of the commutating zone will agitate sparking. Sparking will cause flashing, when the motor is operating at a high speed, as well as numerous other commutation troubles.

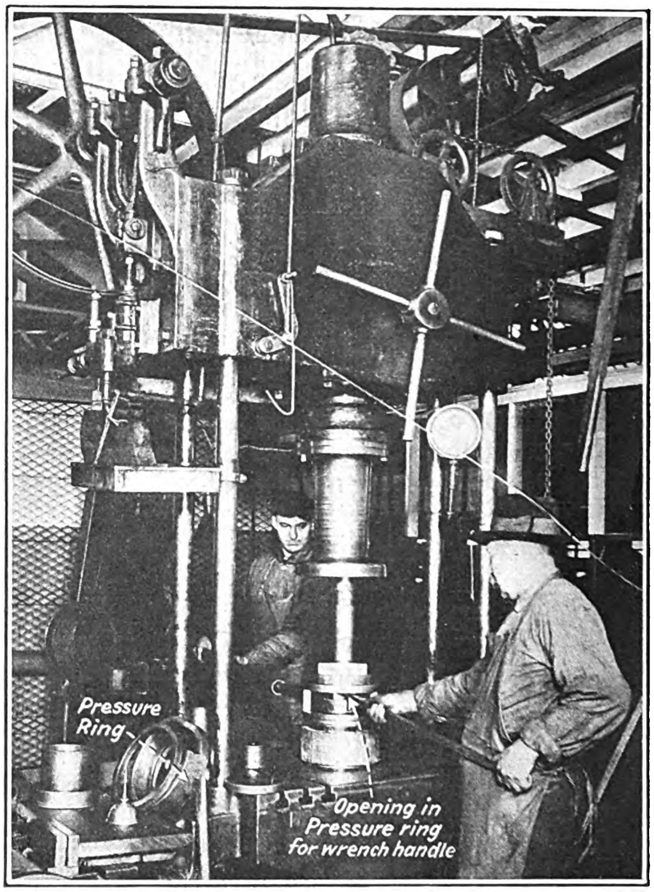
TOOL FOR ALIGNING COMMUTATOR BAR WITH ARMATURE SLOT

A simple aligning tool can be made from a straight edge bar about 1 in. wide with two stationary pins and one movable, so spaced along the center line of the bar that the two stationary pins will rest on the center line of the armature tooth while the movable pin will be above the commutator. This tool is inexpensive and easy to make. It can be used on all types of armatures.

The center line of the keyway in the commutator bushing is usually the center line of a slot in the armature core. This definite relation is maintained by the relation between the common center line of the keyways in the armature spider, the commutator bushing and the armature punchings.

One aligning tool can be made to fit all the commutator spider keyways by using different sizes of dummy keys, as shown in accompanying illustrations. The right angle bar is made so that the inside of its vertical bar is the center line of the dummy key, which would make it the center line of the keyway in the commutator bush. This makes the inside of the adjustable bar the center line of the dummy key.

The dummy key fits the keyway in the bushing. The gage is held in place by the adjustable pressure screw. This particular commutator calls for the center line of the keyway to line up with the center line of a commutator bar. If the center line of the bar coincides with the inside of the adjustable bar, then the center line of the commutator bar will be in alignment with the center line of the armature slot when the bushing is pressed on the armature spider. If a commutator calls for the center line of the mica to align with the center line of the keyway, the inside of the adjustable gage must coincide with the center line of the mica.



Assembling a Commutator in a Vertical Hydraulic Press

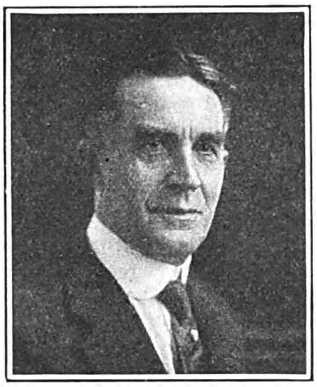
In the final test the following important dimensions should be checked. These dimensions should be recorded before the old commutator segments are moved:

1. The distance from the rear of the bar to the rear end of the bushing. This determines the correct location of the commutator.
2. The width of the neck. This will determine whether the clearance between the brush-holder and the neck will be correct.
3. The length of face to make sure the brush surface is the proper width.
4. The outside diameter of the face to give the correct clearance between the brush-holder and the commutator.

We Are Acquiring a New Viewpoint*

Manufacturer and Operator Have a Common Interest in the Future of the Transportation Business —Former Methods and Precedents Are Subject to Question—There Is Growing Evidence that Improvement of Facilities Is a Paying Process

By Willits H. Sawyer
President American Electric Railway Association
and President East St. Louis & Suburban Railway


Willits H. Sawyer

WE ARE beginning to get proof of the soundness of the policies adopted by those electric railway properties which have had sufficient confidence in the local transportation business to go ahead in the expenditure of money and effort for the improvement of their facilities and the development of an aggressive merchandising program. Today we are not going to conventions for the purpose of commiserating with each other and talking about our troubles. We are beginning to look forward with courage and enthusiasm, instead of backward with self-pity and doubt. We are now asking ourselves what we should be doing instead of reciting our troubles and begging some one else to do something. We are looking to the future. And as we look, we see more clearly every day the incontrovertible fact that the public must have public transportation service, and that even the coming of the private automobile has not changed that fundamental requirement.

TRANSPORTATION IS A NECESSITY

We can nail down hard this one basic fact, "The public must have transportation." We, as transportation men, are the logical people to furnish it. Our job is to supply a character of service which will adequately meet present-day conditions. Once we do that our difficulties will diminish rapidly. It is to the growing appreciation of these facts that the present-day difference in the character of conventions such as this is attributable. We are now going to conventions to get new ideas for self-improvement. We are trying to learn how to do a better job than we have been doing. And the man who misses that point in a convention is missing the very reason for his attendance.

During this meeting of the Midwest Association we have been talking about the advantages of new cars. We have been considering the reasons for new cars. There has been presented here the experiences of some of the properties that have tried them and figures showing the price the industry is paying as the result of the operation of obsolete equipment. It has been a most convincing story. The effect of modern cars on operating costs and revenues has been demonstrated. But that is only part of the story which has been told. In the past cars have been considered as an engineering matter. Today they are being considered from the sales viewpoint. We have given much consideration to their design, from the standpoint of engineering and economics, but the most important thing we have been discussing is the use of new and modern cars as a means of selling interest, enthusiasm and pride in our service, to our employees and public. That is a phase of the car situation which we have entirely overlooked in the past.

We have talked much of the need for co-ordination, but we are beginning to see more clearly a condition which calls for greater co-ordination within our own industry. I have always been a stanch advocate of the value of the service rendered the electric railway industry by the manufacturers and of the part they have played in its upbuilding. But today there is another group of manufacturers playing an active part. They represent the automotive point of view and automotive methods. They are setting a pace in merchandising effort with which the electric railway manufacturer is failing to keep pace. We are faced with new conditions. Our entire viewpoint is undergoing a rapid and deep-seated change. We operators are revising our conception of the transportation business and of our responsibilities to our properties and our public. We are trying out new tools, and we still have much to learn about how to co-ordinate them with those to which we have been accustomed. We have made many mistakes, and we shall continue to make them until we learn how to adapt ourselves and our methods to conditions that exist today.

In all of this the electric railway manufacturer has a primary interest and a primary responsibility. He furnishes the tools with which we work. Our success spells his success, our failure means failure for him. Operator and manufacturer are in the same boat. We float or sink together. If he permits new tools to be used where the old ones, properly improved, are better adapted; if he fails to keep his products up to the need of the times; if he hesitates to express frankly his views, or to invest money in the development of his product, he fails to meet his responsibility to the industry of which he is a part, and to his own stockholders. In the struggle to co-ordinate various vehicles into modern transportation systems the electric railway manufacturer must meet the development and merchandising aggression of his competitors. Only in that way will the car and bus finally be fitted together on a sound, economic basis. The electric railway manufacturer must tell his story frankly, even bluntly, if he expects to move ahead under modern conditions.

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*Abstract of address at the meeting of the Midwest Electric Railway Association, Tulsa, Okla., Jan. 6-7, 1927.

Something was said here today about the tendency to use our hearts instead of our heads in the consideration of buses and cars. We can't afford to do that. We must act on the basis of strict business considerations. Every precedent of the industry is subject to question in the light of changed conditions. The fact that we have always done a thing in a given way is good reason for questioning the wisdom of that practice.

Getting back to the bus, there is no question but that it is here to stay, and has a permanent place in the scheme of transportation. But in many instances it was introduced on the wrong basis. High-pressure selling was not always accompanied by wise merchandising. The bus manufacturer himself has not always properly analyzed the situation. Enthusiasm was and is being accompanied by much loose talk as to what the bus can and cannot do. There is danger that this may react against the proper development of the bus as a transportation agency on a basis which will permit it to be operated at a profit. The manufacturer who, in his eagerness for immediate sales, fails to consider the limitations as well as the advantages of the bus is storing up future trouble for himself and for every bus operator. We have talked much of co-ordination, but have made little progress in interpreting it into operating practice. There are buses in service today where they should not be operating. Many others have been installed under conditions which are subject to serious question as to character of service rendered and rate of fare charged. On the other hand, there are possibilities for bus operation that have hardly been tried. Co-ordination does not mean just putting some buses in service. Nor can a successful bus manufacturing organization be built by just selling buses wherever and whenever they can be forced into service.

WE ARE ACQUIRING A NEW VIEWPOINT

There is need for greater co-operation between manufacturers and operators in the development of the transportation business. There is increasing evidence that the electric car is economically the backbone of a properly co-ordinated transportation system. It should continue to handle the bulk transportation needs of our cities. Use of buses as street cars on rubber tires, for feeder and extension service is merely a stop-loss application suitable for thinly settled territory which will not support a rail investment. But there is a broader field for the operation of buses, particularly in the larger cities. The margin between street car fares and automobile operating costs and between street car service and automobile service is so wide that the bus offers an opportunity to develop entirely new business for a public transportation system by rendering a service which approaches more nearly than does the electric car that of the private vehicle. It is in that direction that the opportunity seems to lie for making bus operation really profitable. It is in that direction that the effort of the bus manufacturers should be directed, if their business is to be put on a sound basis. Only by making bus operation profitable can it be established on a sound foundation.

We, as transportation men, have a duty to the communities we serve. We are beginning to acquire an entirely new viewpoint in the discharge of that obligation. In the past we have thought merely as the producers of transportation. We have been primarily engineers. We have selected and operated our cars from an engineering viewpoint. Merchandising and salesmanship are not new words to us, but today they have a new significance as applied to our business. We are actually beginning to think more as merchants and less as engineers. Our big job is to develop and sell a product which will attract patrons. But the industry is far from doing the job which it should be doing, and which it will have to do before real success can be won. In the past our methods have been wrong. If that had not been the case we would not have had a hard luck story to tell. Our success in the future will be achieved by conducting our business differently than in the past. The process of improvement consists of the application of those methods and ideas which other companies have already found beneficial. We can't stand still. If we attempt it we shall continue to slide down, and finally out. When we go to conventions it should be to seek new ideas and suggestions, not to exchange our troubles. When we learn of ideas which have helped others, we must go back to our properties and find ways and means of applying them. Properties which have adopted a policy of progressive improvement of their service have made that improvement pay. The money spent for new cars and new facilities has been a profitable investment in every instance where it has been intelligently applied. In the experiences of those who have gone ahead in the last few years there is a real inspiration for the industry which points the way toward general improvement and financial success.

Curbstone Parking Can Serve Only a Few at Best

PARKING facilities on downtown streets are woefully inadequate at best, according to Dr. Miller McClintock, director of the Albert Russel Erskine bureau of Harvard University. A recent survey of seventeen American cities in which 1,424,660 automobiles entered the business district daily had curb space available for parking only sufficient to accommodate 147,081 cars.

In Chicago alone the Metropolitan Street Traffic Survey reveals the fact that the famous Loop in that city when used to its fullest capacity and with 100 per cent turnover every 30 minutes provided parking facilities for only 15 per cent of the 122,000 automobiles that daily enter this district. Storage garages and off-street facilities provide room for only 8,000 additional cars.

'There is no city in the country," declares Dr. McClintock, "that possesses curb space in the central district capable of accommodating the parked cars of more than a small fraction of the motorists who enter the district daily."

Dr. McClintock believes that the motor car is of sufficient importance as a means of transportation to warrant the provision of housing facilities at reasonable costs near the office or downtown destination of the driver and states in this connection that: "There is no more important improvement that can be undertaken to encourage the use of the automobile as a standard and daily means of personal transportation than for cities to encourage, either by public construction or by private means, the construction of storage space for automobiles near the center of the business district. There should be accommodation for every motor car that is brought into the city in some safe, off-street storage space."

Development of Commercial Sense Needed*

Modernization of Town and City Transportation Demands More than New Physical Equipment — A Large Amount of Business Can Be Developed, but It Requires the Right Attitude—Formation of Commercial Department Urged

By R. N. Graham

Manager of Railway the Pennsylvania-Ohio Electric Company,
Youngstown, Ohio

BEFORE the automobile existed there were communities too small to support a public transportation service. Communities where the entire area was easily within walking distance never presented a field for such enterprise. However, in those days, when a community expanded to such an extent that traversing the average distance between the residence portion and the business portion took too great a period of time or effort on the part of the individual, there immediately became a field for public transportation.

While the horse and buggy furnished a perfectly good conveyance, there was too much trouble and expense attached to its care to warrant the individual freely making use of it in preference to public transportation. With the great use of the automobile the field of public transportation in communities has narrowed. The community must be larger than under the former conditions. Even where a community is large enough to support a system of public transport, there is a large possible market which swings between the use of private automobiles and the vehicles of a public service.

Consider the typical urban community. A certain number of the people who live in it and whose livelihood is earned in the business center will walk from their homes to their work and vice versa. They are not customers of the public utility. A certain number live too far from the business center to walk and do not own automobiles; they will be customers of the public utility. A certain number live too far from the business center to walk but have their own automobiles; they may or may not be regular customers of the utility. Whether they are customers of the utility or not depends on several factors: (1) The service given by the utility; (2) the public attitude toward the utility; (3) the custom of the community; (4) the degree to which economic considerations are factors in determining choice of means of carriage.

I will not attempt to analyze all these factors but will content myself with a few general observations. The American people today do not examine closely comparative costs when these are small. If the private automobile is more convenient and comfortable than the public transportation system, the greater cost of the private automobile will not be a serious factor against it. On the other hand, the public is influenced by such factors as comfort, convenience, custom, prestige and even social consideration. If the public transportation offered is efficient and convenient, if it is considered snappy, modern and up to date, if the use of this public transportation does not constitute a social inferiority nor force the prospective passenger to mingle with undesirable companions, there is no reason why he should not avail himself of such service.

Therefore, in any community capable under any circumstances of supporting a public transport system, there is a large business which either may come to the utility or be withheld from it. For the purpose of this discussion, it is not even necessary for us to agree upon the factors involved. If there is such a business, it is manifestly the job of the utility to secure the maximum amount of it. Granted this, we must immediately concede that it is not sufficient for the utility to lay its tracks and operate its street cars and buses through the streets of the community and maintain its vehicles and facilities in an efficient and workmanlike manner. The transportation utility is engaged in a business in which a large proportion of the traffic that it will enjoy depends on the discovery and handling of factors which, to a large extent, may be individual and personal to the community it serves. It is engaged in a commercial venture whose prosperity depends on factors merchandising in their nature. Therefore, the first step in

> WE OPERATE buses in every city in which we furnish transportation. . . . As a result of our experience we do not consider the bus in any sense a successor to the street car and yet we consider it a useful part of our transportation system and a modern development of help to our operation. . . .
>
> We have discovered that the so-called rubber urge is simply a figure of speech. There is no apparent difference in the attitude toward our facilities in the portion of the communities we serve with street car lines and the portion we serve with bus lines. . . .
>
> On account of the low seating capacity of the bus with its comparatively high operating cost, the average length of haul which can be given profitably with a standard city fare is lower than with the street car, so that the street car must remain the backbone of urban transportation.—R. N. GRAHAM.

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*Abstract of a paper read at the meeting of the Midwest Electric Railway Association, Tulsa, Okla., Jan. 6-7, 1927.

modernization of town and city transportation with respect to the condition that existed before the present use of the automobile is the development of the commercial sense of the transportation organization.

On every transportation property, regardless of size, we will find a department head charged with the responsibility for the maintenance of equipment, another charged with the responsibility for the upkeep of track and permanent structures, another whose duty it is to see that the cars are operated according to schedule and in a proper and workmanlike manner. These duties and responsibilities have become so fixed through a long period that we expect to find such division of responsibility on every property. Taking the business as a whole these functions are carried on in an efficient, capable and modern manner.

However, the present need of the business is for an additional operating department, which can be termed the commercial department. It will be the function of this department to secure that business which may be given the utility or withheld from it. Naturally there will fall to this department the following chief responsibilities:

1. Development of the platform personnel of the organization to be not only efficient motormen, conductors or operators, but business getters.
2. Checking of the traffic that is carried and the traffic that can be carried, in order to adjust schedules to obtain the maximum amount of profitable business.
3. Preparation of schedules that can take care of the maximum amount of profitable business and that will best serve the traveling public.
4. Proper publication, announcement and posting of the scheduled facilities of the company to render it as easy as possible for the public to avail itself of the facilities offered.
5. Advertising of the facilities of the company through such mediums and in such manner as will best divert to the company the business that can be diverted.
6. Handling of all points of contact with the public in such manner as will make the relationship between the utility and the public as pleasant as possible, so that actual business shall not suffer through unfriendliness, prejudices or dislikes.
7. Development of such improvements in organization, equipment or practices as will be economically sound and at the same time either result in improved business to the utility or prevent loss of business already enjoyed.

This commercial department is at least of equal importance with the maintenance of way, equipment or transportation operation. In my opinion, it is of greater importance than any of the three mentioned and its head must be of at least equal caliber to those who act as heads of the departments conveniently considered necessary.

From this it will be evident that I consider that modernization of transportation does not consist of concrete acts such as purchasing new cars, putting up billboards, adopting a new uniform, or perhaps replacing a car line with a bus line. True modernization consists in changing the conception of the purpose of the particular utility to take care of certain business that must be carried to that of an aggressive sales organization which not only operates in an efficient mechanical way, but whose organization and manner of thought are directed to acquiring all the business possible.

With such a purpose and such an organization it will follow naturally that the concrete acts that have been or that may be suggested will be properly considered and weighed, will be adopted when such adoption seems feasible, but when adopted will not be unrelated desperate experiments or expedients, but will be followed up and continued as a definite and ordered business program.

THE general subject of advertising and publicity is concerned to a large extent with the general attitude of the public of a given community toward the transportation utility. The utility is there living with them; even though they are not its customers they see it and come in contact with it. They may view it as a decrepit, outworn institution, as something obsolete and passing, or as a live, vivid portion of the community's life. To secure this latter reaction is in general, I think, the real purpose of publicity.

—R. N. GRAHAM.

The commercial department of such a transportation organization, if functioning properly, will develop along the lines most proper to the field where it is working. There are a few general observations that I would like to offer along the line of modernizing transport:

On our Pennsylvania-Ohio system we have made rather sweeping changes in our physical plant in the past several years. We have embarked on a comprehensive bus system, overhauled a number of our operating practices and practically replaced all our street cars with more modern ones. However, among the numerous letters of commendation we have received there have been very few that have referred to these matters. These letters of commendation from the public almost invariably concern themselves with unusual acts of courtesy or thoughtfulness on the part of our working force. This illustrates the importance of the item of personnel. A street car may be very attractive in appearance, be kept clean and otherwise satisfy the passenger, but if the operator is surly or dirty, the impression left upon the passenger will be unpleasant. It is, therefore, as necessary to check the work of the operator from the standpoint of courtesy, cheerfulness and neatness as it is from the standpoint of safety and efficiency.

The commercial department should be able to classify the operators from the standpoint of their ability as business getters. Those operators who are disagreeable to passengers should not be permitted to remain in the business, regardless of their mechanical efficiency. An efficient and capable operator who does not possess the right mental attitude toward his job from the standpoint of attracting business should not be discarded without every effort having been made to enlist his interest and co-operation in this respect. I have found the booklet "Salesmanship" by George Baker Anderson, manager of transportation of the Los Angeles Railway, the best printed document on this idea as applied to motormen, conductors and operators. A booklet of this kind, couched in simple words, brief and suitable with respect to the local conditions of the property, should be in the hands of every platform employee.

The outstanding convenience of the private automobile in the control of a man to use in taking him from his residence to his work and back is that it avoids the necessity of standing on the corner waiting for a more or less indefinite period. This objection to the street car or bus facilities is, of course, eliminated when the headway is very close. In the small city or town the headway must be governed by good business economy. The public convenience of a close headway can be obtained where headways are long by informing the customers fully of the time they may expect the car to arrive at their corners. This, in turn, requires very careful scheduling and thorough advertising of such schedules. It also requires the use of intermediate time points and adherence to them. This further means that on any property, large or small, there must be a complete running check at all times of schedule at such time points.

On our system, our practice in this regard is so completely developed that on our suburban transportation lines the leaving time at each intermediate stop is shown on painted boards at these stops. We have changed headways on lines from one hour to two without diminishing our business.

Changes of routes and schedules afford a chance for unpleasant misunderstandings. For more than a year we have issued monthly a printed schedule book which is distributed at our stations, at hotels, clubs and other public places. A copy of this schedule is mailed regularly to any one requesting it on his letterhead. The mailing list for the schedule at the present time is about two thousand. In the schedule attention is called to the manner in which to secure such regular mailing.

Except in the largest cities, it is entirely practicable to have displayed in the car itself the schedules and time points of the line so that the people using the line can familiarize themselves with the scheduled leaving time of the cars from each time point. If the schedules are not closely followed, such information naturally will call attention to bad service. It consequently follows that the commercial department not only must have a complete check of actual operation of schedules, but must ascertain and report the reason for inability to fill properly devised schedules.

The general subject of advertising and publicity is concerned to a large extent with the general attitude of the public of a given community toward the transportation utility. The utility is there living with them; even though they are not its customers they see it and come in contact with it. They may view it as a decrepit, outworn institution, as something obsolete and passing, or as a live, vivid portion of the community's life. To secure this latter reaction is in general, I think, the real purpose of publicity.

Snappy, modern uniforms of whipcord; badges that are shapely and attractive; a coat of arms or other trade mark indicating that the utility wishes to establish a personality; cars which, while they may not be new, are at least kept bright and attractive with frequent lacquering; windows that are kept clean and polished; all these furnish a basis of the service to which attention can be called in many ways.

We have organized from our force an orchestra and quartet which, through constant practice, have become fairly proficient. A cheap scenic representation of a street car furnishes the background for this musical organization, which has appeared and is appearing before the luncheon clubs, improvement clubs and other civic organizations of our various communities.

On our suburban lines we have marked stations with electric signs, have placed on the highways zone markers in the shape of our coat of arms, and have freely used illuminated billboards. We do not anticipate that because some one reads of our service on a billboard or in the newspaper he will immediately put up his automobile to avail himself of our service, but we want every one in our communities to know that at any time they desire, they have a modern utility, aggressive and growing and eagerly desiring to be of service to them.

MODERNIZATION of transportation does not consist of concrete acts such as purchasing new cars, putting up billboards, adopting a new uniform, or perhaps replacing a car line with a bus line. True modernization consists in changing the conception of the purpose of the particular utility to take care of certain business that must be carried to that of an aggressive sales organization which not only operates in an efficient mechanical way, but whose organization and manner of thought are directed to acquiring all the business possible.

—R. N. GRAHAM.

There has been much discussion in the industry of the advantage of securing new and more comfortable equipment. From our own experience, I am unable to express an opinion as to whether in any case the financial returns would warrant the replacement of good, usable equipment with more attractive equipment, with the question of attractiveness the only purchase consideration. While practically all the rolling stock on our property has been newly purchased within the past seven years, in no case was the request for such purchase made merely on the basis of securing attractiveness. Our property was being changed to one-man operation and the controlling factor in the decision to purchase new cars was the ability to operate them with one man and to secure light weight. The economies to be gained dictated the policy of purchasing equipment.

However, in the case of our last city cars and interurban cars, the question arose of whether it would be advisable to purchase the light-weight, one-man equipment constructed as cheaply as possible, or, with additional outlay, to give greater comfort to our customers and provide better looking vehicles. The difference in price between the plainest cars we could buy and cars in which many elements of comfort and sightliness were incorporated was a comparatively small amount.

To receive the proper benefit in business from the additional cost, it is necessary that the cars be maintained with the same attention to appearance and comfort as when they are built. Otherwise, the money spent for comfort and appearance becomes a passing spasm, not resulting in permanent accession of good will and business to the utility.

The thought of modernization immediately brings up the question of buses. Probably most people outside the industry and a number in it consider the bus a successor to the street car. We operate buses in every city in which we furnish transportation. In the city of Youngstown one-fourth of our passengers are carried on buses. As a result of our experience we do not consider the bus in any sense a successor to the street car and yet we consider it a useful part of our transportation system and a modern development of help to our operation. Our city bus routes reach parts of the city that were not reached by our car lines. They enable us to give a complete service to all parts of our community when it would be impossible for us, with the exercise of good business judgment, to give the same service by building new street car lines. In some of our communities we were able to operate buses over certain routes on which we would probably never be able to build a street car line, yet the very giving of this service fills out the full measure of duty that as a transportation monopoly we owe these communities.

We have discovered that the so-called rubber urge is simply a figure of speech. There is no apparent difference in the attitude toward our facilities in the portion of the communities we serve with street car lines and the portion we serve with bus lines. On the sole route in the city of Youngstown on which, as a result of purchase of a competing certificate, we operate both street car and bus for the same city service, our bus line is little used. Yet our 72 city buses are a splendid adjunct to our transportation facilities.

On account of the low seating capacity of the bus with its comparatively high operating cost, the average length of haul which can be given profitably for a standard city fare is lower than with the street car, so that the street car must remain the backbone of urban transportation.

Therefore, in making use of this modern vehicle, which in itself is an efficient means of transportation, careful consideration should be given to its complete co-ordination with the existing street car system. The bus is not a substitute for street car service except under peculiar conditions that interfere with proper street car service. It serves no useful purpose as an alternate means of transportation on the same route and with the same rate of fare, but as a supplementary and co-ordinated means of transportation is a great step in the modernization of public transport.

The Readers' Forum

What Constitutes a "Pull-in?"

ELECTRIC RAILWAY ASSOCIATION OF EQUIPMENT MEN.
SOUTHERN PROPERTIES
MEMPHIS, TENN., Jan. 5, 1927.

To the Editor:

We note an editorial in your Dec. 18 issue, "Pull-in Comparisons Not Always Reliable." In the second paragraph you say:

> . . . Last summer at the Chattanooga meeting of the Southern Properties equipment men records of car-miles per pull-in were reported and published in the JOURNAL varying from 5,000 up to 98,000. It seems reasonable to suppose that the methods of determining pull-ins must vary widely in order to obtain such different results.

We wish to state that the members of the Electric Railway Association of Equipment Men, Southern Properties, have a standard classification, a copy of which is shown herein. Their rules for determining car pull-ins, which we have good reason to believe are strictly adhered to, are as follows:

> "A 'Pull-in' is a phrase used by the fraternity designating an equipment failure.
>
> 1. A car which has to be removed from service prior to completion of its regular prescribed run for any mechanical, electrical or man failure, or accident, will be termed a "Pull-in."
> 2. Should a car having a failure delay the car following, and even though at the end of the line is repaired or replaced by a tripper, such disabled car shall be termed a "Pull-in."
> 3. A derailment that ties up the line shall not be termed a "Pull-in" unless such car be considered defective and sent to the barn.
> 4. Should a car having a failure reach the end of the line without delaying the schedule of car following, and there be replaced by a tripper car, such will not be classed as a "Pull-in."

In the last paragraph of the editorial you say:

> For determination of the total record there is some background of opinion for counting every pull-in without reference to cause. These pull-ins can be analyzed to determine those arising from traffic accidents, shop failures or inspection failures. Even on this basis there will be some difficulty in determining a standard, although if no attempt be made to use the figures as a means of discipline much valuable information may be obtained from them.

Following is the list of items for analysis of failures which are used in the comparative statement of car pull-ins on the street car systems of the cities of the Electric Railway Association of Equipment Men, Southern Properties. These are given by months and cumulated for the year to the date of the report.

Chargeable to Carhouse. — Armatures; armature bands; armature shafts; armature bearings hot; axle bearings hot; commutator; brush yoke; brushes and holders; fields; field jumpers; motor leads; gears and pinions; gear cases; other motor trouble; trolleys; circuit breakers; line breakers; main fuse; controller; cables; rheostats; air brakes; safety car equipment; door engines; whistles; frozen air; other air troubles; lights; headlights; signal lights; door switch; heaters; electric bells; lightning; car charged; axles; wheels; journals and boxes; hot journals; hand brakes; slack adjusters; brake rigging; other truck troubles; doors and riggings; door treadles; windows; seats; steps; registers; signs; gongs; sand rigging; fenders; draw bars; snow scrapers; other body troubles; unclassified; total chargeable to equipment; total car-miles; average pull-ins per day; average miles per pull-in.

Not Chargeable to Carhouse. — Accidents; split switches; derailments; doors and steps; broken glass; trouble reported, none found; unclassified; total not chargeable to equipment; average pull-ins per day; average miles per pull-in; total pull-ins; total average pull-ins per day; total average miles per pull-in.

It will be noted from the above classification that it is divided. The first classification shows the mechanical defects, for which the mechanical department is held responsible. The second classification covers pull-ins for which the mechanical department is not held responsible. It is obvious that, with this classification, there should be no difficulty in determining a standard for car pull-ins.

We would appreciate your giving this statement space in your next issue of the JOURNAL, so that the industry may be familiar with the classifications as used by members of the Electric Railway Association of Equipment Men, Southern Properties.

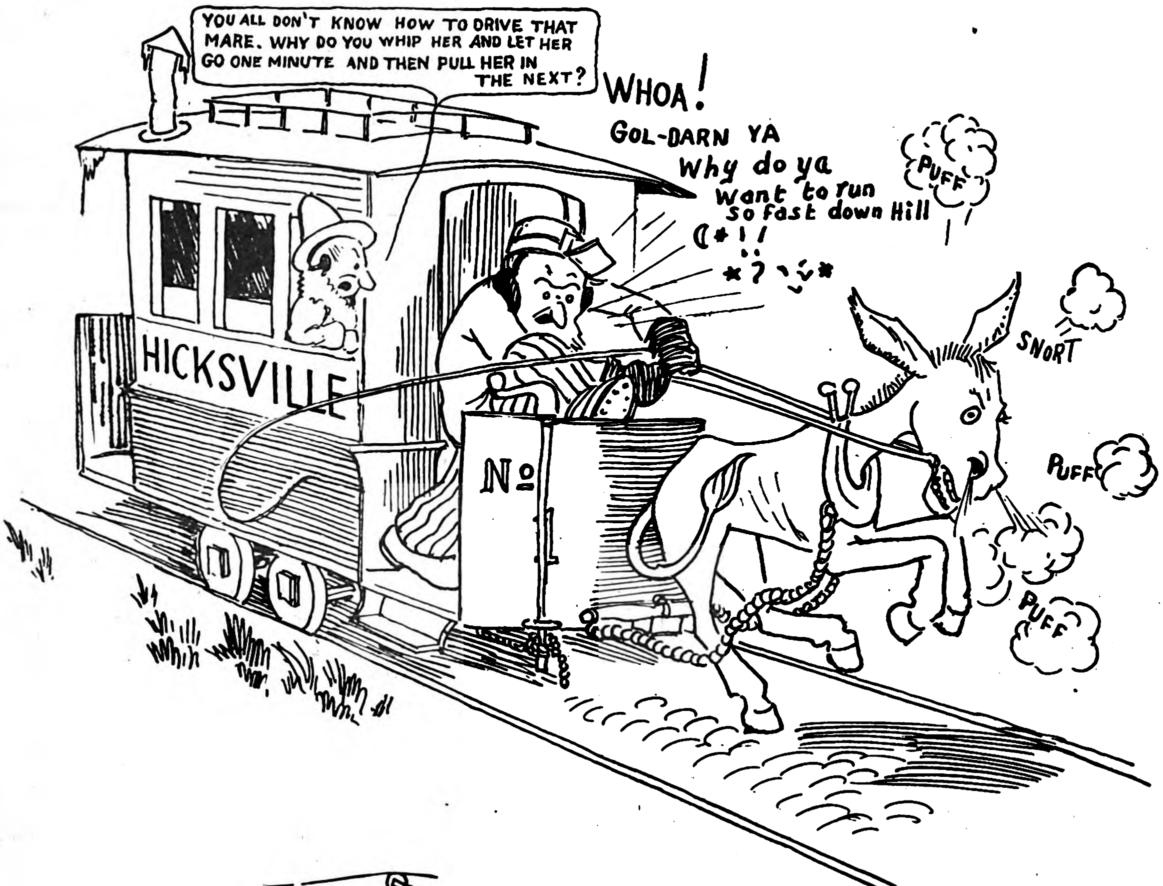
A. D. MCWHORTER,
President.

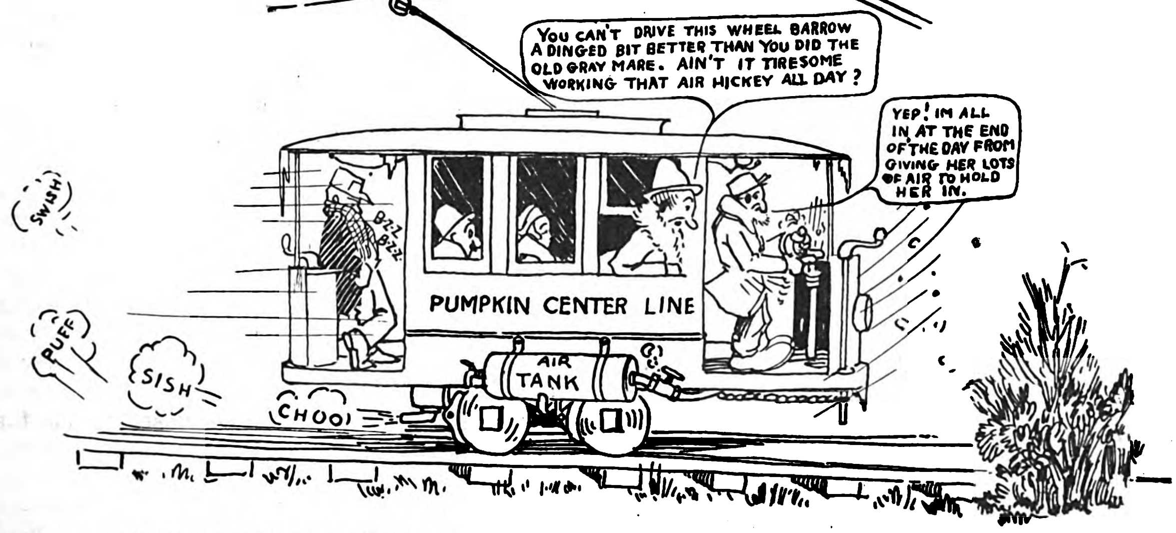
Adventures of
Old Man Trouble on the Hicksville Railway

Eliminate waste, reduce repairs and prevent trouble from worn air valves, governors and compressors by making fewer air brake applications.

There are many motormen who continuously all the way down a hill "monkey away at the air hickey" and make thirteen air applications to every car stop when under average conditions one is sufficient.

Save Air, Wear *and the* Old Gray Mare


YOU ALL DON'T KNOW HOW TO DRIVE THAT MARE. WHY DO YOU WHIP HER AND LET HER GO ONE MINUTE AND THEN PULL HER IN THE NEXT?
WHOA!
GOL-DARN YA
Why do ya want to run so fast down Hill
(#!!
?-√
PUFF
SNORT
PUFF
PUFF
HICKSVILLE
No 1


You CAN'T DRIVE THIS WHEEL BARROW A DINGED BIT BETTER THAN YOU DID THE OLD GRAY MARE. AIN'T IT TIRESOME WORKING THAT AIR HICKEY ALL DAY?
YEP! IM ALL IN AT THE END OF THE DAY FROM GIVING HER LOTS OF AIR TO HOLD HER IN.
SWISH
BZZ BZZ
PUMPKIN CENTER LINE
PUFF
SISH
CHOO
AIR TANK

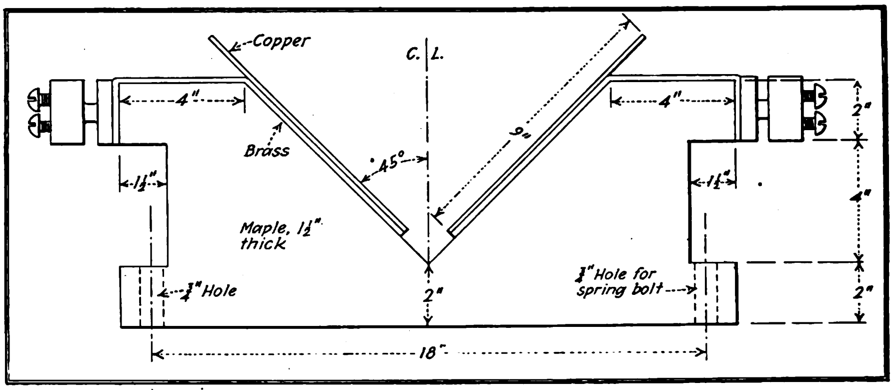
ELECTRIC RAILWAY JOURNAL will be glad to furnish proofs of this page free of charge for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

Designed by JESSE M. ZIMMERMAN, *renewal parts engineer, Sketches by* F. L. PROCTOR, *publicity department, Westinghouse Electric & Manufacturing Company.*

Maintenance Notes

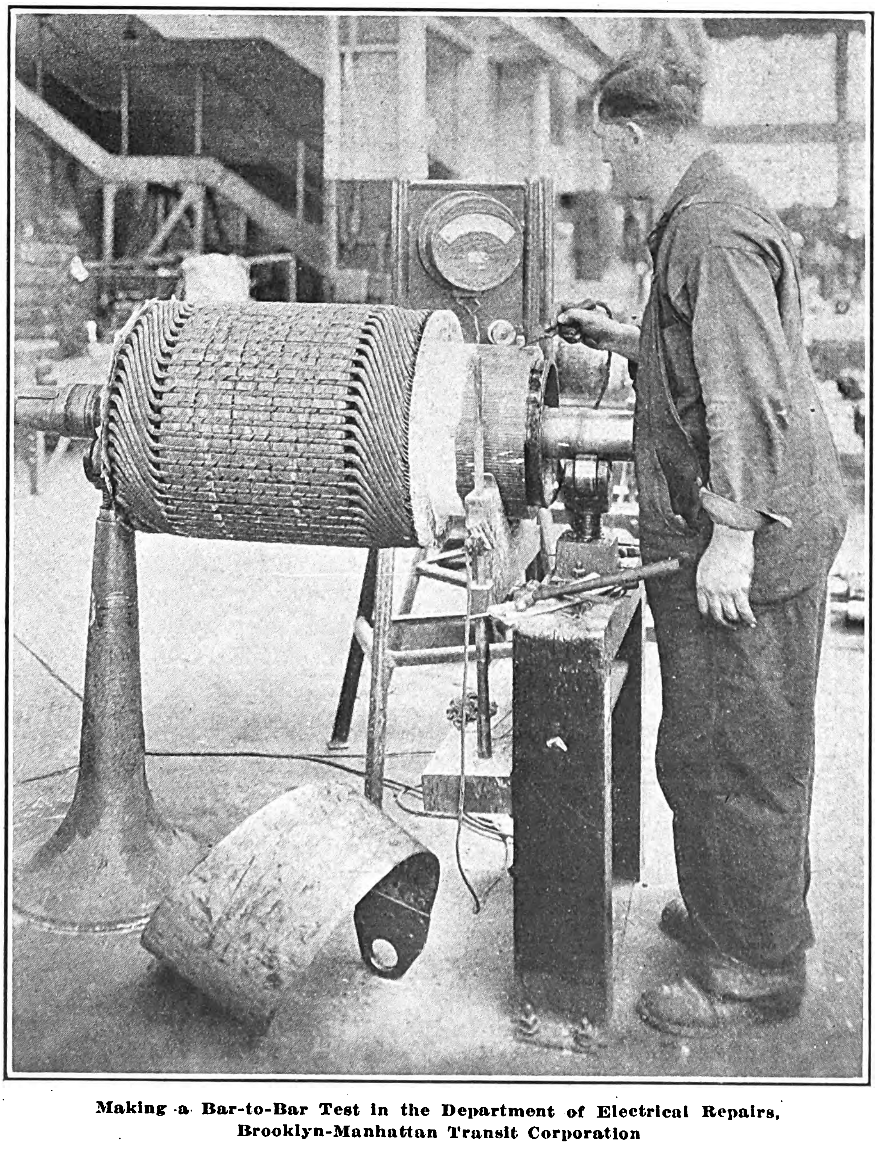
Convenient Contact Yoke for Bar-to-Bar Test

WHEN testing armatures by the bar-to-bar method it is common practice to connect the series circuit to commutator bars 90 deg. apart and then to explore the coils with a millivoltmeter, with its leads placed on two adjacent commutator bars.



Construction of Contact Yoke for Bar-to-Bar Test

For making the series current connections to the commutator bars a convenient type of contact yoke is used in the department of electrical repairs of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y. With this yoke, in making the bar-to-bar test, the commutator is placed so as to rest in the V-shaped section. Contact is made to the commutator bars by copper strips, one terminal being connected to ground while the other terminal connects to a bank of lamps the other side of which is connected directly to the line. An accompanying diagram shows the connections in the test as used. Four circuits of five 95-watt lamps each are in parallel. This gives about 0.8 amp. per circuit or a total of 3.2 amp. when all four circuits are connected. The current can be varied by cutting out one or more of the circuits so as to give a convenient deflection of the millivoltmeter. With the armature in position in the yoke the top quadrant is tested and then the commutator is turned to a new position.



Making a Bar-to-Bar Test in the Department of Electrical Repairs, Brooklyn-Manhattan Transit Corporation

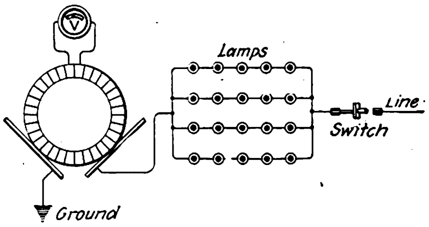


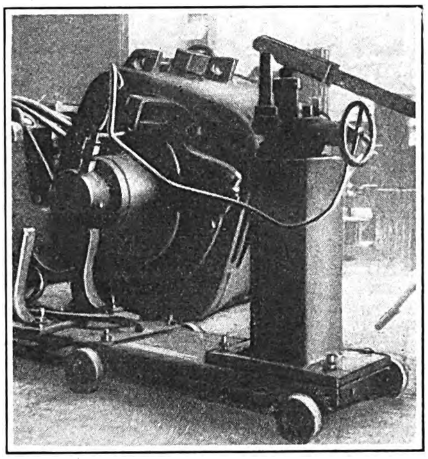
Diagram of Connections Used for Making Bar-to-Bar Test

An accompanying line cut gives the construction of the contact yoke which can be used for testing large armatures with commutators up to 19 in. diameter and for smaller armatures such that the commutator will not pass through the lower ends of the soft rolled copper contact plates. The two faces of the V-shaped notch are arranged accurately 90 deg. apart. Brass strips are screwed to the maple framework and the copper contact plates are soldered to the brass strips, the entire contact portion being held to the maple yoke by screws. The brass strips extend over the edges of the yoke and are provided with terminals for convenient attachment of the leads.

In order to provide pressure for the contact between the copper plates and the commutator the yoke is supported on springs. For this suspension two ⅝-in. bolts pass through the extended portions at the lower sides of the yoke and the suspension springs are carried around these bolts. The holes in the yoke for the suspension bolts are located 18 in. apart. For supporting the other end of the armature shaft an ordinary type of armature stand is used. This is adjusted so as to bring the armature shaft nearly horizontal when the commutator is placed in the V.

Pinions Removed by Hydraulic Puller

To simplify and hasten the removal of pinions the Interborough Rapid Transit Company of New York developed and is using a simple type of hydraulic puller built in the shop.

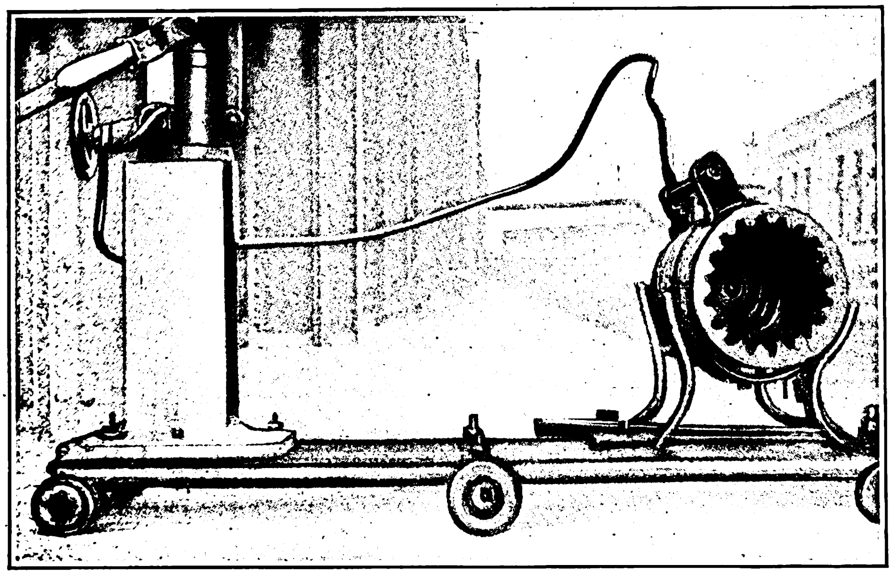


Puller in Position on Motor. Pressure Applied to Hydraulic Cylinder Forces Short Piston Against End of Armature Shaft

This machine consists of a small four-wheel truck upon one end of which is installed a pump pedestal with a hydraulic pump and on the other a pinion collar mounted on a small hydraulic cylinder. The pump and the hydraulic cylinder are connected together with a high-pressure pipe. Pressure in the cylinder may be released by opening a valve controlled by a small hand wheel on the pump pedestal. The pinion collar is bored larger than the outside diameter of the pinion to be pulled, except for a short section about ½ in. from the outer end. In this section are cut the same number of teeth as on the pinion to be pulled. Protruding into the collar from the hydraulic cylinder is a short piston of slightly smaller diameter than the pinion bore.

To remove a pinion the truck is rolled to position in front of the motor. The collar is then slipped over the pinion, its teeth passing between the pinion teeth. It is then given a turn to the right so that the collar teeth line up with the pinion teeth. The pump is then operated by hand. As pressure is built up in the cylinder, the short piston is forced out against the end of the armature shaft and the collar teeth pull against the back face of the pinion. Pressure is increased until the pinion is loosened. The collar is then turned back to the left, removed from the pinion and returned to the truck brackets.

Where various sizes of pinions are in service it is necessary to have a collar for each size.

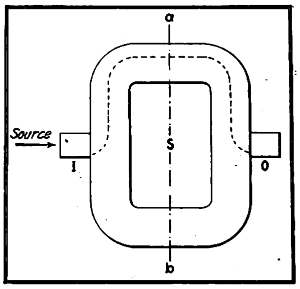


Hydraulic Pinion Puller Built in Interborough Shop. Arrangement of Teeth in Collar Is Shown at Right

Insuring Correct Installation of Motor Fields

Polarity tests for railway motor fields are not popular with repairmen. A number of railways have devised ingenuous methods for insuring that the fields when installed give the proper polarity, but few railways follow up this testing consistently. In most cases familiarity of the motor repairmen with the various types of fields and connections are relied upon to insure that they are installed properly. Mix-ups in motor fields occur most frequently with those types which can be reversed either end for end or front side for back side.

There are no standard arrangements that can be applied to all field windings. In the more modern types of motors it has been necessary to place the field terminals at the ends of the coils in order to provide clearance for the commutating coils. By the use of open and crossed coils the wiring around the frame of the motor is simplified, but this method requires carrying in stock two types of coils, which adds to the chance of getting the coils mixed when a damaged field is repaired. It is now considered the best practice by railway manufacturers to use cables which come out of the body of the coils instead of employing heavy brass terminals to make the wiring around the frame. The use of this type of coil, however, does not overcome the difficulty of having fields whose proper position in the motor



With Current Entering at "I" a South Pole Will Be Produced

Too little motor end play may cause a car delay; too much motor end play and there's H... to pay.

cannot be determined. Some sort of marking is evidently essential in order to reduce the number of troubles which occur from this source.

As an illustration of the ease with which some types of coils can be installed improperly and the effect which results from installing a new coil in a wrong position an accompanying diagram is shown. This is for a common type of railway motor field coil and the dotted line represents the winding as connected to the two terminals located at the center of either side. If a sketch of this nature be made on transparent paper this can be turned to various positions to show the effect of installing a field coil improperly and is an excellent method of demonstrating to repairmen the wrong effects that will result. With the field coil in a position as shown in the sketch, if the current enters the coil in the direction shown by the arrow, clockwise current will result in the winding, which will produce a south pole at the inside surface of the pole face. If the coil be swiveled around end for end in its own plane, the terminal *O* will become the source of power, so that counterclockwise current will result and a north pole will be produced. If the coil be rotated on the line *a-b* as an axis, the terminal *O* will again be the source of power, but the current in this case remains clockwise and the pole produced is south. Rotation of the coil around an imaginary line *I-O* as an axis gives the same effect as swiveling the coil in its own plane; that is, current circulation becomes reversed, and with it the polarity is changed.

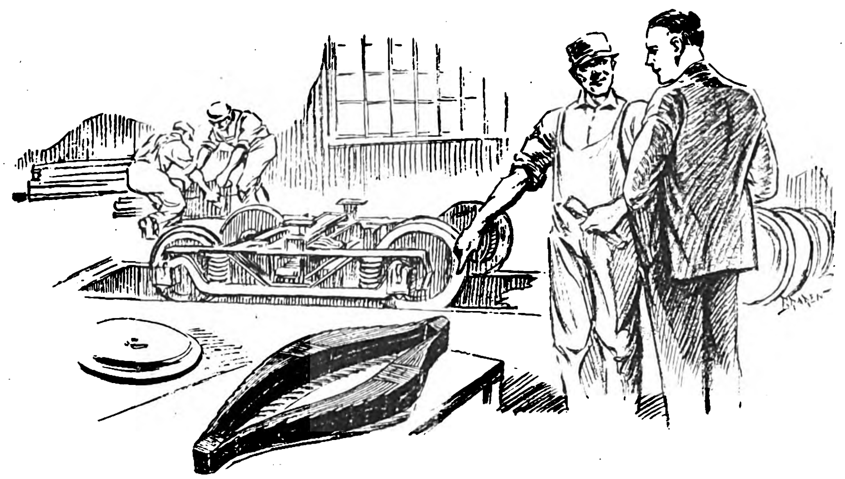
Such a sketch as this can be made up for each type of coil used by a railway and it is particularly applicable to the demonstration of coils, the terminals of which are located both on the same end, or one front and the other rear. Also for compound wound coils which have terminals both at the ends and at the sides, such a sketch makes it easy to show how a mistake in installing the coil may result in reversing one winding without reversing the other.

The principal method which has been used successfully so that a field coil will not be installed improperly is to mark the terminals and to have the holes for the screws which clamp the leads so located that they will indicate which is the top or bottom side of a coil. The practice of the General Electric Company is to mark the two terminals of a field, one *I* and the other *O*. This terminology means inside end and outside end, or, as some railway repairmen have shortened this, "In" and "Out." The Westinghouse Electric & Manufacturing Company uses the letters "F" and "R" to indicate "Front" and "Rear" respectively. If this marking is carefully maintained and the repairmen are made familiar with it trouble from swiveling coils around in their own plane should be reduced.

To prevent coils being turned bottom side up, probably the most effective method is to put screws in only on the top side, so that if the coil is installed bottom side up it will be quite difficult to reach the screws and so to tighten the leads. This requires, however, two types of terminals, and on some railway systems this is considered a particular disadvantage. However, terminals in general are small parts and the carrying of a few more in stock will be more than offset by the damage which will result from wrongly connected fields.

Dick Prescott Discusses a Spring Substitute

And Discovers Bad Practice



DICK PRESCOTT, assistant shop superintendent of the Consolidated Railway & Light Company, was interested immediately in the presence of the wood block under the center bearing of the truck he was inspecting. Joe, the workman in charge of the overhaul gang, looked up as Dick asked the reason for the wood block.

"They put them blocks in there to raise up the body so the brake pull rods don't drag on the motors," he replied.

"Well, are they in there when the cars are new?" asked Dick.

"No, the springs ain't sagged then."

"How much of that do we do?" continued Dick. "Are there blocks like that under most of the cars?"

"Sure, they've nearly all got blocks under the center bearings," Joe replied. "Some of 'em have two blocks when the springs get very bad. Sometimes they put some on top of the journal boxes too."

"While they are trying to get plenty of clearance that way, doesn't that boost the bodies up and make the steps too high?" Dick asked.

"Yeh, sometimes they get pretty high," replied Joe.

"That certainly looks like bad practice to me," continued Dick. "There must be something the matter with our springs."

"We tried getting 'em higher," volunteered Joe. "These full elliptics now are two inches higher than they used to be, but they sag right down and git too low."

"That's funny," commented Dick. "Did they lengthen the bolster links when they put in the higher spring?"

"No, we didn't need to make 'em longer. All we do is t' press down the spring and put the pin in the links."

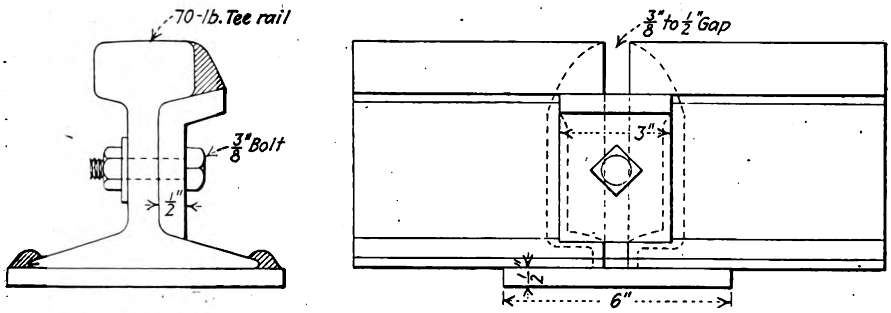
"Oh, I see," said Dick. "But that doesn't help the situation a bit. All you do is put a heavy initial load on the spring when you assemble the truck. So you get very little, if any, spring action for a light car body. Then when the load goes on you probably exceed the elastic limit of the spring and it begins to sag. As a result we get rough riding cars when they're light and then stick in these blocks to try and keep the bodies up off of the motors. Who specifies the design of our springs?"

"Why, the storeroom jest sends out samples," Joe replied.

"Oh, I see," exclaimed Dick. "That's where the trouble is. We don't know anything about the capacity of the springs we're putting into these trucks. Do we have any drawings of the various types we use?"

"I never seen none," replied Joe.

Rail Joints Welded with Small Plates



Rail Ends Are Separated and the Intervening Space Filled with Welding Metal in This Type of Joint Developed by the Bangor Hydro-Electric Company

GOOD results have been obtained by the Bangor Hydro-Electric Company, Bangor, Me., through the use of an electric welded joint in which small plates are employed to carry the welding metal. Rail ends are separated by a ⅜ to ½-in. gap. A joint plate 3 in. long is held in position by a ⅜-in. bolt passing through this gap and secured on the far side by a washer and nut. Underneath is a base plate 6 in. long.

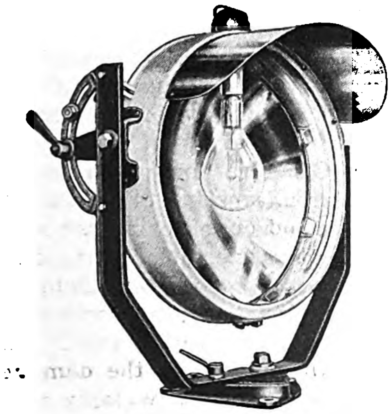
First the joint is lined up and crowned slightly. Then the base plate is caught by welding all four corners to the bases of the rails. The gap between rail ends is filled, starting at the base and welding up through the web, and at the same time welding through onto the center of the side plate. This is continued until the joint has been welded well up under the head of rails. Then the base plate is welded by starting at the center and welding each way on both sides of the base. This is done with a single heavy layer. The next seams to be welded are those of the side plate. This is done with a single heavy layer as indicated by the dotted lines on the accompanying sketch. Then the gap between the rail heads is welded and the shelf formed by side plates is filled.

This type of joint was designed by the foreman of the welding crew. After three years of service no signs of pounding out or cupping have been noticed.

New Equipment Available

Floodlighting Projector for Long-Range Service

GOLDEN GLOW floodlighting projectors of 24-in. diameter have been placed on the market by the Electric Service Supplies Company, Philadelphia, Pa. The new projector is known as type FLA-2430 and is to meet service conditions such as imposed by the longer railway yards where space for tower location is available only at either end of the area to be floodlighted. This new unit projects a long-range beam of high intensity.



New Projector Which Provides Both Vertical and Horizontal Adjustment

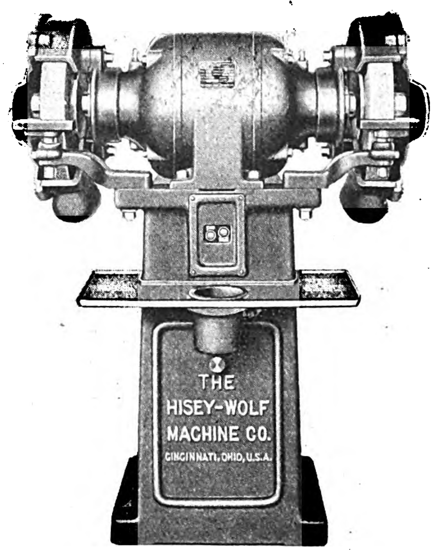
These floodlighting projectors consist of a cast aluminum alloy case, approximately 3/16 in. thick, equipped with a hinged rear door made of the same material and in which a 24-in. diameter "Golden Glow" or crystal mirror glass reflector is flexibly mounted.

The front of the lamp is regularly equipped with a molded convex lens made of special heat-resisting and annealed glass, approximately ¼ in. thick. The lens is also held in position by flexible retaining clamps, thus resulting in the practical elimination of breakage. The focusing device permits adjustment in both the vertical and horizontal planes. This focusing device is mounted at the top for use with PS-52 floodlighting lamps or at the bottom for use with G-40 lamps, where a highly concentrated beam is desired.

The focusing device is fitted with a Mogul socket. It is adapted for use with standard 1,000 to 1,500-watt type "C" Mazda lamps with the PS-52 bulb for regular floodlighting, or the 1,000-watt type "C" Mazda lamps with the G-40 bulb for highly concentrated long-range work. The over-all height is 37 in., over-all width 34 in., weight 125 lb. The entire unit is mounted on a swivel trunnion, allowing for directing the beam of light in any direction and with provision for locking firmly in position.

Motor-Driven Grinding Machines

MOTOR-DRIVEN double-end grinding machines, buffing and polishing machines, with both open-type and incased-type spindle extensions, are being offered in a complete new line by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The driving motors are arranged for both alternating and direct-current service.

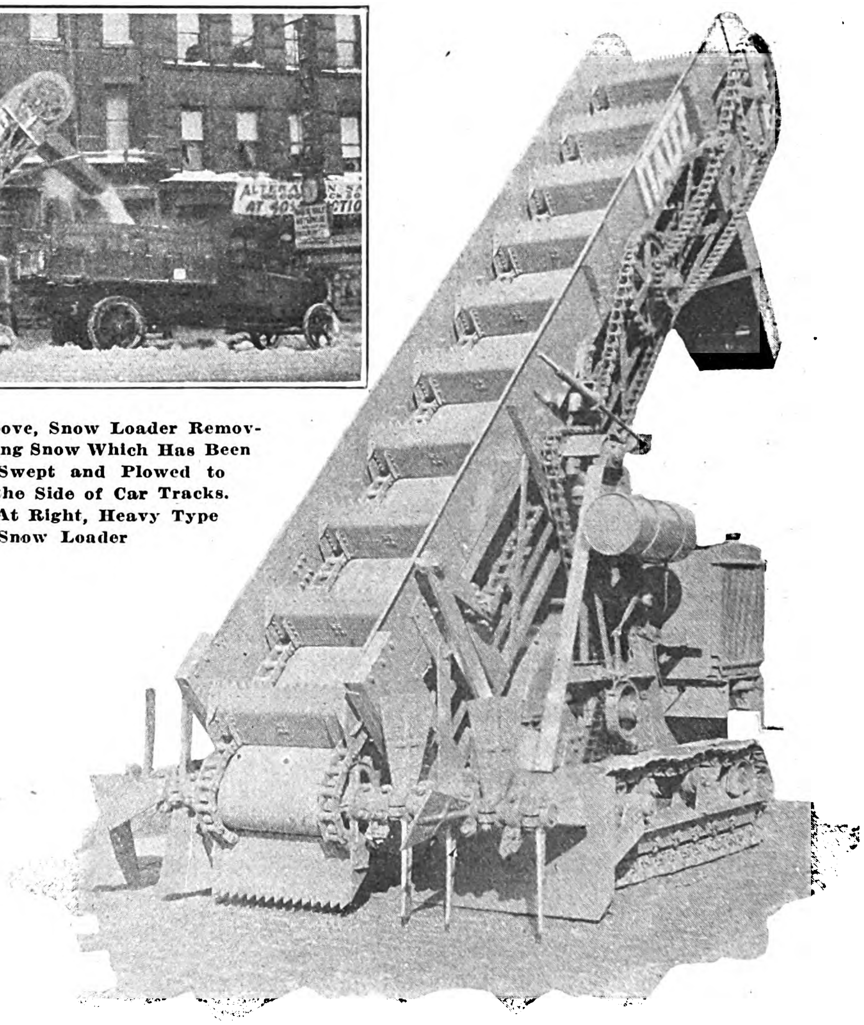


Floor Stand Grinder with Two Grinding Wheels

Some of the improved details which have been incorporated in this line of machines are high-grade oversize ball bearings mounted in end heads in close proximity to the wheels. Buffing and polishing machines with incased-type spindle extensions are equipped with four ball bearings. It is recommended that the bearings be lubricated with a good grade of oil, and after the bearing chamber or oil reservoir is once filled it should last for two or three months under ordinary service. Oil chambers are provided with flush or drain-out plugs to permit an occasional cleaning. Wheel guards are adjustable to the wear of the grinding wheel.

A Big Capacity Snow Loader

SNOW removal is an important and costly item of the winter's work of electric railways and a great deal of engineering knowledge has been applied to devising mechanical devices to lessen the time and labor required for hand shoveling. Snow-loading machines have been on the market for two or three years, but every season sees improvements and the development of new designs. A new type has been brought out this year by the George Haiss Manufacturing Company, New York, N. Y. The Haiss company's portable bucket loaders are said to have proved to be capable machines for digging and loading sand. It has been natural for that company to adapt the sand loader to snow loading, although this has involved the design of an entirely different style of elevating mechanism.



Above, Snow Loader Removing Snow Which Has Been Swept and Plowed to the Side of Car Tracks. At Right, Heavy Type Snow Loader

The new snow loader is a creeper-tread-mounted machine with a 37-hp. Waukesha motor and a heavy set of transmission gears and clutches, all housed in one case and running in oil. The snow elevator is a flight or scraper conveyor, with the high flights built as heavy as the buckets used for crushed stone. Quarter-inch steel plate is used with toothed reinforcing edges and side plates, which also brace the bottom of each flight unit. These flights are shaped to prevent dry snow from rolling back over their upper edges. The flights are bolted at each side to endless chain belts which carry them up the elevator at a speed of 140 ft. per minute. Each flight as it comes in contact with the bottom of the snow pile presents its toothed edge at the most effective angle for cutting effect.

Revolving paddles are used for feeding materials from the sides toward the center of the machine. In addition the snow loader has a clean-up scraper immediately behind the paddles to push any spillage back into the pile which is being loaded. The recent 7-in. snowfall in New York gave an opportunity for a thorough test of this machine. The local traction company had plowed and swept the snow from its tracks into windrows 2 ft. high and 7 or 8 ft. wide. The snow was fine and dry, not at all adhesive and, therefore, most difficult to handle. A fleet of five trucks with high sides was gaged each to carry 8 yd. per trip.

With five trucks available the loader put up 100 loads in nine hours. No truck loads were timed to take longer than 1½ minutes and a number were loaded in 60 seconds, or at a rate of nearly 10 yd. a minute. The loader was idle two-thirds of the time waiting for the trucks to dump and return. With ten trucks it would have been easy to put up 200 8-yd. loads in nine hours.

Reduce the "static" in your equipment and improve its reception, by careful tuning and adjusting.

New Features in Recording Instruments

FOUR new features have been incorporated in the General Electric Company's CR type round pattern recording instruments. The new pen is of greater capacity, with a glass body and metal stylus, and can be refilled without impeding the operation of the instrument. There is a new shipping device, operated by turning a knurled knob on the back. A new polarizing adjustment, by which the instrument calibration can be altered, can be locked in any desired position. There is also a new suspension link of indestructible character, which retains the calibration and sensitivity of the instrument.

The CR recording instruments, for either alternating or direct current, are available for switchboard mounting or as portable instruments. The ammeters are for 5 to 200 amp. and the voltmeters are supplied for any range from 0 to 750 volts. The charts, 8 in. in diameter, are driven by one-day or eight-day clocks or by Warren synchronous motors.

Association News & Discussions

Midwest Association Discusses Service Improvement

DURING a two-day session in Tulsa, Okla., on Jan. 6 and 7, a preliminary report of which was published in this paper last week, the Midwest Electric Railway Association devoted its attention to discussion of ideas for the improvement of service and the development of business. The experiences of representative properties which have made progress and won their way back toward a favorable financial showing were analyzed with a view toward their application on roads which are still in serious difficulty from the standpoint of traffic and revenue.

This kind of collective thinking developed a lively discussion of each of the papers and addresses on the program. The meeting was characterized by the presence on the program of representatives from properties that have won a substantial degree of success, and a decided note of optimism grew out of this first-hand testimony by men whose properties have already profited by the application of modern operating ideas and practices.

R. N. Graham, manager of the railway properties of the Pennsylvania-Ohio System, winner of the 1926 Coffin Award, was one of the headliners on the program. In a paper abstracted at length elsewhere in this issue, he marshaled together the principles on which the success of his property was built. He interpreted modernization to mean more than merely bringing the physical property up to date. This he held to be an important and essential part of an improvement program, but only the first part. He insisted that a railway property must go much further in order to win a substantial number of riders from those who have a choice between the use of private and public transportation. He interpreted modern transportation salesmanship to mean the acquirement of a true commercial outlook on the part of the entire operating organization from management to platform employees. He recommended the advantages of a special commercial department, in which the building of business and the training of transportation salesmen should be the primary responsibilities.

Supplementing Mr. Graham's paper was an address by Charles Gordon, editor ELECTRIC RAILWAY JOURNAL. presenting the equipment situation from the standpoint of the industry as a whole. Mr. Gordon's discussion was illustrated with lantern slides showing the experience of several properties which have made progress in modernizing their equipment. This was translated into an estimate of the economics of the car situation in the entire industry, by a comparison of operating costs on groups of properties with and without modern cars. From these figures it was shown that the industry could buy approximately 12,000 new cars per year out of the excess operating costs attributable to the continued use of rundown and obsolete equipment.

MR. SAWYER DRIVES HOME MODERN IDEA

The climax to the meeting was reached in a straight-from-the-shoulder address by W. H. Sawyer, president American Electric Railway Association. Mr. Sawyer did not mince his words. He introduced his remarks by pointing to the need for plain speaking in the industry. He cited the need for co-operation among transportation companies in the solution of their common problems and complimented the Midwest Association on the excellence of its program and the evidence of renewed interest and enthusiasm shown by the active discussion during the meeting. The opportunity thus afforded to railway men for the interchange of ideas and experiences he held to be the primary advantage of state and sectional associations. In such meetings time is available for a detailed discussion, which is obviously impracticable in a national meeting. While thus commending the purpose and activities of the sectional associations, he made a strong plea for co-operation on the part of all railway men in the work of the national association. "The American Association's policies are carried out by men who have been willing to give of their time and energy in the service of the industry," he said. Only with the co-operation of the industry itself, however, can the work of the national association be made really effective and helpful. He urged that all railway men take a part and an interest in the association's work, and make suggestions for improving its policies whenever such changes seem to be desirable. Mr. Sawyer explained further that association committees are selected with a view to picking men who will actively take part in the work. He pointed out that the results of this effort are not utilized by the industry as they should be and made a strong plea for greater utilization of the association's facilities by all member companies. An abstract of Mr. Sawyer's address is printed elsewhere in this issue.

COMING MEETINGS OF
Electric Railway and Allied Associations

Jan. 18—American Society of Safety Engineers, annual meeting, Cafe Boulevard, New York City, 6:30 p.m.

Jan. 19-20—Central Electric Traffic Association, Keenan Hotel, Fort Wayne, Ind.

Jan. 21-22—Central Electric Railway Accountants' Association, Fort Wayne, Ind.

Jan. 25—New York Electric Railway Association, winter meeting. Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men — Southern Properties, Peabody Hotel, Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

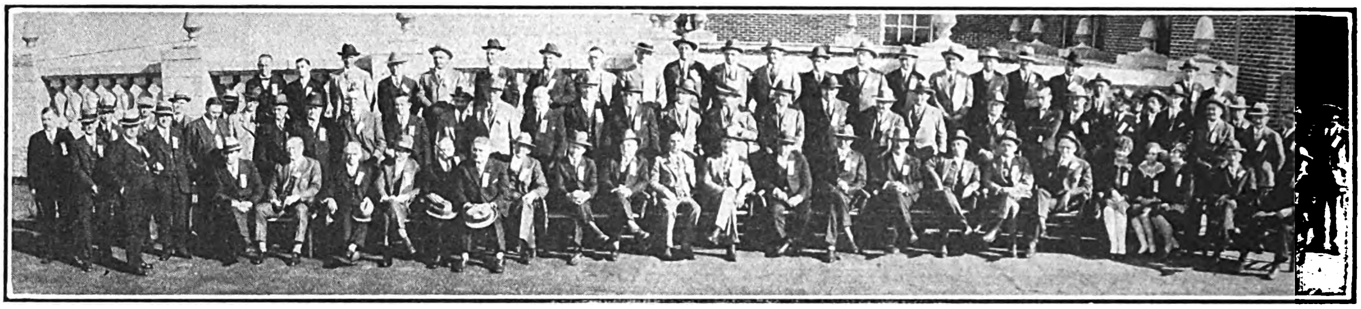
Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

Public relations, popularizing of electric railway service and advertising were handled in papers by Edward F. McKay, manager Oklahoma Utilities Association, and J. B. Donley, assistant commercial manager Pittsburgh Railways. Mr. Donley's paper will appear in abstract in a later issue. Mr. McKay took an unusual angle in presenting the much-discussed subject of public relations. Taking scripture as his proof of the fact that human nature has not changed in its essentials these many centuries, he explained that little new can be said on the subject of public relations. On this point particularly he held that actions speak louder than words. "Performance," he said, "rather than promises, proclaims public relations, and in a language that the public is certain to understand." To emphasize this further, the speaker said that public relations consists in being, not pretending to be, what we ought to be.

Modernization of the interurban railway was discussed by J. M. Bosenbury,



Midwest Electric Railway Association Meets in Tulsa, Okla.

superintendent of motive power Illinois Traction System. The speaker described the methods used on his property for building up carload freight business, pick-up and delivery express and passenger revenue. In all of this work improved equipment and facilities played an important part in providing a character of service which could be successfully merchandised. Intensive selling effort, backed up with widespread advertising and the enthusiastic co-operation of every official and employee on the property, was responsible, according to Mr. Bosenbury, for the success achieved.

Passenger service was improved by the inauguration of the "Tangerine Flier" service with remodeled and repainted cars fitted with semi-parlor car interiors and operating on much faster schedules than had formerly been run. Freight traffic was built up by intensive solicitation of business, negotiation of interchange agreements with steam railroads, provision of more freight equipment and specially designed locomotives with increased capacity but arranged so as to negotiate the short-radius curves on the system and at industrial sidings. Additional substation capacity and belt lines around important cities permitted longer trains to be handled and thus decreased the cost and increased the efficiency of freight handling. Improved signals helped further to expedite movement of traffic. Prompt operating reports helped to check the performance of the entire organization from day to day. Special light-weight and attractive motor trucks enabled the company to undertake the development of pick-up and delivery business at standard express rates. Combined with all of this, co-operation between departments and team work brought about the desired increase in business. Committees were appointed during the progress of this campaign for more revenue, to study conditions and to assist by reports in the development of new operating and merchandising ideas.

New York Electric Railway Association's Mid-Year Meeting

MORNING and afternoon sessions will be held at the mid-year meeting of the New York Electric Railway Association at the Commodore Hotel, New York, on Tuesday, Jan. 25. In addition, the usual banquet will be held in the evening. The morning session will begin at 10 a.m. and the afternoon session at 2 p.m. There will be an intermission for luncheon.

Four papers are to be presented at these sessions, as follows:

"Modern Inventories and Purchasing Methods," by Samuel Porcher, assistant to the vice-president Pennsylvania Railroad."

"Accident Prevention," by H. K. Bennett, safety manager United Electric Railways, Providence, R. I.

"Improvements in Cars and Car Maintenance," by W. C. Bolt, superintendent rolling stock and shops Eastern Massachusetts Street Railway.

"The Accounts, the Auditor and the Operating and Executive Organization," by H. D. Chamberlain, auditor Delaware & Hudson Company.

It is expected that each of these papers will be followed by discussion.

The afternoon session will conclude with a series of moving pictures showing methods of the manufacture of steel wheels, axles, etc., to be presented by George A. Richardson of the Bethlehem Steel Company.

Those intending to attend the banquet in the evening are urged to make their reservations promptly. Tables will be arranged to accommodate eight or ten people. The price of the dinner will be $7.50 per plate, and check should be inclosed with any request for reservations to cover the number of places desired. Request for reservations may be made to the secretary, W. F. Stanton, 267 State Street, Rochester, N. Y., or to any member of the dinner committee, as follows: A. L. Hodges, chairman, Brooklyn City Railroad; H. M. Norris, Interborough Rapid Transit Company; Joseph R. Ellicott, Westinghouse Traction Brake Company; T. R. Langan, Westinghouse Electric & Manufacturing Company; John J. Jordan, Brooklyn-Manhattan Transit Corporation; Ross F. Hayes, 30 Church Street, New York, and W. B. Wheeler, Third Avenue Railway.

Birney Club Elects

ONE-MAN operation, safety devices and modernized cars were the topics considered at the annual meeting of the Birney Club of St. Louis, held at the Missouri Athletic Club on the evening of Jan. 3. E. B. Meissner, president St. Louis Car Company, presided. R. S. Frehse, sales engineer National Pneumatic Company, opened the program with a paper entitled "Circulation of Passenger Load with One-man Operation."

New officers were elected for the coming year, as follows: President, F. A. Richards, vice-president American Car Company; vice-president, E. A. Roehry, general manager St. Louis Electric Terminal Railway; secretary, B. W. Stemmerich, division manager Westinghouse Electric & Manufacturing Company; treasurer, O. E. Turner, special representative railway department, General Electric Company.

American Association News

Making the Railway Popular

NEW traffic can be created for the electric railways and a large measure of public good will can be secured by intelligent energetic efforts, according to the speakers at a meeting of the Metropolitan Section, American Electric Railway Association, held Jan. 7 at the Engineering Societies Building, New York City. "Popularizing Service" was the subject of the meeting, which was in charge of J. T. Hamilton, chairman of the sponsor group committee for the evening.

Traffic and transportation conditions in Europe and in the United States were compared by Lucius S. Storrs, managing director American Electric Railway Association, the first speaker. New cars are being designed in London, Mr. Storrs said, with special attention being paid to popularizing the service. Paris also is experimenting with new cars. Operation of buses by the railway management in districts where no rail facilities exist has done much to win public favor.

Co-ordination of transportation facilities rather than competition is the endeavor throughout Europe, Mr. Storrs said. He cited Berlin as being probably the best example of co-ordinated service. Transportation authorities in that city have adopted as a hypothesis the existence of rail routes without rolling stock and have attempted to visualize the type of car which should be built under such circumstances. Mr. Storrs thought it would be helpful to attempt a similar visualization in American cities by assuming the existence of no transportation facilities whatever and theorizing as to the kind of system which should be created.

L. S. Miller, president New York, Westchester & Boston Railroad, said that "popularizing" is a difficult word for a slogan. He mentioned three characteristics of the American public which should be borne in mind by railway men. These are intelligence, fairness and an unwillingness to have anything "put over." In the past public relations have been conducted too often by lawyers and not enough by the operating men. This situation, however, is gradually changing for the better. "Give service before preaching it," he said. A smile goes a long way to popularize the service. Personal contact with the patrons is extremely valuable. While this existed in former days, it was lost to a large extent after the consolidation of smaller companies into big systems. General policies dictated by the head office of a large system may not always serve local conditions.

W. E. Thompson, vice-president Third Avenue Railway, New York City, spoke of the efforts being made by his company to secure public good will. Radio broadcasting has been effective, he said. C. E. Morgan, vice-president and general manager Brooklyn City Railroad, emphasized a point brought out at a previous meeting of the Metropolitan Section, that the public is interested only in the quality of the service furnished, not in the difficulties encountered by the company in providing that service. He said that a railway passenger is just like a customer in a store, that he favors goods offered in an attractive-looking package and that this thought should be borne in mind in connection with the rolling stock. C. J. Norstrand, general manager Jamaica Central Railways, told of the efforts being made by his company to build up traffic.

Effective methods of dealing with the public were outlined by Leonard Ormerod, advertising manager Pennsylvania Bell Telephone Company. He said that courtesy on the part of the railway employees often demands a considerable effort. At the end of a long, tiresome day it is not easy to greet the patron with a smile. Only by sustained effort can this kind of friendly relationship be maintained. Personal relations between the employees and the public should be augmented by proper advertising, he said. In this connection he stressed the importance of having advertising copy properly represent the company. Cheap advertising is a poor economy, in his opinion. The public is discriminating and judges the advertiser by the quality of his advertising matter.

Traffic and Safety

CONDITIONS of competition for the Anthony N. Brady Memorial Medal formed the principal topic of discussion at a meeting of the committee on traffic and safety held at association headquarters, New York City, Jan. 13. It was the consensus of opinion that it would be impracticable for electric railways at present to comply with the original conditions laid down for this award. The suggestion was made that the award be based on answers to certain simple questions propounded by the committee following the general lines of the Charles A. Coffin Award, and on accident records similar to those reported to the association. It was thought that all transportation facilities operated by a railway or any affiliated company should be included. Recommendation was made that the silver and bronze replicas provided for individuals be dispensed with. After hearing this expression of views of the committee on traffic and safety, T. Fitzgerald, chairman of the committee to formulate conditions, prepared an outline which received the indorsement of the former committee.

A sub-committee was appointed to study the classification of accidents being made by the electric railway section of the National Safety Council. Study will be made during the coming year of recent traffic investigations in Chicago, Baltimore, Detroit, and elsewhere. Copies of the article in ELECTRIC RAILWAY JOURNAL for Jan. 8 outlining the Chicago traffic study are to be distributed to all members of the committee, along with an index of similar studies abstracted in the JOURNAL.

Members present were: Samuel Riddle, sponsor; C. S. Evanson, chairman; F. L. Butler, H. K. Bennett, S. W. Baldwin, A. J. Fink, R. W. Emerson, J. A. Greig, A. G. Jack, J. A. Miller, E. J. Paige, E. S. Rider and J. A. Stoll.

Way and Structures

MEMBERS of the general committee on way and structures and members of various special way and structures committees met at association headquarters, New York City, Dec. 9 and 10, and outlined a program of work for the coming year. Those present included C. A. Alden, E. B. Entwisle, W. G. Hulburt, H. F. Merker, E. M. T. Ryder, A. T. Spencer, C. A. Smith, H. M. Steward, W. W. Wysor and H. H. George, chairman of the general committee. Special committee members present were W. R. Dunham, Jr., C. F. Gailor and E. P. Roundey.

After outlining briefly the work done last year in connection with review of the Manual, Mr. Dunham recommended that the A.E.R.A. specifications for countersunk rivets in the bottom of plates under frogs be changed to conform to those of the A.R.E.A. This was approved.

The desirability of including in all cases drawings of other associations referred to in A.E.R.A. specifications was considered. It was thought that in the case of specifications in general use by the American Electric Railway Association the specifications and drawings should be printed in full in the Manual, but that consideration should be given to special cases where the cost would be large and the use infrequent. If complete details are omitted in such cases reference should be made in the Manual to the publications of other associations where the data can be found.

Splitting the Manual in two or more sections at the time of the next reprinting was discussed. While there was some difference in opinion as to the number of subdivisions which should be made, the committee was unanimous that it should be divided. The committee recommended, therefore, that the next Manual be divided into two or more volumes on departmental lines.

The special committee on switch tongues and hard centers recommended tolerances in the depth of flangeway $\frac{1}{16}$ in. under and $\frac{1}{32}$ in. over when flange bearing and $\frac{1}{16}$ in. under and $\frac{3}{16}$ in. over when non-flange bearing. This was approved. Mr. Ryder reported that the special committee had voted to change the specifications concerning depth of groove from "$\frac{1}{16}$ in. less than the depth of the wheel flange" to read "$\frac{1}{8}$ in. less than the depth of the wheel flange except that the minimum depth of the flangeway shall be $\frac{9}{16}$ in." This committee also recommended the inclusion of a clause to the effect that "when so specified continuous flange bearing shall be provided through crossings and in involved special trackwork except on the inner rail of curves." These recommendations were approved. Blueprints of the standard switch tongue design on which this committee has been working were submitted for inspection.

It was decided to recommend to the executive committee that the special committees on switch tongues and hard centers and on special trackwork be combined. Mr. Roundey reported that the special committee on special trackwork had voted to recommend for approval and adoption as standard by the A.E.R.A. the A.R.E.A. drawings for 7-in. and 9-in. solid manganese crossings, steam railroad over electric railway. Discussion of these plans brought out the fact that the only criticism was due to the feeling that there should be clearance on the web between manganese steel and rolled rail so as to insure a tight fishing fit. It was decided to refer the plans back to the A.R.E.A. with the request that it agree to make this revision.

Work for the special committees on rails and on track ballast and drainage was discussed briefly. Mr. Gailor reported that the special committee on arc welding had the necessary data in shape to prepare the preliminary draft of specifications for welding wire.

In connection with the work of the special committee on pavement, it is suggested that investigation be made to discover why different railways used certain types of pavement, the results being obtained, etc.

For the special committee on rail corrugation, Mr. Wysor reported that particular attention will be given this year to vibration tests. Some chemical tests have been arranged for and measurements of corrugation in the field will continue.

Mr. Spencer presented a brief progress report of the committee studying alloy steels other than manganese for special trackwork. An attempt will be made to secure additional data on this subject. Brief reports were submitted by the special committees on motor bus garage design, carhouse and shop construction and wiring and joint railway and bus terminals. Personnel for the special committees on light section rail and on track gage has not yet been completed and these committees had nothing to report.

Stores Accounting

WORK of the committee on stores accounting was outlined at a meeting held in New York Jan. 10. It was decided to concentrate on two subjects, namely, the accounting and handling of gasoline, oil and grease used in bus operation and the accounting and handling of special materials used for construction. Members present were R. A. Weston, chairman; W. S. Stackpole and A. E. Wilkin.

The News of the Industry

Mr. Insull Urges Need for Community Interests

In an address delivered before the annual meeting of the St. Louis Convention and Publicity Bureau on Jan. 12 Samuel Insull, Chicago, made a plea for greater participation by the leaders of industry and business in the solution of the difficult transportation problem as well as in such community matters as recreation and education. Controversies sometimes arise, he said, because such matters are left exclusively in the hands of those people who have a direct and selfish interest at stake.

In speaking on the subject of civic leadership development and responsibility, Mr. Insull cited the need for greater participation by responsible business men in the development and execution of forward-looking civic projects. Under the existing political methods he considered it the exception rather than the rule for a public official to make party or personal interest secondary to that of the general welfare. Frequent changes in administration prevent the execution of a co-ordinated program of major civic improvements. He considered that this was an inherent characteristic of the existing political structure.

Mr. Insull made it clear that he had no criticism to offer of our form of local or state government and considered it the best so far developed. His suggestion, however, was that the business men of a community represent the only element which is in position to take an active part in the formulation of consistent community policies and plans.

The experience of Chicago in the struggle to develop a transportation program was cited as illustrating the need on the part of leaders of business for participation and co-operation. As a result of the transportation controversy there he pointed out that the money invested for the improvement and expansion of this extremely important community service during the last ten years has lagged far behind that made by other utilities.

More Moves in Buffalo Cases

Justice Clinton T. Horton, in Supreme Court at Buffalo, has issued a temporary injunction restraining the city of Buffalo from revoking a number of franchises held by the International Railway. The injunction was issued upon application of counsel for the railway. Most of the lines of the International Railway affected by the threat of the city to revoke franchises on 18 miles of track are operating under terms of consent granted to the old Buffalo Crosstown Railway, merged with the International Railway. The city contends that the company has failed to comply with the terms of the franchise which it assumed at the time it acquired the franchises and obligations of the Crosstown Railway.

Federal Judge John R. Hazel in Buffalo granted the application of the city of Buffalo for postponement until Jan. 20 of the hearing of the railway's equity suit in the United States Court for the Western District of New York to charge a 10-cent fare in Buffalo and increase its rates on all parts of its interurban lines.

No More Service in Newark, Ohio

Hasty Action by Council in Granting Competitive Rights Makes It Appear Unlikely that City, Now Regretful of Its Action, Will Ever See Co-ordinated Service Resumed

THERE appears to be very little prospect that co-ordinated railway and bus service will be restored at Newark, Ohio, by the Southern Ohio Public Service Company or that trolley operation there will ever be resumed by the company. Not since Aug. 10 last, when such service was withdrawn, have conditions changed so as to make the resumption appear desirable from the point of view of the company, although a large and important element of the community wishes that conditions were different from what they really are at present. These conditions are far from satisfactory. That is generally admitted, but there appears to be no present avenue of escape from them.

It did appear at first as though there was a possibility of re-establishing the railway service, as the citizens and the press desired the company to do so. Unfortunately, the City Council had awarded bus operators the right to run competitive services on the same streets the railway was using. The Chamber of Commerce and influential people agreed to do everything possible to induce the railway to re-establish service, but the City Council, having acted on the competitive franchise, was unable to rescind that grant. It would simply have been futile for the utility to re-establish operations either at the same or a higher fare as it would have had to meet parallel operation competitive with its service. Newark could hardly support one transportation service, much less two. The company therefore finally explained this matter to the people and definitely withdrew from the local transportation field. The assistance proffered by those willing and anxious to make almost any concession to have the company continue service had come too late to be of any real assistance.

Every one of these situations has its background. For years railway operation in Newark has failed to pay expenses. Despite this, service has been maintained through two receiverships and after great effort and absorption of heavy losses a new franchise was granted by the city of Newark effective on Nov. 22, 1924. This ordinance relieved the company of certain paving, extended the franchise life for 25 years and allowed the company to charge a fare necessary to pay for the service. It fixed the fare for the first year. The franchise also carried a clause allowing the company to withdraw any portion or all of its rail or bus service if any competitive lines should be granted a permit to operate.

The granting of this franchise was one of the elements which enabled the company to reorganize and emerge from the second receivership. This it did as the Southern Ohio Public Service Company, which operates the light, power and railway in Zanesville, the railway in Newark, and the interurban line connecting Zanesville, Newark and Columbus.

As a part of the reorganization plans the company acquired control of all bus operations in Newark and has been giving the city of Newark a co-ordinated service of rail and bus even at a substantial loss after operating expenses for the combined operation. In accordance with the terms of the franchise, the company asked the Council for an increase in fare to 10 cents cash and four tickets for 25 cents. The Council took no action. After a period of three months the company further, in accordance with its franchise, announced that the new fare would become effective as of March 5, 1926, whereupon an injunction against the increase in fare was obtained, and before final disposition of the injunction proceedings the court declared a vacation..

Not satisfied with this, the Council, contrary to the spirit of the past two years negotiations, granted a competing franchise for an independent to give service paralleling all the company's rail and bus lines at a 10-cent cash fare and tickets at a reduced rate. Sixty days after this fare permit eight buses appeared on the street.

In view of the lack of faith shown by the Newark City Council and the extensive losses sustained by the company during the past several years the company decided to close down its entire local bus and rail service. On Aug. 9 officers of the company met with the men and advised them of its intention. The company, however, allowed its men, thus thrown out of work, ten days wages. On Tuesday night the company ran a full-page advertisement in the local papers outlining the series of events that led to its action and announcing the fact that the service would be discontinued as of that day.

The company's rate was maintained through the injunction proceedings at a 6-cent cash fare with nine tickets for 50 cents.

The franchise granted by Newark is similar to that passed by the city of Zanesville at a prior date. The greater faith of Zanesville has resulted in a high-grade co-ordinated bus and rail service in that city at the same fare asked in Newark. Zanesville is pleased with the service and the relations between the public, the Council and the company are excellent.

The entire situation in Newark was reviewed at length in an article in the ELECTRIC RAILWAY JOURNAL for Aug. 14, 1926, page 268.

Multiplicity of Moves in Chicago

Day-to-Day Agreement Likely—Two New Ordinances Before Council, One of Which Contemplates Unified System with Gross Investment of $1,003,626,000 by 1950—Hearing on Jan. 17 on Latest Project

WITH two freshly received ordinances before it for final consideration—one from the present surface and elevated lines companies, the other embodying the revised Lisman plan for a 20-year grant—the local transportation committee of the Chicago City Council, entering the most critical period of its traction negotiations, received on Jan. 11 a third and still more pretentious plan for the solution of Chicago's local transportation problems. Whether the plan will permanently supersede the companies' unified ordinance now pending or be considered as an independent proposal was not made known.

The new plan was outlined in a letter received by Chairman Joseph B. McDonough and temporarily, at least, pre-empted the others in the Aldermen's attention. It was prepared by Henry A. Blair, chairman of the Chicago Surface Lines and co-receiver of the Chicago Railways, and contemplates the improvement and expansion of surface, elevated and bus lines, with a present value of $273,000,000, into one great unified system representing an aggregate investment of more than $1,000,000,000 by 1950, with extensive subway construction and elevated trackage extensions.

Within the intervening 23-year period Mr. Blair proposes amortization of $134,237,000 of the capital account, with municipal ownership at the end of the period at a cost to the city of $869,000,000. The purchase of this vast system could be brought about, the letter stated, by turning over to the unified company $429,037,000, which will include the old capital account figure of $237,000,000. The figures disclose that in this 23-year period the company would add $156,037,000 to the capital account, while the city would provide $440,352,000 for subway construction by special assessment or other methods. The company would provide funds for all equipment and other properties incidental to operation.

Mr. Blair defended the extraordinarily heavy investment by saying that the investment for rapid transit in 1950 will be only $145 per capita, the same as required by Detroit for its initial rapid transit system. The $145 in Chicago by 1950 is compared with $260 in New York by 1931, he asserted. The rate of return on this investment is placed at 7½ per cent and the amortization at from 1 to 2 per cent, starting in 1933 at the lower figure.

As revealed to the Aldermen, the Blair plan, which was prepared independently of the new terminable unified ordinance of the surface and elevated lines, envisions a complete revolution of transit methods for millions of riders yearly. During 1926 the Surface Lines carried about 870,000,000 revenue riders, or 75 per cent of the traffic; the elevated lines some 224,500,000, or 20 per cent, and the Chicago Motor Coach Company about 60,000,000, or 5 per cent.

Under the latest plan, the surface lines and bus routes will be considered "slow transportation," while the elevated and subway lines will constitute rapid transit facilities. By 1935, it is predicted, 955,000,000 riders will use the surface cars and buses for all or most of their ride and 390,000,000 will use the rapid transit lines. In 1940 the "slow" lines will carry 1,073,000,000 passengers and the "fast" lines about 475,000,000. And by 1950, when the city has a population of 5,000,000, Mr. Blair estimated that the "slow" riders will number 1,200,000,000 and the rapid transit riders some 800,000,000.

Operation of the proposed consolidated system would be on a service-at-cost basis, discontinuing the present policy of paying 55 per cent of the net traction earnings to the city, but with no fare increase, it was pointed out. The ultimate, but not immediate, aim of the plan is to adopt free transfers among the various units in the consolidated system. All of these things and much more in the way of greater convenience and speed, Mr. Blair believes, can be accomplished on an average fare of 7.35 cents, with a maximum fare of 7.71 cents six years hence and a minimum of 7.06 cents at the end of 1950.

In Mr. Blair's opinion, the adoption of this plan will give Chicago the most comprehensive local transportation system in the world.

The first period of construction under this plan would be between 1928 and 1935. In that period it is proposed to build 13.7 miles of subway and 305 miles of elevated structure. Some time before 1931 40 miles of surface lines and 60 miles of bus line extensions would be made and 1,000 new elevated cars and 600 surface cars purchased. During this time three sides of the present elevated loop would be torn down and replaced with subways and all surface lines tracks removed from the streets of the Loop district. A mezzanine floor level would also be built immediately over the tubes for pedestrians. For these improvements the company would advance $113,902,000 and the city $172,920,000.

During the second period of construction—from 1926 to 1940—for which the company would put up $62,520,000 and the city $110,034,000, Mr. Blair proposes to build approximately 10 miles of subways, 21.5 miles of elevated lines and such surface and bus line extensions as will be considered necessary to keep abreast of the city's growth. Between 1940 and 1950, the third period of expansion, 64.5 miles of elevated and subway line are to be added. The company would bear $113,852,000 and the city $157,398,000 of this cost.

Like the other unified surface and elevated line plan which was presented to the committee the same day, in the form of an ordinance drawn by city and company attorneys, the Blair plan cannot be made effective without enabling legislation.

Mr. Blair explained to the Councilmen that "these proposals are submitted by only one of the interested parties," but said that other interests "have agreed to co-operate in efforts to secure unification of the properties and undoubtedly this plan provides a basis for negotiations."

Following the reading of the Blair proposal, the Aldermen returned to the consideration of the ordinance worked out by city and elevated and surface lines attorneys and of the ordinance submitted for a second time by the F. J. Lisman interests of New York. The companies' ordinance, which after nearly three months of preparation was made public this week for the first time, provides for the consolidation of surface, elevated and bus lines into a single new corporation with unified service. It contemplates large extensions of the "L" lines, the building of subways, the operation of feeder bus lines and the expansion of the surface lines system.

Day-to-Day Agreement Likely in Chicago

THE crisis which appears to impend with the expiration of the Chicago Surface Lines' franchises on Feb. 1 may be temporarily averted by a day-to-day franchise extension approved on Jan. 14 by the local transportation committee and the companies. This measure now awaits only the approval of the City Council and the federal court. It includes all the requirements of the existing ordinances, is not to exceed six months and is terminable by either party on thirty days' notice. Meanwhile Mr. Blair's $1,000,000,000 project is scheduled for hearing on Jan. 17.

It is claimed for the proposal made by the companies that it also is a service-at-cost program and no limit is named for the amount of investment needed. The franchise would be held during the good behavior of the proposed consolidated system and regulation of the company would be vested in a local commission. It is, however, subject to enabling legislation which will give the city power to issue a terminable permit.

The so-called Lisman plan, as presented to the Council on the same day, is a rewritten draft of the proposal made to the city several months ago. It proposes to operate the surface cars on a 20-year franchise under present legal limitations, maintain a 7-cent fare, supply $100,000,000 of new capital in 20 years and $50,000,000 for an additional ten years, amortize the entire investment in 30 years and turn the lines over to the city clear of indebtedness. It also provides for compulsory unification of the various properties and for the construction of subways out of the city's traction fund and leasing to the operating company.

The Lisman proposition was subsequently taken up, but detailed consideration of its various parts was deferred.

A fourth plan for settlement of the local traction problem—the proposal of the Chicago Motor Coach Company to substitute buses for street cars in city-wide service—has not yet reached the stage for the drafting of an ordinance. The matter has been in the hands of a sub-committee but the company has asked for more time to submit a detailed franchise plan.

Terms of Detroit Bargain Found Burdensome

The financial agreement entered into by the city of Detroit, Mich., with the Detroit United Railway in 1922 when the city took over the local lines of the railway is imposing a burden upon the system so onerous that some other method must be found to permit the Department of Street Railways to give proper service. Announcement to this effect was made Jan. 6, when John J. Barlum, member of the Street Railway Commission, suggested that a new financial policy be adopted.

Commissioner Barlum, Del A. Smith, acting general manager of the D.S.R., and William M. Hauser, auditor, are of the opinion that refinancing should be brought about in the form of the issuance of 25 or 30-year bonds to replace the mortgage bonds in favor of the Detroit United Railway, which become due in 1931. These mortgage bonds are payable semi-annually in sums of $500,000, with a final payment of several millions due in four years.

Commissioner Barlum suggested that either new bonds be issued, or the fare increased 1 cent. This latter course would probably increase the revenues of the system $3,000,000 annually. He is reported to have said:

> We are suffering from lack of working capital, and there are only two methods by which we can increase working funds. The first would be an increase in fare and the second plan would refinance the bonded debt of $14,000,000. This latter course would save the system $210,000 in interest and also release money paid into the sinking fund to be used as working capital.

Mayor Smith is opposed to any project that would involve an increase in fare.

Under the agreement of 1922, the city paid $2,777,000 to the D.U.R. on the purchase contract for the city lines, which involved $19,800,000. The remainder was to be paid in semi-annual installments of $500,000. The balance is due in 1931.

Rapid Transit Enabling Act for St. Louis

The rapid transit committee of the Board of Aldermen of St. Louis, Mo., has approved the draft of an enabling act to permit the city of St. Louis, Mo., to build a rapid transit system, including subways and elevated tracks, by bond issues and to assess benefits against property served by the new facilities. The measure must be submitted to the Missouri General Assembly for passage.

One-Man Car Accident at Superior

Six persons were reported killed and seventeen injured, three of them probably fatally, when a one-man car running on the Billings Park line of the Duluth-Superior Street Railway downtown bound became stalled on the Great Northern Railroad crossing at 21st Street, Superior, Wis., and was struck by the oncoming "Gopher Limited." Reports of eyewitnesses disclose that the car had stopped as usual at the crossing and then started over the railroad tracks. The record of subsequent events appears to be obscured, but the car was trapped on the railroad tracks when the crossing gates knocked the trolley pole on the car off the wire, cutting off the current. This made it impossible for the car to clear the crossing in time to avoid the crash. The towerman, in charge of the gates at this crossing, testified that he tried to stop the car by putting down the gates, but that the motorman continued ahead until the center of the car was directly in the path of the oncoming train.

The Car's the Thing in Richmond

The Virginia Electric & Power Company is operating on the various lines of its Richmond division two white cars as a part of its present program for merchandising electric railway and bus service. The cars are being run on the different routes for three or four days at a time. Appropriate slogans, in bold but attractive black lettering, are painted on the sides of the cars and in the space on either side on the interior usually given over to advertising. Some of the slogans painted on the outsides of the cars are: "When you ride a street car or bus, you save the difference," "No parking worry," "More economical," "Safest mode of travel," "We appreciate your service," "Come on, folks, ride with us and 'Save the Difference,' Hop on." On the inside, just over the heads of the passengers, the entire length of the cars, reads:

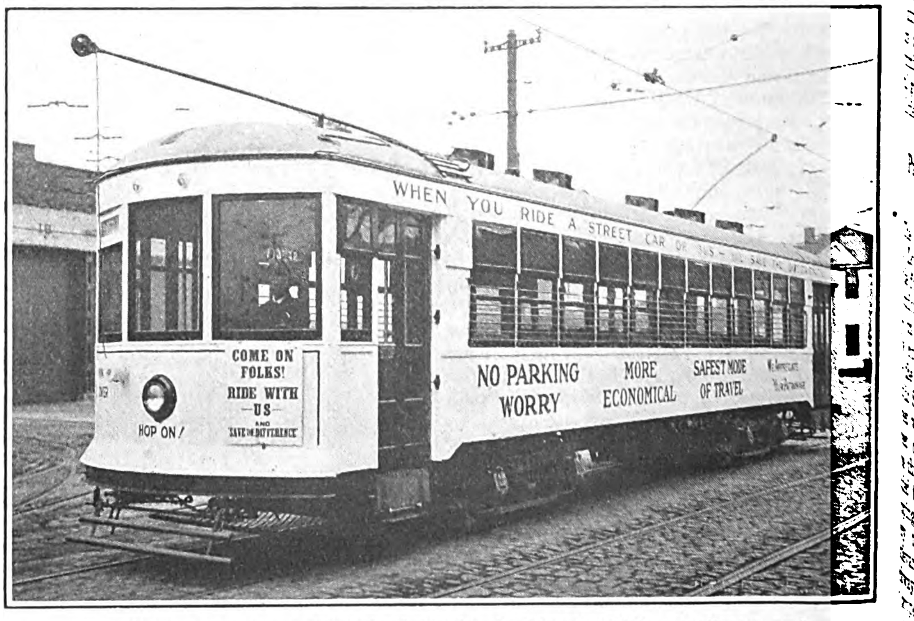
> The present-day electric railway system was first operated successfully in Richmond. Today it saves money for two-thirds of the population of Richmond every day. Forty million people in this country depend on street car and bus service daily. Holidays and workdays, rain or shine, hot or cold, your transportation service is always on the job.

The advent of the white cars was heralded by the placing of cards on other street cars bearing the caption: "Look out for the white cars." This was followed by another, reading, "Have you seen the white cars?"

Other cards being displayed in and on the general run of cars read as follows:

> Your neighbors have no parking troubles. They ride in street cars and buses and save the difference not only today, but every day. Why don't you?
>
> Get acquainted with the man who lives next door and the one who lives on the next block. They're both on this street car.
>
> Shop by street car or bus. All important stores are conveniently located along our lines. No parking worry and you save the difference.
>
> The cops don't tag your street car or bus while you shop. That's why street car and bus shoppers can keep their minds on their shopping.

The program for merchandising electric railway and bus service is being handled by A. H. Herrmann, of the public relations department.


WHEN YOU RIDE A STREET CAR OR BUS
COME ON FOLKS! RIDE WITH US AND SAVE THE DIFFERENCE
HOP ON!
NO PARKING WORRY
MORE ECONOMICAL
SAFEST MODE OF TRAVEL

The White Car Is an Important Factor in Merchandising Railway and Bus Service in Richmond

Illinois Employees Seek Increased Wage

Trainmen of the Illinois Traction System, operating from St. Louis, Springfield, Peoria, Decatur, Champaign and Danville, Ill., whose wage agreements expired on Dec. 1, recently asked a 10-cent increase over the present scale of 55 to 70 cents an hour, and having failed to reach an agreement will submit their claim to arbitration. The personnel of the arbitration board has not been decided and pending settlement of the questions involved the system is operating at the old scale, with the new contracts to be retroactive to Dec. 1, 1926. The traction company is said to have advanced a proposal for reduction in wages. Brakemen receive 55 cents, passenger motormen and conductors 67½ cents and freight conductors and motormen 70 cents.

Would Increase Powers of Maryland Commission

An effort will be made to have the Maryland General Assembly, now in session at Annapolis, enact a law which would give the Public Service Commission of the state the authority to suspend proposed rates until the commission can determine whether these rates are reasonable. Under the present law a public utility can change its rates by giving a 30-day notice to the commission. This gives only a short time for the commission to investigate before the change goes into effect.

Several other bills, all backed by the state administration, and dealing with the Maryland Public Service Commission law, have been introduced. They include a measure to require the consent of the commission to abandon franchises acquired and exercised before as well as after passage of the Public Service Commission law; a measure to require the commission's consent for extensions by utilities under franchises which have been exercised before the passage of the law: a measure to empower the commission to fix minimum as well as maximum rates; a measure to authorize joint investigations, hearings and orders in conjunction with commissions of other states or the federal government in cases of interstate utilities.

Parkway Plan in St. Louis Abandoned

The plan for widening Olive Street, St. Louis, Mo., with a parkway set aside for the use of street cars has been abandoned by the aldermanic committee on streets, sewers and wharves. The committee voted unanimously to file the bill presented by the Board of Public Service providing for paving the street with a 23-foot neutral strip for street cars. Had the parkway plan gone through the United Railways intended to put into effect a system of stopping the Olive Street cars only every three blocks between Grand Boulevard and Twelfth Boulevard. The parkway plan had been bitterly fought by property owners along the street. The various steps in promulgating this plan have been referred to from time to time in these pages. President E. R. Kinsey of the Board of Public Service has had new bills prepared providing for the paving of the street from curb to curb.

Virginia Employees Receive Higher Wage

Made possible by the granting by the State Corporation Commission of increased fares for the Norfolk and Petersburg divisions of the Virginia Electric & Power Company, a straight increase in the wages of all trainmen, including motormen, bus drivers and platform men, amounting to 6⅔ per cent of the present wage scale, was announced recently by Vice-President William E. Wood. The recent adjustment of transportation affairs in Richmond and Portsmouth also played a part in the determination of the company to play Santa Claus to its more than 1,000 employees in the four cities. The increase was effective on Jan. 1, the date set for the starting of the new fare schedules, and will total more than $100,000 annually. The employees receiving the higher wage will get approximately $100 more a year in 1927 than in 1926. Employees in the divisions affected are about evenly divided in number between Richmond and Petersburg as a unit and Norfolk and Portsmouth as an entity, it was said. The Richmond-Petersburg interurban and the terminal men also will receive the wage increase.

The latest wage increase is the second since the Virginia Electric & Power Company was taken over by Stone & Webster, Inc., in July, 1925. The last raise was made when the company obtained the right to charge a 7-cent fare in Richmond and became effective on the date of that increase. Sept. 1, 1925.

The new increase, Mr. Wood said, will consume a considerable amount of the additional revenue to accrue as a result of the Norfolk and Petersburg fare increases just granted.

Pittsburgh Paper Praises Men's Effort

THE wage increase that has been awarded the conductors and motormen of the Pittsburgh Railways constitutes recognition of the co-operation of the "platform men" with the management that has been a factor of magnitude in the rehabilitation of the service and the creation of public good will on which the success of the business seems now to be solidly founded. This recognition is thoroughly deserved. It is not too much to say that the courteous attention which conductors and motormen give to the public they serve has done more than anything else to create the popular confidence and trust in the Pittsburgh Railways that is a delightful contrast to the ill-will that prevailed only a few years ago. These men have earned their "raise," will be the common verdict. — *Pittsburgh Gazette Times.*

New York Commission Not Bound by Franchises

Franchise agreements between municipalities and electric railways with limited fare provisions may be disregarded by the Public Service Commission in fixing fares. The Appellate Division, third department, has so decided on an appeal from an order of the commission by the United Traction Company, Albany, N. Y.

The decision was unanimous. In that respect it blocks an appeal to the Court of Appeals unless special exception is given by the Appellate Division and throws the fare controversy involving the company and the cities of Albany, Rensselaer, Troy and others served by the company's system back where it was before proceedings were started for a 10-cent fare last February.

The finding of the court was that the Miller law, passed in 1921, which gave the commission power to disregard local fare franchises, permanently invalidated the agreements. The law was repealed in 1923, but the court held this did not restore the agreements to force.

Counsel for the company declared repeal of the Miller law did not affect the validity of the ruling of the commission in 1922 within the scope of its authority fixing a 7-cent rate.

Clever Holiday Gifts at Levis

In accord with the spirit of Christmas, the Levis Tramways, Levis, Que., made two kinds of gifts to its patrons combining convenience and ride salesmanship.

During the period Dec. 24-Jan. 10 purchasers of the weekly pass were presented with a leather pass case, an unusual feature of which is the sealing in of the owner's name and address to assist recovery of a lost case and its contents. The pass case was delivered free during the holiday season, when there is a tendency for sales to fall off, but even after the holidays the pass case will be available at cost price. Incidentally, it is worth mention that the December, 1926, revenue of the Levis Tramways constituted a record.

The second gift is one that was invented by H. E. Weyman, general manager, to meet a real need. Mr. Weyman found that many a parent was averse to having the children ride to and from school because younger children are especially prone to lose their tickets, or, if they have a purse, to lose the purse too. He therefore originated a ticket wrist purse for presentation to anyone who bought $1 worth of school tickets or $1.80 of adult tickets during the period mentioned. Thereafter, these purses will be available to patrons at cost. Railways interested in this helpful way of selling rides may secure further particulars by writing to Mr. Weyman.

A pleasing feature of these gifts was a paper slip in French, which, translated, read substantially as follows:

JUST A BRIEF WORD

The little things that one gives; the little actions that one does; the little things that provoke a smile or a jest—all of these are just so much to the good in making life worth while.

Ohio Committee Issues Informative Pamphlets

Seventy-five thousand students of Ohio junior and senior high schools and vocational training schools are studying a school booklet recently issued by the Ohio Committee on Public Utility Information. It is a 56-page booklet, entitled "Aladdins of Industry," and was compiled by the Ohio committee for use of students in English, current topics, science and social science classes, and for reference in preparing debates. It deals with the history and methods of operation of the electric railway, electric light and power, gas and telephone industries. At the end of each chapter suggestions are given for classroom work on the text of the chapter and a number of suggestions for classroom work on new topics, designed to help those students who desire to learn more about each industry on which they must depend to carry on successfully in the present day and age.

Among subjects discussed in the chapter on electric railways are the dynamo, the first complete and practical system, the interurban, the motors, controllers, and starting resistance, the propulsion of the electric car, air brakes, third-rail system, cost of cars, safety-first measures, the rush-hour peak, and various problems of the street railway, including increased riding and fare variation. The 69 electric railway companies in Ohio have track and equipment costing more than $300,000,000, according to the booklet, and operate a total of 3,038 miles of track. In 1925 they carried 871,509,382 passengers; paid taxes of $6,098,010, and operating expenses of $55,439,846.

These booklets are being supplied free of charge to school students in Ohio upon request of school authorities. While the first booklets have been off the press only two months requests for them are rapidly nearing the 100,000 mark. These requests have come so far from more than 600 Ohio schools.

Court Decides Against Chicago Company on Paving

Reversing the decision of the Circuit Court, the Illinois Supreme Court has ruled in favor of the city of Chicago against the Chicago Surface Lines in a suit over payment of the cost of relaying tracks to conform with the widening of 22d Street in that city. The decision will mean an immediate saving of $315,000 to the city, according to Corporation Counsel Busch, and an eventual saving of several millions. It would also aid the city in the present transit negotiations. Other improvements that would probably be affected are the relaying of tracks on Indiana Avenue, costing $200,000, and the removal of tracks at the municipal pier, costing $100,000, Mr. Busch predicted.

Work Started on Maine Road

Preliminary work for the construction of an electric railway across the northern part of Maine has been started. The proposed route, which is known as the Quebec extension, is to be built by United States Senator Arthur R. Gould. It will be 111 miles long with terminals at Washburn, Me., and Lake Frontier, Que. The early work now under way in the Washburn section consists of clearing the right-of-way by cutting down trees and underbrush. Camps are being established along the course and crews will be started as needed to cut ties and poles to be used in the actual construction of the line. Transportation facilities have long been needed for business progress in this and other sections of Maine that are rich in timberland. This project was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 1, 1927, page 57.

Would Sell Forty-five-Cent Ticket in Fort Worth

The Northern Texas Traction Company has asked the city of Fort Worth, Tex., for a revision of the railway fares in that city. The wholesale distribution of transportation that is suggested is the sale of a ticket good for a week the bearer of which may ride the street cars for 5 cents as often as he desires. The ticket is to be sold for 45 cents. For persons who ride seldom a cash fare of 10 cents is suggested, while three tokens may be bought for 25 cents.

The company explains that it is earning a net return on its investment of less than 2 per cent and that new money cannot be secured with that meager showing of earnings. But the company points out that it has constantly improved its service and made it more extensive. The company is "selling" its plan to the people of Fort Worth by newspaper advertising and in many other ways.

News Notes

Fare Hearing Postponed. — Hearing upon the petition of the United Traction Company for increased fares in Albany, Troy and Rensselaer, scheduled for Jan. 12 at 10 a.m., was postponed until Jan. 31 at Albany. The hearing will be continued on Feb. 1.

Increases Interurban Parlor Car Service.—The Northern Ohio Power & Light Company, Akron, Ohio, has placed another modern parlor car in the Canton-Akron-Cleveland service. Others will be placed in the interurban service just as soon as they can be built. These cars seat 50 passengers in individual chairs. There is no extra fare. The time from Akron to Cleveland is one hour and 25 minutes.

Christmas Party a Huge Success.—The sixteenth annual Christmas party was held by the Beaver Valley Traction Company, New Brighton, Pa., on Dec. 21 last. Among the happiest of the guests were the boys and girls of the Beaver County Children's Home, who were transported in a large coach of the Beaver Valley Motor Coach Company to the Junction Park pavilion. The ladies of the Home for the Aged were also the happy recipients of a similar courtesy from the company. Plenty of goodies were provided and in addition boys and girls were presented with dolls, games, mechanical toys and marbles. There were many hours of happiness and fun. Officials and committee men of the company worked indefatigably to make the sixteenth annual party a success.

To Advance Safety Cause.—The Public Service Commission on Jan. 6 directed the New York State Railways to cause all car movements over its crossing of the Pittsford-Palmyra highway No. 776, about 1 mile east of Pittsford, to proceed at a speed not in excess of 5 miles an hour. Motormen are ordered to sound car whistles within a distance of 150 ft. of the crossing and to continue the sounding until the train is over the highway. Evidence submitted at a hearing before Commissioner Van Voorhis showed that the highway was heavily traveled and the view on both sides of the crossing of approaching cars was obstructed to such an extent that additional protection was required.

Increased Rates Delayed.—The Public Service Commission has extended the date on which the Nashua Street Railway, Nashua, N. H., was to put into effect its proposed fare increases from Jan. 10 to Feb. 10. The extension was authorized to allow time to take up further matters relative to the proposed changes. The city of Nashua is objecting to the proposal of the railway to issue fourteen-ride tickets for $1, all of which must be used in one week. The City Council wants the tickets issued without any time limit. A vote was taken by the Board of Aldermen, which was unanimously in favor of no restriction of time tickets.

Transfers Made Larger in St. Louis.—The United Railways, St. Louis, Mo., has enlarged the size of its transfers to facilitate their handling by conductors. The new ones measure 5$\frac{3}{8}$ in. x 1$\frac{3}{8}$ in., about the same size as the transfers used prior to last October. At that time transfer regulations were changed to prevent improper use by car riders and new transfers were printed which were much smaller in size. However, it was found that these were entirely too small, so that very often the names of lines were punched out. The transfer regulations have not been changed, and the company will continue to use pink slips in the mornings and white slips between noon and midnight. The new transfers have fifteen-minute intervals so that a conductor can more clearly indicate time for transfer to a new line.

Insurance Policies as Christmas Gifts.—Employees of the Illinois Power & Light Corporation, Chicago, Ill., received insurance policies as 1926 Christmas gifts from the company. Along with a holiday greeting many old policies were renewed and new ones issued. The gift includes all employees eligible in the following company groups: Illinois Power & Light Corporation, Illinois Traction System, Iowa Power & Light group, Missouri Power & Light Company, and the Kansas group of properties. The card announcing the $500 life insurance policy gift extended best wishes for the holiday season and expressed a hope that each person who received a card would be a member of the corporate family when another Christmas came around.

Recent Bus Developments

More Delay on New York Bus Applications

Chairman Delaney of the Board of Transportation of New York City called on the Mayor on Dec. 12 and informed him it would be physically impossible to report to the Board of Estimate on Jan. 13, as directed last Monday, an analysis of the 40 or more amendments and supplementary data to bus franchise applications which had been filed in the last few days.

Mayor Walker then decided that he would have to defer presentation of his formal resolution on the awards until the regular meeting of the Board of Estimate on Jan. 20. Mr. Delaney assured the Mayor that he could complete his analysis by that time.

It was explained that while the Mayor deeply deplored further delay, his determination to lay the matter over was made so that the city might have every opportunity to peruse the latest offers made by bus franchise applicants and to investigate the financial responsibility of each competing bidder.

Until the unexpected reversal of policy following the consultation between the Mayor and Chairman Delaney every indication pointed to the probability of a deadlock on Jan. 13 in the Board of Estimate if the Mayor persisted in his declared intention to force the issue to an open vote.

Ordinance Would Eliminate Jitneys in Miami

Action on the passage of a new bus and jitney ordinance was deferred recently by the City Commission of Miami, Fla., in order to permit all interested groups to offer suggestions for the solution of what is admitted to be an intricate transportation problem. The ordinance, which had its first reading in December, 1926, will virtually eliminate jitneys in the close-in downtown business section, leaving buses as the major passenger vehicles. The bus lines have assured the city that routes now being served with jitneys will be supplanted with buses in the event the jitneys are taken off.

The new ordinance is so worded that only financially responsible and well-equipped lines can qualify to operate and dependable and regular service to the public must be furnished at all times. Also, city officials claim, simplification of the transportation system and elimination of jitneys in the close-in business district will reduce traffic congestion and represent a saving of thousands of dollars annually to the city by dispensing with extra police and traffic supervision.

About a year ago, when transportation facilities were inadequate, the city decided to add buses to relieve the situation and also to serve territories not heretofore reached. An agreement was made with the Miami Beach Railway whereby the latter was to operate buses for the city. The city guaranteed the actual operating cost of the coaches only, but in turn was to receive half the net profits. The railway advanced the funds for the purchase of 50 buses.

State Law Requirements on Motor Vehicles Sustained

In a series of decisions without written opinions, the United States Supreme Court on Jan. 10 dismissed four cases which sought to invalidate state laws requiring registration fees for motor vehicles and imposing gasoline taxes. The effect is to sustain state laws with these requirements. On the authority of prior decisions involving similar questions, the high court dismissed the cases on the ground of lack of jurisdiction. In all four cases the lower courts had held that there was no cause for action; that the registration requirement was a reasonable state matter, and that the gasoline tax was a tax on sales and not on use.

Missouri Bus Lines Would Be Placed Under Commission Control

Senator McCawley has prepared a bill placing control of all bus lines under the Missouri Public Service Commission and granting that body the authority to refuse to license a bus line when in its opinion the territory is now properly served by a steam railroad or electric railway. The measure would apply alike to either strictly city bus lines or those which operate between cities. In effect the bill would consider bus lines as public utilities, and as such their schedules, routes, rates and practices would be subject to the supervision of the state commission. Under the provisions of the measure, when a bus line applies for a certificate for any route the commission must immediately send notice of such application to every steam railroad and electric railway operating in the territory in which the bus company plans to give service, and also to every city and town through which the bus line would pass. The bill would confirm the rights of existing bus lines, but charges the commission with the responsibility of hereafter deciding whether the evidence overcomes the presumption that such lines are necessary.

Buses in Topeka Do Big Service

In all 23 buses are in daily use on five regular runs in Topeka, Kan., with a total daily mileage of nearly 2,600. This figure has been increased somewhat by trippers, which go on during peak-load periods in the morning and in the evening. The average daily mileage for each motor coach on a regular run totals about 180.

This service is being supplied by the Topeka Railway, owned by the Illinois Power & Light Corporation. On Feb. 1, 1925, the bus service was started by the Topeka Railway as a supplement to its railway service. The first run was a trifle under 5 miles for the round trip. At that time the company owned only five buses. Three railway lines have been abandoned in Topeka and bus service substituted. In other districts the coaches act as auxiliaries and feeders to the existing transportation system.

One Small Line Temporarily Abandons.—The Stroudsburg, Water Gap & Portland Railroad, operating between Portland and Stroudsburg, Pa., ceased operations on Jan. 1. The line will resume service again on June 1. Meantime the company will run a bus to accommodate school children from Water Gap. This line is operated by the Stroudsburg Traction Company.

Buses Replace Cars.—The Shawnee-Tecumseh Traction Company substituted bus service in Shawnee, Okla., for railway service on Jan. 9. The company also substituted buses for trolley equipment on its electric interurban line between Shawnee and Tecumseh. The plan is to put in force improved service on its lines as a result of the change. The buses in Shawnee are to have a fifteen-minute schedule instead of half hourly service maintained by the street cars. Between Shawnee and Tecumseh a 40-minute service will replace the hourly schedule on the interurban line. The company will use 21-passenger buses. The railway equipment will be sold.

Abandonment Conditional Upon Bus Operation.—The Public Service Commission granted on Jan. 5 the petition of the New York & Stamford Railway for approval of a declaration of abandonment of all that portion of its route in the village of Port Chester on Westchester Avenue, and all that portion in the village consisting of its routes on South Regent Street and North Regent Street. These portions of the road constitute a loop outside of the main track of the road on which operations are to continue. The village of Port Chester consented, conditional upon removal of rails and poles and the operation of bus routes on substantially the same route.

First Fatal Bus Accident in Kansas City.—In 3,000,000 miles of bus operation by the Kansas City Public Service Company, Kansas City, Mo., the first fatal accident occurred there Christmas Day, when a 39th Street bus struck and killed Mitchell F. Burch, an eleven-year-old boy who dashed into the path of the bus after a new Christmas football. The railway began operating buses in Kansas City in October, 1925.

Buses Substituted.—The New York Public Service Commission approved on Jan. 7 the petition of the Lewiston & Youngstown Frontier Railway for permission to abandon portions of its lines in Youngstown and the town of Porter, Niagara County, N. Y. This line has been under lease to the Niagara Gorge Railroad. No objection was raised at the hearing by the city authorities or others to its abandonment. Buses have been substituted for service in the village. The railway is directed to remove all existing structures from the streets and highways along the abandoned route and restore the streets to a condition as good as adjacent parts thereof.

Financial and Corporate

Financial Readjustment Suggested for Boston "L"

Attention is called by *Barron's* to the fact that common shares of the Boston Elevated Railway, Boston, Mass., recently sold at 87, close to the highest price recorded since 1922, and up ten from the 1926 low of 77. In connection with the recent demand for the stock, that authority says, it is of interest to note that in the portion of the report of the Division of Metropolitan Planning which outlines a suggested readjustment of the Boston Elevated Railway the statement is made that "it is our belief that the stocks of the new corporation will, under normal conditions, sell at par or better . . . "

The proposed new corporation is the Boston Transit Company, and under the division's plan Boston Elevated common stockholders would receive for each present share of 6 per cent stock a share of 5 per cent common stock in the new company, the dividend on which would be guaranteed by the state for 40 or 50 years, or whatever period of public control might be decided upon. It is the conviction of the Planning Division that the long-time state guaranty would not only compensate for the 1 per cent reduction in dividend but would in normal times add fifteen points to the present market value of the stock.

As *Barron's* points out, there is not the slightest certainty that the plan recommended by the Planning Division will be adopted by the Legislature or accepted by the stockholders, but that commentator says it is worth noting that, in the opinion of the division, if a plan is put through substantially as recommended it would result in both the 4½ per cent preferred and 5 per cent common stocks of the new company selling at around par.

The present holders of the outstanding preferred stock of the Boston Elevated Railway would under the plan receive for each share new 4½ per cent preferred on the following basis: Present 8 per cent preferred, not more than 1.3 shares; 7 per cent "third preferred," 1.05 shares. Unlike the common, the preferred stock of the new company would carry a guaranty that at the end of a new period of control the state would purchase the stock of the owners at par if they so desire. An arrangement such as that mentioned would in effect lend to the stock the status of a Massachusetts bond, except in respect to exemption of the income return from federal supertax.

Receiver Named for Kansas Interurban

Judge Reeves of the federal court at Kansas City, Mo., on Jan. 8 appointed John F. Layng of the Buchanan & Layng Corporation, New York, receiver of the Union Traction Company, Coffeyville, Kan. The railway was incorporated under the laws of Kansas on Jan. 14, 1904. It operates 67 miles of line in and between Coffeyville, Independence and Cherryvale and Parsons, Kan. It owns the entire capital stock of the Kansas-Oklahoma Traction Company. The road is on private right of way except in Coffeyville. It also owns and operates the line between Parsons, Kan., and Nowata, Okla. The road and equipment are carried in the balance sheet at $2,456,085. There is outstanding $1,203,762 of funded debt.

Loss on San Francisco Municipal $315,830

For the Year Ended June 30, 1926, This Loss Shows an Increase of $10,668 Over the Year Ended 1925—Excess of Income Over Operating Expenses, Depreciation and Accidents Was $7,131

TOTAL revenue of the Municipal Railway of San Francisco, San Francisco, Cal., for the year ended June 30, 1926, was $3,409,965, against $3,281,498 the year before. Interest on securities owned fell off to $43,467. A consideration of detailed operating expenses shows an increase in every account, leaving the total of $2,705,146, or $160,426 greater than in the year 1925.

The report, prepared for and approved by the finance committee of the Board of Supervisors, explains that for the purpose of securing a comparison between the results of operation of the municipally owned utility and similar utilities operated by private capital the charter of the city and county of San Francisco provided that the operating reports should include certain comparison charges consisting of items which constitute part of the actual cost of operating privately owned companies but which the municipally owned utility is not required to pay. These charges in 1926 amounted to $322,961, leaving a net loss of $315,830 for the year. The deficit in the cumulative account from Dec. 28, 1912, to June 30, 1926, was $1,645,378.

Items in the balance sheet are listed in detail. Capital assets include road and equipment, $8,245,107, and general expenditures, $324,872. Current assets consisted of $860,946 securities bought for the depreciation fund, $26,202 in accounts receivable and $170,149 in materials and supplies. The item of deferred assets was the same figure of $132,123. Thus the total assets was $10,817,735. Current liabilities included accounts and vouchers payable, $267,916, and interest on funded debt, $40,845. The reserves included a depreciation of $1,117,484 and a reserve for compensation of $127,756.

The Municipal Railway has no capital stock and the excess of its assets over its liabilities represents surplus. This surplus has been divided into two classes, a contributed surplus and a surplus from income. The contributed surplus includes an item of $26,000,

COMPARATIVE INCOME ACCOUNT, MUNICIPAL RAILWAY OF SAN FRANCISCO

	Year Ended June 30		Dec. 28, 1912 to
	1925	1926	June 30, 1926
Passenger revenue	$3,268,383	$3,395,950	$32,079,523
Miscellaneous revenue	13,115	14,015	137,485
Total revenue	$3,281,498	$3,409,965	$32,217,009
Interest on securities owned	44,595	43,467	404,736
Total income	$3,326,093	$3,453,432	$32,621,745
Operating expenses:			
Way and structures	$115,073	$134,911	$1,049,905
Equipment	197,619	200,365	1,893,471
Power	464,990	488,812	4,323,507
Conducting transportation	1,600,499	1,694,704	14,295,324
Traffic	....	....	3,836
General and miscellaneous	166,333	186,351	1,317,054
Loss on road retired	....	....	8,184
Total operating expenses	$2,544,515	$2,705,146	$22,891,284
Other deductions:			
Taxes—motor bus	205	....	205
Total operating expenses	$2,544,720	$2,705,146	$22,891,489
Excess of income over operating expenses	$781,372	$748,286	$9,730,256
Less: Interest on funded debt	186,678	177,133	2,738,774
Excess of income over operating expenses and interest	$594,694	$571,153	$6,991,482
Less: Reserves for depreciation and accidents	588,308	564,022	5,726,167
Excess of income over operating expenses, depreciation, accident reserves	$6,385	$7,131	$1,265,315
Less: Charter comparison charges	311,548	322,961	2,910,693
Net loss	*$305,162*	*$315,830*	*$1,645,378*
Analysis of comparison charges:			
State franchise tax	$172,279	$179,036	$1,689,869
Municipal franchise tax	130,735	135,838	1,090,731
Municipal car licenses	3,135	3,135	36,528
Federal income tax	....	....	13,270
Salaries of clerks	....	....	4,872
Law expenses	....	....	13,500
Insurance	5,398	4,951	61,920
	$311,548	$322,961	$2,910,693

Italics indicate loss or deficiency.

COMPARATIVE GENERAL BALANCE SHEET, MUNICIPAL RAILWAY OF SAN FRANCISCO, AS OF JUNE 30, 1926

Assets:	1926	1925	Increase or *Decrease*
Capital assets	$8,570,280	$8,317,283	$252,997
Current assets	2,115,331	2,146,136	*30,805*
Total assets	10,817,735	10,595,543	222,191
Liabilities, reserves and surplus:			
Funded debt	$3,590,100	$3,791,000	$*200,900*
Current liabilities	308,761	383,995	*75,234*
Reserves	1,469,225	1,476,143	*6,918*
Contributed surplus	356,552	332,552	24,000
Surplus from income	5,093,096	4,611,851	481,244
Total surplus	$5,449,649	$4,944,404	$505,244
Total liabilities, reserves and capital	$10,817,735	$10,595,543	$222,191

Italics indicate loss or deficiency.

premium on funded debt and contributions from general taxes, $306,552. In surplus from income is included $1,984,100, an item actually set aside for bond retirement. Of this amount the item of $1,887,000 represents bonds redeemed and canceled and the item of $97,100 cash.

An item of considerable interest is the charter reserve of $1,414,258 for insurance and taxes, which is part of the sums set aside for comparison with private operation explained above. The report states that as the municipal system does not have to pay any of these charges the receipts from operations were deposited in the operating cash fund without any restrictions as to how they were to be used. Most of the cash in the operating fund represented by such comparison charges was actually spent in new construction and addition and betterment work, so that these reserves representing obligatory comparison charges have in reality been used as reserves for betterments. For the purpose of making the balance sheet reflect the actual result of operations the amount expended in addition and betterment work has been reflected in an account entitled "Additions and Betterments from Income," and the charter reserves for insurance and taxes carry a balance equal only to the unused portion of the original reserves. The amount included in the additions and betterments is $2,874,570.

The net loss on bus operation for the year was $33,046, against $16,987 in 1925.

STATEMENT OF BUS LINE OPERATIONS, MUNICIPAL RAILWAY OF SAN FRANCISCO YEAR ENDED JUNE 30, 1926

Revenues:			
Passenger earnings	$53,467		
Quartermaster's tickets		$5	
School tickets		1,067	
Local transfers		18,358	
Total revenue credits			$19,431
Total passenger revenue and credits			$72,898
Operating expenses:			
Repairs to buses		$13,282	
Tire expense		9,627	
Gas and oil		13,477	
Cleaning, washing and greasing		10,179	
Conductor-chauffeurs' wages		36,323	
Depreciation		6,748	
General and miscellaneous		16,307	
Total operating expenses			105,945
Net loss for year			$33,046

STATISTICAL DATA, MUNICIPAL RAILWAY OF SAN FRANCISCO FISCAL YEAR ENDED JUNE 30, 1926

	Total Amount	Per Car-Mile	Per Car-Hour
Total passenger revenue	$3,395,950.24	$0.3651	$3.5321
Total operating expenses (taxes and depreciation not included)	2,705,146.10	0.2908	2.8136
Total operating earnings (taxes and depreciation not included)	690,804.14	0.0743	0.7185
Ratio of earnings to passenger revenue	0.2034		
Total taxes and charter charges	322,961.61	0.0347	0.3359
Ratio to passenger revenue	0.0951		
§Depreciation	564,022.09	0.0606	0.5866
Ratio to passenger revenue	0.1661		
Operating expenses, depreciation and taxes	3,592,129.80	0.3861	3.7361
Ratio to passenger revenue	1.0578		
Net deficit from operation	*196,176.56*	*0.0210*	*0.2040*
Ratio to passenger revenue	*0.0578*		
†Passenger car mileage	9,302,073		
‡Passenger car-hours	961,451		
Platform expense (67½ cents per hour July 1, 1925, to April 15, 1926. 72½ cents per hour April 16, 1926, to June 30, 1926.) Bus operators 5 cents per hour additional. Time and one-half for overtime after eight hours; and after ten hours range; time and one-half for seventh day work. Twelve days vacation per year with pay	1,413,684.62	0.1520	1.4704
Number of passenger cars owned	209		
Number of work cars owned	6		
Total number of cars owned	215		
Total number of buses owned	13		
Total number of cars and buses owned	228		
Passengers carried—5-cent fares	67,285,956		
5-cent fares—government tickets	35,385		
2½-cent fares—school tickets	1,156,110		
2-cent fares—revenue transfers	301,441		
Free transfers	14,062,150		
Free passengers—employees	549,866		
Total passengers carried	83,390,908		
Number of passengers carried per car-mile		8.96	

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§The sum of $201,000 expended from depreciation fund for bond retirement.
†Includes car mileage of buses.
‡Includes car-hours of buses.
Transfers lifted at Fillmore and Union Streets treated as revenue transfers pending result of present litigation with the Market Street Railway.
Italics indicate loss or deficiency.

Operating surplus of the Municipal Railway of San Francisco is made up as:

Operating surplus		*$1,311,956*
The following is an analysis of the above:		
Surplus, June 30, 1926		*$1,052,316*
Credits: Transfers from depreciation fund to operating fund to cover deficits in the latter	$95,420	
Insurance refunds credited to compensation reserve but deposited in operating fund	337	
Adjustment of reserve for bond redemption	3,900	99,657
		$952,658
Debits: Interest on securities credited to income but deposited in depreciation fund	$43,467	
Amount transferred from income account	315,830	359,297
Total		*$1,311,956*
Total surplus from income		$5,093,096
The total suplus derived from the operations of the road is as follows:		
Bonds retired through income		1,887,000
Reserve for bond redemption		97,100
Advance general fund—Twin Peaks Tunnel		82,152
Advance general fund—Stockton Street Tunnel		18,971
Advance general fund—Ocean Shore Railroad switching		1,000
Charter reserves		1,414,258
Additions and betterments from income		2,874,570
Operating surplus		1,311,956
Total		$5,093,096

Italics indicate loss or deficiency.

The total single track mileage as of June 30, 1926, was 74.12. The total bus route mileage as of that date was 7.40.

Another Step in New Haven Acquisition

The New York, New Haven & Hartford Railroad, New Haven, Conn., which a short time ago received the necessary approval from the municipalities served by the Worcester Consolidated Street Railway, Worcester, Mass., and the Springfield Street Railway, Springfield, Mass., to take over and control both railways, has taken the next step in order to commence rehabilitating both properties.

Before the New Haven can start actual work, the act passed by the 1926 Legislature provides that the New York, New Haven & Hartford Railroad shall acquire all the common stock of the New England Investment & Security Company, present owner, which also controls the voting stocks of the two electric railways. The New Haven has entered into an agreement with all holders of this stock, through which the railroad will deliver $290,000 par value, of the fifteen-year notes of the Investment company, for all the common stock. The New Haven owns $13,115,000 of these fifteen-year notes. The exchange is expected to take place shortly, and the New Haven will have full control of both railways with the power to operate these utilities subject to the approval of 75 per cent of the municipalities served.

Refunding of Illinois Power Debentures Proposed

In view of the present favorable condition of the money market and the excellent investment standing of its securities the Illinois Power & Light Corporation, Chicago, is in a position to refund its 7 per cent debentures, now outstanding in the principal amount of $9,614,800, by a new issue of debentures bearing a substantially lower rate of interest, probably 5½ per cent, at a very considerable saving to the company.

In conformity with the charter and by-laws of the company, it is the intention to retire the debentures, by purchase or redemption, on or before April 1, 1927, and to create, issue and sell new debentures or debenture bonds in a principal amount not to exceed $9,500,000, bearing interest at a rate of not to exceed 6 per cent, and with such maturity or maturities, and redeemable at such price or prices, as may be determined by the directors. The new debentures will probably be dated as of March 1, 1927, and issued about that time. The principal amount of the new debentures will not exceed the amount of the debentures at present outstanding.

Receiver Named for Missouri Property

Frank C. Schwenk, Allenton, Mo., was appointed receiver on Dec. 30, 1926, by Circuit Judge McElhinney at Clayton, Mo., for the Grand View Railroad. This property formerly operated an electric line along Lemay Ferry road in the southern part of the county.

The line extended from Broadway and Mary Avenue, Luxemburg, to Continental, Mo. It was formerly known as the St. Louis, Montesano & Southern Railroad. Even in the pre-bus days the line was not a money maker, but was able to keep going because a large cement company had contributed to its upkeep so as to provide service for its employees.

Operation ceased a year ago with the permission of the Missouri Public Service Commission. The application for the receivership was made by the St. Louis Union Trust Company, trustee for a $100,000 bond issue of the railroad. Mr. Schwenk will sell the property.

Notes Issued in Minneapolis.—The Yellow Cab Corporation, Minneapolis, Minn., the stock of which is now controlled through recent purchase by the Twin City Rapid Transit Company and is being operated in connection with that company's electric and bus lines subsidiaries, has made a new issue of $250,000 of 6 per cent serial gold notes to be dated Jan. 1, 1927, and to mature $50,000 a year beginning Jan. 1, 1928. The first two maturities are priced respectively at 100.96 and 100.93 and the remaining three at 100. The issue is being financed through Lane, Piper & Jaffray, Inc., Twin Cities. The corporation operates taxicabs in the Twin Cities, Duluth and Rochester, Minn.

Financing of Purchased Company Approved.—Permission was granted to the Public Service Rapid Transit Railroad by the Public Utilities Commission on Jan. 8 to issue $210,000 of common stock. The proceeds will be used for the acquisition of the property of the North Jersey Rapid Transit Company and other capital purposes. The line is to be included in the Public Service Corporation group.

Personal Items

W. H. Taylor a Vice-President of U.G.I.

William H. Taylor, nationally known in public utility circles as an expert in appraisal and rate matters and in general consulting engineering work and vice-president and general manager of the Georgia Railway & Power Company, Atlanta, Ga., since 1923, has been appointed a vice-president of the United Gas Improvement Company, an additional position having been created. He will assume his new duties on Feb. 1.

Mr. Taylor has been connected with the United Gas Improvement properties for more than 23 years. He has been head of its plants in Gloversville, N. Y.; Charleston, S. C., and Omaha, Neb. He is a graduate of Stevens Institute of Technology and an engineer by profession. He began his active career in 1903 as a constructor with the United Gas Improvement forces. He has risen step by step through the engineering, management and construction departments to the position of vice-president and general manager of outlying properties. When in 1923 he became vice-president and general manager of the Georgia Railway & Power Company he took over supervision of the various departments, assisting H. M. Atkinson, chairman of the board, and P. S. Arkwright, president.

W. H. Taylor

Mr. Taylor's offices will be in the central U.G.I. building in Philadelphia.

Changes in Fond Du Lac

Alvin E. Gerg, who has been connected with the Wisconsin Power & Light Company since 1918, has resigned. Mr. Gerg was in charge of the commercial activities of the company in Fond du Lac, Sheboygan and Oshkosh, Wis.

Frank J. Cottrill, district sales manager of the Wisconsin Power & Light Company at Fond du Lac, prior to which he was commercial manager of the Iowa Railway & Light Company at Cedar Rapids, has been promoted to succeed Mr. Gerg.

Louis R. Schichler, a member of the sales force of the Wisconsin Power & Light Company, has been promoted to succeed Mr. Cottrill.

Harry Reid Heads National Electric Power Group

Victor Emanuel, chairman of the board of the National Electric Power Company, New York, has made the following announcement of changes in the personnel of the officers and directors of the company: Samuel Insull is now chairman of the company and Victor Emanuel has resigned as chairman. Albert Emanuel has resigned as president and has been succeeded by Harry Reid, Indianapolis, Ind., formerly president of the Interstate Public Service Company and the Kentucky Utilities Company. Albert Emanuel, Thomas O'Hara, L. E. Yeager and Charles W. Yant have resigned as members of the board of directors and have been succeeded by Samuel Insull, Martin J. Insull, Harry Reid and C. B. Ziegler. Victor Emanuel, A. C. Allyn, Charles D. Makepeace, W. H. Seibert and R. E. T. Riggs will remain as directors of the company.

Included among the properties in the National Electric Power group is the Cumberland County Power & Light Company, Portland, Me., operating the Portland Railroad. It is understood that the change in personnel contemplates the removal of Mr. Reid to New York, his new headquarters.

Promotions by Byllesby

At a meeting of the board of directors of H. M. Byllesby & Company on Dec. 31, A. S. Cummins, assistant manager of the bond department, and O. G. Corns, sales manager of the Western offices, were made vice-presidents.

Mr. Corns' first position, in 1901, was with George D. Cook & Company, after which he joined Mason, Lewis & Company. He later joined E. H. Rollins & Sons. Leaving E. H. Rollins & Sons, Mr. Corns took charge of the sales department of Allerton, Green & King, and in 1915 became associated with H. M. Byllesby & Company.

Mr. Cummins has been connected with the Byllesby organization since 1909. His early experience was in the operating department of the Northern States Power Company at Minneapolis. In 1907 he became vice-president of the Caribbean & Southern Steamship Line, then a subsidiary of H. M. Byllesby.

At the outbreak of war Mr. Cummins joined the military service. He was a captain in the Air Service. At the close of the war he rejoined H. M. Byllesby & Company, in charge of wholesale and syndication work. He has been in direct charge of the sale of securities under the customer-ownership plan.

Tri-Cities Properties to Merge—Changes in Personnel to Be Made

The management of the Tri-City Railway of Iowa and Illinois will be united under one head effective on Feb. 1, according to an announcement made by R. B. McDonald, president of the local companies of the United Light & Power Company.

R. J. Smith, at present general manager of the Tri-City Railway of Iowa, will become manager of both companies, succeeding T. C. Roderick, who has been appointed vice-president and general manager of the Ottumwa Gas Company. Mr. Smith will also continue his duties as general manager Clinton, Davenport & Muscatine Railway.

Mr. Roderick has been with the railway for approximately seven years. He entered the utility service as assistant to J. G. Huntoon, when the latter was general manager of both the Iowa and Illinois properties.

William J. Wuestenfeld, general manager of the Ottumwa utility, will go to Davenport as assistant general manager of the People's Light Company, filling the vacancy created by the appointment of C. R. Stahl, former assistant general manager, to the position of general manager Panhandle Light & Power Company at Borger, Tex.

A few years ago, when J. G. Huntoon retired, the two companies were placed under separate management. This arrangement has been continued until the present.

George C. Towle Will Leave Scranton

George C. Towle, affiliated with the Scranton Railway, Scranton, Pa., since June, 1926, will sever his connections with that property on Feb. 1. His railway service has covered a period of 37 years, during which he was engaged for the greater part of the time on Stone & Webster properties and later on the American Railways properties.

Early in his career he was appointed master mechanic of the Allentown & Bethlehem Rapid Transit Company, Allentown, Pa. He resigned a year later to become superintendent of the Biddeford & Saco Railroad, Biddeford, Me. Here he remained for three years. At this period in his career he engaged for a brief time in the manufacturing end of the business, but returned to the operation end to take charge of the Houghton County Traction Company at Houghton, Mich. Two years later he was transferred to Ponce, Porto Rico, where for two years he had charge of the construction of the Ponce Railway & Light Company.

Nor were his activities to end there. His next move included the management of the Mattoon and Charleston properties of the Central Illinois Traction Company, Mattoon, Ill., and association with the Syracuse & South Bay Electric Railroad, Syracuse, N. Y. In 1906 he was appointed general manager of the People's Railway, Dayton. He withdrew from the management of the People's Railway early in 1920 to take charge of the rehabilitation of the Logansport Utilities Company. In 1920 he joined the forces of the Dayton Pneumatic Tool Company, where he served until 1926, when he returned to an American Railways property, this time at Scranton as superintendent of transportation.

When they learned of his intention to resign his position at Scranton, the employees of the Scranton Railway, through a committee, expressed their regret that they would no longer be affiliated with him in a business way. Then, as a testimonial of the regard in which he was held, a pocketbook was presented to him containing a substantial sum of money. Mr. Towle has no definite plans for the future.

G. W. James, Jr., with "Journal"

G. W. James, Jr., has joined the staff of the ELECTRIC RAILWAY JOURNAL as assistant editor. He will be located in New York. Mr. James is by profession an engineer, but he was reared in the atmosphere of journalism, his father having been an editor for 50 years and with the exception of the late Colonel Watterson was probably in service longer than any other editor in the South.

Mr. James attended the Virginia Polytechnic Institute, taking civil engineering and later took a course in electrical engineering at the Virginia Mechanics Institute. For seven years thereafter he was in the maintenance of way department of the Virginia Railway & Power Company. He also had much other engineering experience, notably with the Virginian Railway, Turner Construction Company, the Foundation Company and the Chesapeake & Ohio Railroad. During this entire time he was writing special articles for newspapers, contributing book reviews, etc., and more recently was engaged in editorial work for the Western Electric Company and the Chesapeake & Ohio Railroad on their house organs.

In his newspaper work Mr. James was connected with the Richmond *Times-Dispatch*, Richmond *News Leader*, the Norfolk *Virginian Pilot*, the Richmond *Journal* and the Richmond *Evening Journal*. This is only part of the record of the man, but it does indicate the wide experience Mr. James has had as an engineer and a publicist.

Obituary

Alves Dixon

Alves Dixon, general manager of the Baton Rouge Electric Company, Baton Rouge, La., died recently at El Paso, Tex., to which city he had returned to enjoy a vacation with his family, among old friends in familiar scenes. Shortly after his arrival he was taken sick and later he died in a sanatorium where he had been confined a few months.

No one knew El Paso and its immediate surroundings better than Mr. Dixon, who had seen it grow in the 21 years he had known and loved it. To this Empire city located on the border line, with the mountains of New Mexico in the distance, went Alves Dixon in 1904. He became a motorman for the electric company. Quickly did he advance through various positions in the ranks until he assumed the rôle of general superintendent of railways. In that position he accomplished a great deal for the people of that city. He improved schedules, kept equipment up to date and schooled the operators in the lessons of competence, courtesy and carefulness.

In appreciation of his efforts and successes Stone & Webster proposed to promote him to the managership of the Baton Rouge Electric Company, Baton Rouge, La. Then was the opportunity presented to the residents of El Paso to show Mr. Dixon how much they thought of him. A novel parade was staged on June 20, 1925, in which citizens from all walks of life took part to speed the parting executive on his way to Baton Rouge. Many will never forget an interesting feature of the parade—the first mule car ever operated in El Paso. On this car rode Mr. Dixon and a notable group of El Paso citizens. Forty-three years before the car had made regular trips between El Paso and Juarez. There was also a celebration in honor of the accident record of the company, April, 1925, making the best showing of any month during the past fifteen years. This was due to the efforts of Mr. Dixon himself, with whom safety was a hobby.

The late Alves Dixon was active in public life. At one time he was president of the El Paso Country Club, president of the Rotary and the El Paso Social Club. In addition he was secretary of the Texas Sons of the Revolution, member of the Spanish War Veterans and Veterans of Foreign Wars. He was active also in the affairs of the Southwestern Public Service Association.

In his death the Stone & Webster properties have lost a valuable railway man and the utility industry one of its outstanding personalities.

C. E. A. Carr

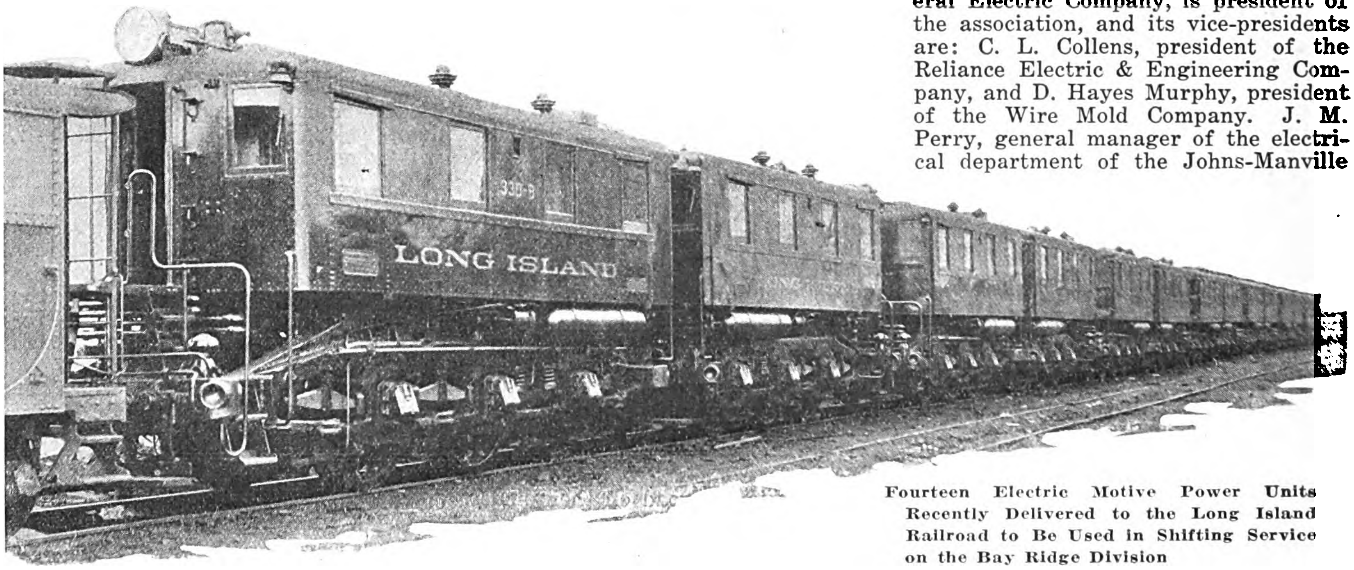
C. E. A. Carr, engaged recently in the railway supply business at Toronto, Ont., died on Dec. 30 in that city as a result of complications following an operation for appendicitis. He was born in Thornton, Ont., 56 years ago, and before going into the business in which he was engaged at the time of his death he had been in utility work in the United States and Canada for many years. Mr. Carr was graduated from the high school at Barrie, Ont., in 1883, and then studied at the British-American Commercial School, Toronto, until 1886. He was in the office of the Toronto city engineer from 1888 to 1891, and from 1892 to 1894 was secretary to the general manager of the Toronto Railway, the Montreal Street Railway and the Cleveland Electric Railway. From 1895 to 1905 he was general manager, secretary and treasurer of the London Street Railway, London, Ont. During his connection with the London company Mr. Carr also was general manager and secretary of the Montreal Park & Island Railway. From 1905 to 1908 he was with J. G. White & Company as manager of the Helena Light & Railway Company. He was also at one time manager of the Quebec Railway, Light & Power Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

St. Petersburg Railways Allotted $400,000 for Improvements

Under the new bond issue approved early this year by the city of St. Petersburg, Fla., $400,000 has been appropriated for improvements for the municipal street railways system. These improvements include track extensions for three blocks on First Avenue, 21 blocks on Ninth Avenue, and special work in various parts of the city. A new carhouse estimated to cost $105,000 equipped with all modern facilities, and storage tracks are included in the approved plan. Work will be completed by July 1. Combined revenue from the city's four public utilities is reported at more than $1,000,000. An allotment of $235,000 has been made for improvements to power plants.



Fourteen Electric Motive Power Units Recently Delivered to the Long Island Railroad to Be Used in Shifting Service on the Bay Ridge Division

Great Northern to Spend $12,000,000 for Equipment

Ralph Budd, president of the Great Northern Railway, announces that $12,000,000 will be spent during 1927 for new equipment, materials and supplies, including rails. Motor-generator types of electric locomotives will be placed in service over the Cascade Mountains during the coming year. In addition, the company is experimenting with a large oil-electric locomotive in its Minneapolis Terminal, with a view of determining whether the extensive use of this type of motive power is practicable.

New Pole Concern Expects 30 Per Cent Cedar Trade

By acquisition of the principal assets of the National Pole Company and the National Pole & Tie Treating Company the National Pole & Treating Company, a newly formed corporation, expects to do 30 per cent of the business in cedar poles for electric railway lines in the United States.

Record Shipment of Electric Locomotives to Long Island

Fourteen electric locomotives, comprising the largest single shipment of its kind ever made, was delivered to the Long Island Railroad recently.

These locomotives have been stored by the company to await the completion of the Bay Ridge Division, where they will be used in shifting service. Each locomotive is rated at 1,000 hp., weighs 75 tons and can be operated at a speed of 25 m.p.h. At a speed of 12.4 m.p.h. the drawbar pull is 44,200 lb. They can be operated individually or for heavy service, two in multiple as a two-cab locomotive. It is claimed that when so operated they constitute the most powerful shifting engines ever built. The mechanical parts were built at the Altoona shops of the Pennsylvania Railroad, from where the record shipment was started. All electrical equipment was supplied by the Westinghouse Electric & Manufacturing Company.

These locomotives represent one more step in the development of the electric service of the Long Island Railroad. They are designed for the purpose of establishing a standard switching locomotive, not only for the Long Island Railroad, but for the Pennsylvania Railroad System in general.

Since 1905, when the first electric lines were placed in operation, the electrified track-miles of the Long Island Railroad have risen from 64 to 300, current consumption from 20,000,000 to nearly 200,000,000 kw.-hr. a year, number of multiple-unit cars from 187 to 904, car-miles from 3,500,000 to 35,000,000 per year, and passengers carried annually from less than 10,000,000 to 100,000,000.

N.E.M.A Selects Quarters in Graybar Building

Headquarters of the National Electrical Manufacturers' Association will be removed to the new Graybar Building upon its completion April 1, it was announced this week.

This move will place the association in the new business center of New York City and within 200 ft. of the Grand Central Terminal. In addition to its work of collecting and disseminating statistics of the electrical industry the association is continuing the work of its committee on uniform cost accounting, which during the year 1927 will keep in close touch with the various departments of the United States government.

Gerard Swope, president of the General Electric Company, is president of the association, and its vice-presidents are: C. L. Collens, president of the Reliance Electric & Engineering Company, and D. Hayes Murphy, president of the Wire Mold Company. J. M. Perry, general manager of the electrical department of the Johns-Manville Manufacturing Company, is treasurer, and the affairs of the asociation are in charge of Alfred E. Waller, managing director.

General Electric Big Prize Winner at Sesqui Exposition

Of the prizes awarded at the recent Sesqui-Centennial International Exposition at Philadelphia, the highest award given, two grand prizes, three medals of honor and nine gold medals, in addition to a number of lesser awards, were won by the General Electric Company.

One of the grand prizes was awarded for "systems of electric transportation and traffic regulation devices." This recognized the company's endeavors in the field of electric locomotives, street car equipment, automobile motors, Novalux traffic signals and aviation beacons. The other grand prize was given for "excellence of products and service given humanity."

One medal of honor was presented for "gas-electric system of drives for buses," one for "G.E. Mazda lamps" and one for "turbine super-charger."

Gold medals were awarded as follows:

For "automatic induction voltage

regulator as typical of apparatus of this class made by exhibitor," for "a.c. and d.c. motors," for "direct-current generator—marine type—as typical of machines of this class made by exhibitor," for "electric fans of high quality," for "an electric mine locomotive fitted with automatic cable reels of high efficiency," for "emergency automatic throwover switches mounted on vertical steel panels," for "motor-generator set typical of machines of this class made by exhibitor" and for "type H transformers."

Later Predictions Substantiate "Journal's" Prophecies for 1927

Outlook Considered Promising by Business Men and Financiers—Rumors of Labor Trouble in Mining and Railroad Circles Are the Only Dark Clouds on the Horizon

DURING the past two weeks reams of statistics and predictions have substantiated the JOURNAL'S retrospect of 1926 and prophecies for 1927, as published in the statistical number Jan. 1. Confidence is the keynote sounded by business men and financiers in the various reviews that have appeared during the fortnight. Solidity for 1927, both for industries in general and the electrical field in particular, is predicted.

First and foremost, Secretary Mellon reports the financial structure of the federal government in excellent condition. The national debt is below $19,500,000,000, compared with a peak of $26,500,000,000 just after the war.

A study of the general business index chart for 1926 reveals that business did not rise more than 10 per cent above computed normal or fall lower than 5 per cent above the same base, which means that there was the most perfect balance in industry that has been achieved, and it is significant to add that the November figures showed business 7 per cent above normal.

KEEN COMPETITION EXPECTED

An outstanding prediction for 1927 is that heavy manufacturing will begin within the next 30 to 60 days, in which there is every reason to believe the manufacturers serving the electrical field will participate. The latest estimate of the three foremost manufacturers of electrical equipment indicates that the traction field will progress consistently. Reports from the Southeastern states are to the effect that there will be increasing demand for electric service. Keen competition is expected during the coming year, but it is thought that lower money rates, cheap, efficient transportation and an abundance of raw material will enable the manufacturers to face the situation.

While there is unrest in railroad and mining labor circles, mediation, it is believed, will prevent any serious conditions. As regards the latter situation, if the coming Miami conference should fail to establish a satisfactory wage, there still will be no chance of a coal shortage, as the extension of the non-union territory has brought about more rail outlets than in 1925, when the carriers estimated they could handle 8,000,000 tons of coal weekly. This figure is raised to 9,000,000 tons for 1927, contingent upon the men staying at work in the non-union territory. In all events, there is 85,000,000 tons above ground.

Turning to prophecies made during the last two weeks, one authority bases his bright outlook for 1927 upon the following factors:

1. The country's undiminished consuming power.
2. Growing evidence of new and highly conservative practices in trade.
3. Great productivity of the soil.
4. No political disturbance.
5. The condition in Europe. Rapid progress toward general restoration of sound character.

This same authority, however, suggests that the existence of prosperity does not prove the improbability of reaction; on the contrary, prosperity long continued may invite it. Experience is wholly against the perpetual continuance of interrupted trade activity.

Reports during the past two weeks reveal some interesting sidelights on raw materials used in the electrical industry. Copper prices, as a result of heavy world production and stock demand, are back to the low level of 1926. Lead and zinc are low, tin is slightly firmer. Rubber has encountered profit taking as the result of increase in stocks and because of small demand by manufacturing interests. Stock in London, as quoted Jan. 7, was 48,745 tons, compared with 43,332 tons in the previous week. President F. R. Henderson of the Rubber Exchange of New York attributes the strength of rubber to the technical position of the market rather than the artificial influence of the $40,000,000 American pool.

As far as it can be judged at this time, the crude oil situation is very favorable due to Nature having come to the relief of the oil supply last summer, with the result that there is now 765,000,000 barrels or more credited to the total of 1926.

According to W. C. Teagle, president of the Standard Oil Company of New Jersey, "the remarkable gain in production has been due mainly to the development of three major pools in the latter half of the year. These are Panhandle and Spindletop in Texas and Seminole in Oklahoma. How important they have been in effecting a change in the statistical position may be judged from the fact that they were doing 70,000 barrels a day on July 1 and by Thanksgiving were producing more than 367,000 barrels daily."

As far as steel is concerned, there are conflicting predictions for the next twelve months. A distinct increase in buying, however, marked the first week of January. This is attributed to the passing of the inventory date, rather than to any material change in consumptive requirements. The change is sufficient, it is thought, to make it certain that January steel production will materially exceed the December figure, reported as 347,200 tons, which represents an operating rate of about 75 per cent.

Additional $3,000,000 Asked for San Francisco Lines

Extensions of the Municipal Railway line to cost $3,000,000, in addition to extensions recommended several weeks ago and estimated to cost $3,500,000, were urged upon the public utility committee of the Board of Supervisors recently by various citizen committees, leagues and individuals.

The extensions requested were:

A crosstown line in the Sunset district; an extension from 24th and Church Streets over 24th, Conrad, Sussex and Elk Streets and along Sunnyside Heights; extension of the Potrero Avenue line over the Ocean Shore right-of-way to the southwestern corner of the city; extension of the Potrero Avenue line to 23d and Wisconsin Streets; extension of the same line through Bayview district; an extension through Moraga Street and also a new line following the general routes of Eureka and Diamond Streets.

International Steel Tie Books 50 Per Cent of Last Year's Orders

With only two weeks of the new year passed, International Steel Tie Company has booked business for 1927 equal to 50 per cent of last year's total, according to William P. Day, president. These bookings include ties for 23 miles of tie laying for the Kansas City Public Service Company. The order represents more than 20,000 ties and is part of the traction company's $6,600,000 rehabilitation program. President Day reports that orders for last year totaled 80,000 ties.

Rolling Stock

Chicago, Aurora & Elgin Railroad is rumored as about to place a large order for coaches. Since coming under the management of Samuel Insull and associates ten months ago, the company is said to have spent more than $1,000,000 in improving service.

Brooklyn-Manhattan Transit Corporation is considering the improvement of its rapid transit lines with 50 articulated cars, each of these 50 units to have three sections. The cars will be duplicates of the 67 units now on order, which were described in this paper in the issues from Sept. 19 to Dec. 26, 1925.

Tampa Electric Company, Tampa, Fla., has received ten new street cars from the American Car Company of St. Louis. The new equipment, which is of the Birney safety car type, has been placed in operation on the Belmont Heights line.

Track and Line

Dallas Railway, Dallas, Tex., has started work on the extension of the Oak Lawn line, which comes under Everman plan No. 4. This eight-block extension, which will cost $40,000, is expected to be in operation in two months.

United Railways, St. Louis, Mo., and the City of Maplewood, Mo., have been authorized by the Missouri Public Service Commission to construct a crossing over the tracks and right-of-way of the railway at Fork Avenue in Maplewood.

Georgia Railway & Power Company, Atlanta, Ga., plans to extend the car-line on West Fair Street, a distance of about ½ mile. The extension is necessary, the petition sets out, to give service to the residents of a rapidly growing section.

Twin City Rapid Transit Company, Minneapolis, Minn., plans to spend $600,000 on railway extensions, bus lines and improvements in 1927, according to an estimate recently submitted to the Minneapolis City Council. Petitions and requests from various neighborhoods for street railway improvements have been submitted to the committee on street railways. One of the major projects is the connection of the Franklin Avenue line in Minneapolis with the Rondo-Maria line in St. Paul to provide another interurban line. Last year the company spent $650,000 on various improvements.

Trade Notes

H. C. Mode has been added to the railway division staff of the American Brown Boveri Electric Corporation at its Camden, N. J., plant. Mr. Mode is a graduate of Cornell and for the past twenty years has been connected with the Westinghouse Electric & Manufacturing Company in Pittsburgh and Philadelphia.

J. R. Thompson, formerly acting works manager of the Trafford Works of the Westinghouse Electric & Manufacturing Company, has been promoted to works manager of the same plant, according to announcement made recently by Vice-President H. C. Davis. The appointment is to take effect immediately.

National Railway Appliance Company of New York City and the Yellow Truck & Coach Manufacturing Company of Chicago announce their sales agreement as terminated effective Jan. 10. H. E. Listman, vice-president of the Yellow Manufacturing Sales Corporation, states that his firm is establishing a district sales organization in New York City, with offices at 33 West 42d Street. R. E. Fielder is being placed in direct charge of sales of what is to be known as the Eastern section, which includes all of New England, New York State, New Jersey and practically all territory east of Pittsburgh. Mr. Fielder is one of the pioneers in the bus field, having been identified with this industry almost twenty years. He first served as a designer for the London General Omnibus Company. Following this experience, he was chief designer of the bus division of the Daimler company for two years. He then became an associate of Colonel Greene in the service of the Fifth Avenue Coach Company, where he remained for fifteen years. For four years he was chief engineer for that company. Following this service Mr. Fielder went with the Yellow Coach Company of Chicago, where he had entire charge of the sales engineering division, training district sales representatives in transportation and engineering design. During the past two years Mr. Fielder has spent considerable time in Europe and Porto Rico making traffic surveys and engineering studies.

Archibald H. Ehle, formerly general domestic sales manager of the Baldwin Locomotive Works, Philadelphia, Pa., has been promoted to vice-president in charge of domestic sales. Mr. Ehle, after graduating from the Massachusetts Institute of Technology, joined the Baldwin forces as an apprentice in 1902, working for some time thereafter in the shops connected with the Highway Department. Later he was put in charge of the power house, from which post he went to the sales department in charge of locomotives. His appointment as general domestic sales manager followed this last period of service.

F. A. Estep has been elected chairman of the board of directors of the R. D. Nuttall Company, a subsidiary of the Westinghouse Electric & Manufacturing Company. Mr. Estep was president and treasurer of the company for years. Coincident with this promotion the duties of treasurer were added to those of Vice-President Ruppert.

Shops and Buildings

Brooklyn City Railroad, Brooklyn, N. Y., has a program for repair shop rehabilitation and re-equipment during 1927 which calls for an expenditure of approximately $500,000. Most of this sum will be spent at the 52d Street shops. This rehabilitation program for shops begun some year ago, and during 1926 the company renovated its Fresh Pond shops at a cost of about $100,000. The changes increased the capacity of the shops about 20 per cent, though enabling the company at the same time to reduce its working force by about fifteen men. The result was secured through introducing labor-saving machinery and otherwise improving the facilities for the maintenance of the rolling stock.

Portland Electric Power Company, Portland, Ore., is calling for bids for a garage to be built one block from the company's Hawthorne building on East Water Street. The structure will be of steel frame and will have 26,000 ft. of floor space. The building is for the purpose of storing all the regular equipment of the company's auto supplies in addition to 100 cars and buses. The cost of construction has been estimated by officials of the company at $45,000.

Toledo Traction Company, Toledo, Ohio, has acquired a new bus storage garage on Tracy Street near Oakdale Avenue. It was formerly the plant of the Automotive Tractor Company. In addition to the storage space for the 30 buses in service at Toledo the new garage has repair and supplies departments.

ELECTRIC RAILWAY MATERIAL PRICES—JAN. 11, 1927

Metals—New York

Copper, electrolytic, cents per lb.	13.025
Lead, cents per lb.	7.65
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.17
Tin, Straits, cents per lb.	66.75
Aluminum, 98 or 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.50
General service	32.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$5.275
Somerset mine run, Boston	2.575
Pittsburgh mine run, Pittsburgh	2.125
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.425
Kansas screenings, Kansas City	2.35

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, $\frac{9}{16}$ in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars cents per lb	2.75
Rail bolts and nuts, cents per lb.	4.20
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (24 gage), cents per lb.	2.90
Sheet iron, galvanized (24 gage), cents per lb.	3.75
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.07
White lead in oil (100 lb. keg), cents per lb.	14.50
Turpentine (bbl. lots), per gal.	$0.083
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.25
Rubber-covered wire, No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, cents per lb.	17.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$142.40
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	10.375
Light copper, cents per lb.	9.00
Heavy brass, cents per lb.	6.625
Zinc, old scrap, cents per lb.	4.125
Lead, cents per lb. (heavy)	6.25
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	15.50
Rails (short), Chicago, gross ton	16.75
Rails, (relaying), Chicago, gross ton (6 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	6.75

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, January 22, 1927 *Number* 4

Mid-West Association Sets a Mark for Sectional Meetings

THE value of sectional association meetings for getting department heads and their assistants off the job and giving them a fresh and broadened viewpoint of their work was stressed by F. G. Buffe, vice-president in charge of operation Kansas City Public Service Company, at the recent meeting of the Midwest Electric Railway Association in Tulsa. Mr. Buffe maintained that the programs of such meetings should be built with a primary view to making them conferences on the improvement of service, building business and the analysis of methods developed by properties which have succeeded in improving their earnings.

Unquestionably this is a sound basis for sectional association work. In such meetings there is an opportunity for a much more intimate and general discussion of business building topics than can take place in a large national meeting. In these smaller meetings there is time for the department heads and their assistants to take an active part and to acquire direct contact with the most progressive thinking in their territory. They are led thus to look on the problems of their company as a whole, and to visualize the part which their individual departments play in the general success or failure. This makes for greater teamwork within the respective company organizations. In teamwork plus imagination lies the industry's salvation.

As Mr. Buffe pointed out, the discussion of detailed questions of technical practice have limited value in such a meeting. Little definite information is conveyed in the average convention paper on construction or maintenance practice. By reading of the practices of other properties in the technical press, where specific illustrations and figures are made available, much more ground can be covered in a given time and at vastly decreased expense than in a convention meeting. Where this does not suffice, personal visits to neighboring properties for first-hand inspection of new practices will yield far more actual information than can be gleaned from listening to the monotonous reading of a convention paper couched in generalities.

Those who attended the Tulsa meeting listened to a recital and discussion of operating practices which have improved the service, increased business, raised the employee morale and reduced costs on properties which have made definite and outstanding progress. Department heads and their assistants joined with general executives in questioning speakers and in discussing the subjects presented. The net result was a distinct inspiration to every man present. The program helped to take each man out of his individual job and to give him a better picture of the tendencies and opportunities in the industry of which he is a part. President Sawyer of the American Association commented on the excellence of the Midwest program, but pointed out that there were not enough railway men present from the territory covered by the association. It was noticeable that some of those properties which seem to be in greatest difficulty were conspicuous by the absence of their men. This very fact illustrates the value of such meetings and indicates the source of trouble on some properties. Their personnel needs to get out of the rut.

Truths Not Likely to Fail of Their Purpose

TWO addresses more stimulating than those of President Sawyer and Mr. Graham, made before the Midwest Association, have seldom been heard by audiences of electric railway men. Some may be inclined to judge Mr. Sawyer's remarks in the light of exhortation. Granting even that, they were not more so than the occasion demanded. As a concomitant to them was the record of accomplishment outlined by Mr. Graham. After all, it is the will to do that is important. But greater even than this is the preachment, pronunciamento, or whatever one cares to call it, that kindles the will to do where signs are not lacking that it is dormant or perhaps nearly dead.

As Mr. Sawyer indicated, commiseration seldom accomplishes much. The psychologists know this. On the other hand, the physiologists know that where there is not a malignant growth the patient is often assisted most by being helped to regain his sense of proportion. Pathologically speaking, there have been few tumors on the brain in this industry, but in far too many cases there has been ingrowing inhibition. Carrying the idea to the extreme, perhaps, Mr. Sawyer said that the fact that we have always done a thing in a given way is good reason for questioning the wisdom of that practice. It certainly is. But there is nothing to be gained merely from change for the sake of change. It is necessary to apply the criterion of fine discrimination.

Take the case of the question of the use of new cars. Mr. Sawyer says that the money spent for new cars and new facilities has been a profitable investment in every instance where it has been intelligently applied. The preponderance of the evidence is on his side. There has been far too much parsimony in this industry in the past. Its practice has become almost a fetish. Economy is one thing, but parsimony is something quite different. Unfortunately, the two had been allowed to become confused in the minds of many railway men. Too often have they thought they were practicing the one when in reality they had become the victims of the other. If Edmund Burke were the diagnostician of the industry's ills he would say that the railway operators have been more inclined to saving than to selection; that their so-called economy required no providence, no sagacity and no judgment, but a mere instinct, and one not of the noblest kind. Mr. Burke's definition of economy and parsimony has perhaps never been surpassed. Real economy, in his opinion, has larger views. It demands a discriminating judgment and a firm, sagacious mind.

Does all this seem elementary? The answer is "yes." But it is the distinction between the two that Mr. Sawyer and Mr. Graham have sought to bring home by being specific. That is the nub of the whole matter. The public must have public transportation service. As for the electric railway industry, it is trying to learn how to do a better job than it has been doing, and the man who misses this point in a convention is missing the very reason for his attendance at a meeting of this kind.

Certainly these two addresses by Messrs. Sawyer and Graham take high rank among the outstanding papers of their kind presented at utility conventions in recent years. It is well to recall that Guizot, the great French historian and economist, said: "Truth has already trouble enough in penetrating to the council of kings; let us not send it there pale and feeble; let it be no more possible to mistake it than to doubt the loyalty of our sentiments." And he would, indeed, be a doubter who questioned for a moment the loyalty of the sentiments of either Mr. Sawyer or Mr. Graham. They did not send truth out pale and feeble. As they handled truth it should not fail of its purpose.

Blair Plan for Chicago Transit Development Extends Over 22 Years

WITH but a few days remaining before the termination of the franchise, bonds and operating agreement of the Chicago Surface Lines the Council of that city is still talking about plans. This week the billion-dollar plan of Henry A. Blair, president of the Chicago Surface Lines, was presented to the Council committee on local transportation and underwent the first fire of criticism. The plan was not entirely new, as an outline was submitted to the Council in 1924 by Mr. Blair.

This plan, however, has been developed and augmented during recent weeks, largely in conference with other transportation representatives, so that at present it is said to meet with the tentative approval of other transportation authorities in Chicago.

A study of this plan, abstracted elsewhere in this issue, has the ring of genuineness. In it Mr. Blair fearlessly faces Chicago's civic needs and forecasts resulting transportation requirements up to 1950. The plan contemplates progressive development in three periods extending over 22 years, by which time the population of Chicago will have reached 5,000,000, according to conservative estimates. Even at this juncture the investment would be only $145 per capita, far below what it is in New York today, with essentially the same population as that estimated for Chicago in 1950, and even though much of New York's subway construction was accomplished in an era of lower costs.

From the initial total investment of slightly more than a quarter billion of private capital, the subways, rapid transit extensions, plus the surface lines extensions, and the addition of 60 miles of bus routes would equal $1,000,000,000 by 1950, approximately 56 per cent of which would be company investment and 44 per cent would be obtained from public funds.

Considering the merits of this plan from the standpoint of Chicago's economic development, which after all is the important factor, the program stands out in sharp contrast to the $50,000,000 or $100,000,000 contemplated in the Lisman proposal. If this larger plan is necessary to provide for Chicago's growth, and there seems to be agreement among the present leaders who are providing transportation today that it is, then it appears more impossible than ever that such a program can be contemplated on a 20 or even a 30 or 40-year basis. The present dilemma is evidence enough that an extensive development could never be consummated if progress must be halted periodically and the invested capital held in jeopardy while a new deal is made.

How Paris Approaches Rush-Hour and Other Operating Problems

ELECTRIC railway transportation problems in Europe are very much like those in this country and are being approached largely in the same way. This is clearly indicated by the article in this issue on "Increasing Car Speeds and Rush-Hour Carrying Capacity" by Paul Mariage, commercial manager of the Paris tramway and bus system. It shows, for example, that equal importance is laid in Europe as in this country upon the need of increasing car schedule speeds. It also shows that in Europe the answer to this question is felt to lie largely in a type of car designed especially to speed up the rate of passenger interchange and simplify the collection and registration of fares. Mr. Mariage's article also indicates that a great deal of care and thought are being given in Paris to means for increasing the rush-hour capacities of the company's system without unduly increasing the total number of cars and buses owned.

In these efforts, Paris tramway managers labor under some handicaps which to American managers would appear to be rather serious. One of these is the narrowness of the cars, made necessary because of the narrow streets through which they run. A second is the need, felt at least in Paris, for providing for two classes of passengers on every electric motor car and on the 36 and 48-passenger buses. Only on the trail cars and on the 25-passenger express type of buses are the passengers all of one class. A third handicap to rapid operation in Paris is the large variety of fares which have to be collected. Their number makes prepayment fare collection hardly possible.

Nevertheless, the Paris authorities have a number of accomplishments to their credit. They have produced a car the height of whose floor above the street is practically the same as the diameter of the wheels used, the car being boarded by a 14.4-in. and an 8-in. step, there then being a 10-in. riser to the main car body. With smaller diameter wheels than those used, it would seem as if these heights could be reduced materially. Paris also has a spacing between stops of about 820 ft. in the central portions of the city and 1,150 ft. in the outskirts, with good records for shortness in length of time of car stop. One reason for the latter condition is undoubtedly the very clear marking of stopping points, as mentioned in the article.

Problems of rush-hour capacity and provision of rush-hour crews are similar to those here. Among the solutions considered for the former (adopted elsewhere in Europe but not yet in Paris) may be mentioned that of folding seats which are turned up in rush hours to increase the carrying capacity of the cars. The principal solution for the rush-hour crew problem in Paris is the employment on the cars for short periods each day of employees in other departments than the transportation department. Thus, shopmen are being used as motormen, and members of other departments do miscellaneous transportation duties during the rush hours.

Philadelphia May Show the Way to Relief of Traffic Congestion

COMMENDABLE spirit has been shown by the various merchants' organizations in Philadelphia. Faced with a deal of strife and recrimination over the rigid anti-parking ban which was proposed by Director of Public Safety Elliott, nearly all of the groups agreed to accept a 30-day trial period for the measure. Evidently the director is gifted with a very persuasive tongue, for it was only after he had met with the Market Street Merchants Association at a luncheon held on the day scheduled for the final Council hearing on the bill that the organized opposition began to fade. He showed beyond peradventure that some radical steps were inevitable if complete traffic stagnation on the alley-wide streets of the city were not to result, and suggested that a trial be given to the parking ordinance over a limited period of time and with a reasonable program of enforcing the measure progressively over the downtown streets.

When the bill came before the City Council for its final hearing it was passed unanimously and later signed by Mayor Kendrick. Much local interest had been aroused because of the sweeping restrictions placed by the new ordinance. It forbids parking for periods longer than are required to load and unload passengers or to discharge merchandise in practically the entire downtown section of Philadelphia between the hours of 7 a.m. and 7 p.m.; it forbids parking at any time on streets less than 20 ft. in width and specifically names certain streets falling in this category; finally, it forbids any parking on the city streets between the hours of 3 a.m. and 6 a.m.

A peculiar situation had existed in Philadelphia prior to the passage of the bill. While the firms on some of the major thoroughfares were emphatically opposed to any suggestions that parking be prohibited in the vicinity of their establishments, the side street merchants were crying vigorously for relief from the abuse of parking rules. They claimed that they frequently were unable to receive shipments of merchandise, since the delivery trucks were unable to pierce the mazes of traffic or to find unloading space in front of the entrances. Hence some of the strongest advocates of the parking legislation came from the class which has generally shown the greatest opposition to any such proposals.

As is usual with such drastic regulation, a number of points remain to be worked out. Physicians feel that the plan will work a hardship on them and their patients. Ministers of downtown churches are fearful that serious inroads will be made on the attendance. Director Elliott has expressed a willingness to effect modifications in the present ordinance that may be found essential at the end of the trial period.

Similar plans have been tried in other cities with more or less success. Transportation men will watch Philadelphia with much interest, as the enforcement of a satisfactory ordinance there will show that traffic relief through the elimination of parking is feasible. This one thing will go a long way toward solving the congestion problem.

Work of Insurance Committee Demands Fullest Co-operation

EXPERIENCE of electric railway companies in connection with the purchase of fire insurance indicates that much can be done to clarify the situation. The rates vary widely, as was indicated in an editorial in this paper for Nov. 27. Furthermore, the record for 1925 shows that of $2,140,000 paid out in premiums only $607,000 was returned in fire losses, indicating an excessive rate. Improved practices in the construction of cars and structures are constantly tending to make the fire hazard less and less.

Conditions such as these have prompted the committee on insurance of the American Electric Railway Association to go into the matter this year even more thoroughly than it has done in the past. A questionnaire has been prepared and is being mailed out from headquarters requesting every company in the industry to give its insurance history and should reach every railway system within a week. It is of vital importance to the success of the committee's work that it receive an answer from each and every company, whether a member of the association or not. Only with experience of all the companies represented in its collective data can the committee speak authoritatively for the industry or properly represent it.

Nothing but good can come to any individual company by supplying full information. Managements owe it to the owners of their properties to see that the proper officers furnish everything asked for and cooperate with the insurance committee in every way possible.

Keeping Up with the New South

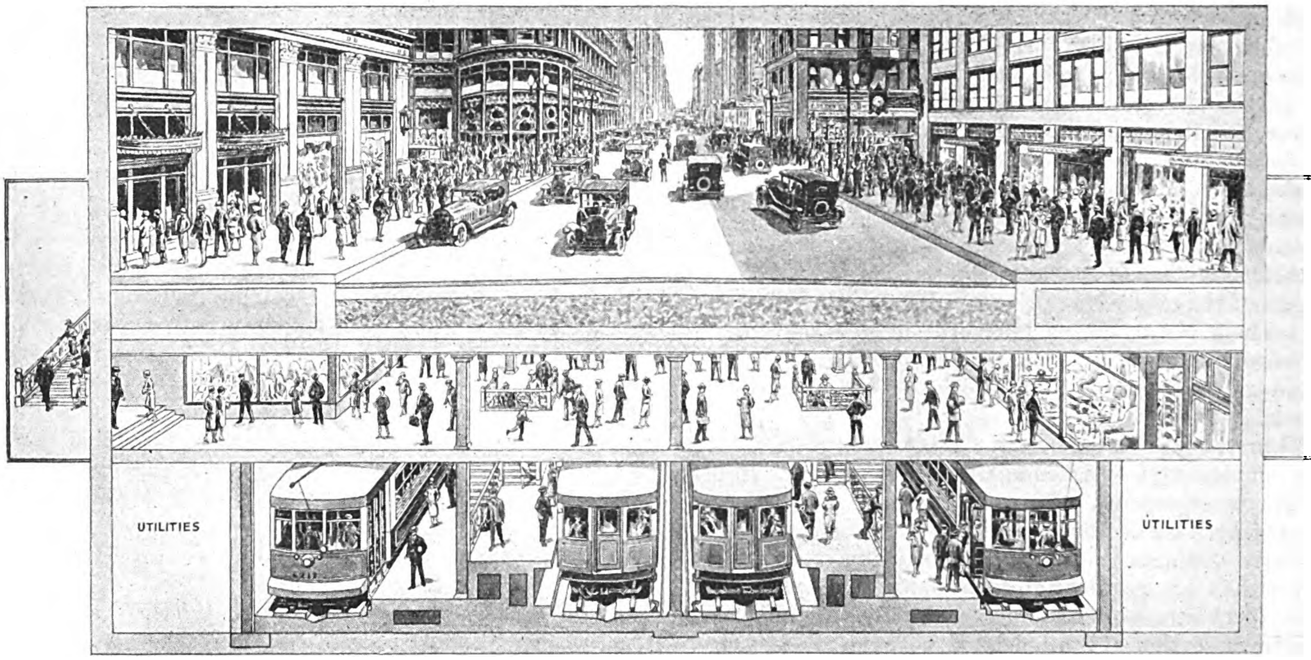
ONE of the builders of the new South was the late James B. Duke. Among his many undertakings was the construction of the Piedmont & Northern Railroad. It was one of the first, if not actually the first, line of its kind in the South, and it has done very well financially. Mr. Duke was ambitious for the road. The line as originally built was to be only the beginning of a much bigger system to be tied in with the gigantic plans he had for power development in the district. It was proposed to connect practically all of the cities of North and South Carolina, running from Greenwood to Durham probably after leaving Charlotte, east by way of Concord, Salisbury, High Point, Greensboro, Burlington into Durham.

The existing links in this system were built in 1912-13-14. Then came the war. Mr. Duke, like many others, had to put aside his personal plans in the interest of the general good. But he never put aside the idea. He harbored it all the while, but before he could perfect the necessary arrangment to carry out the plan he died. Now his associates propose to take up the task where he left off.

The estimated cost of the present undertaking is $15,000,000. By itself this sum bulks large. It is big, but it is only a small part of the vast sums that men of the Duke type have been pouring into the new South in a prodigious stream. It is small wonder that great interest attaches to this latest proposal to build an electric railway of 150 miles to traverse the great industrial belt of Piedmont along the line of what has been called "the workshop of the South."

Billion-Dollar Plan for Chicago Transit

Henry A. Blair, President Chicago Surface Lines, Presents a Plan to Develop the Three Present Systems of Surface Cars, Elevated and Buses—Unified Company Proposed with Terminable Permit Franchise—Report Contains Estimated Budget of Expenditures in Three Steps Extending to 1950 and Presents Estimated Earnings at an Average Fare of 7.35 Cents



State Street, Chicago, Shown in Cross-Section as It Would Appear with the Pedestrian Mezzanine and the Four-Track Subway for Rapid Transit and Surface Cars in Accordance with Plan Proposed by Henry A. Blair, President Chicago Surface Lines

DEVELOPMENT of the three general groups of transportation utilities in Chicago, consisting of surface car lines, elevated railroads and buses, into a billion-dollar system by 1950 is the construction program of a plan of progressive action presented by Henry A. Blair, president of the Chicago Surface Lines. The report containing this enormous program has been developed in recent months through conferences with the major interests involved and is said to have the general approval of these parties.

Subways with sub-level pedestrian concourses, extension to rapid transit lines, ultimate removal of the elevated loop, surface car line terminals and extensions with the buses used as feeders and for light line operation are all included in the plan. The report is worked out on the basis of three periods, 1928 to 1935, then 1935 to 1940, and the final period 1940 to 1950. Investments at the beginning of the period, standing at $273,000,000, will swell to $1,003,626,000 by 1950. The final total would be divided $563,274,000 as company investment and $440,352,000 as city investment in the permanent structures of the subway and elevated lines.

Table III, on page 156, shows the estimated investments detailed by periods for city and company considered necessary by Mr. Blair to accomplish the plan and to provide adequate transportation for the 5,000,000 citizens conservatively estimated for 1950.

The first necessary step is to obtain the passage of enabling legislation by the Illinois General Assembly to permit the granting of a terminable permit type of franchise. Legislation is also necessary to authorize the consolidation of the surface line companies, chartered under the street railway act, with the elevated lines, chartered under the railroad act; to extend the powers of the city relative to special assessments, and to remove the 20-year limitation on the right of the city to lease city-owned railways.

Following this legislation the second step would be to effect the consolidation of the present companies into one, and the third step to grant a terminable franchise to the one recognized corporation, to remain in effect during good behavior or until the city should exercise its option to purchase.

It is estimated that such unified operation could be accomplished on an average fare of 7.35 cents, with free transfers between the lines of each basic type of system

TABLE I—CONSTRUCTION PROGRAM FOR CHICAGO DIVIDED INTO THREE PERIODS USED IN THE BLAIR REPORT

	Structure Miles
For the period 1928 to 1935	
Elevated	16.71
Joint occupancy in subways	5.86
Rapid transit subway	3.43
Surface car subway	4.45
For the period 1935 to 1940	
Subways	9.92
Elevated	21.45
For the period 1940 to 1950	
Subways	7.76
Elevated	56.74

and eventually between all services. On the schedule outlined a maximum fare of 7.71 cents will be reached in 1933 and the minimum fare of 7.06 cents in 1950.

THE PHYSICAL PLAN

Pending the construction of subways 1,000 new cars of a larger type would be purchased for the elevated system and 600 for the surface lines.

Immediate construction of four units of subways and elevated lines would be started. This would include a four-track subway in State Street from North Avenue to 23d Street, a four-track subway under Washington from Ogden to Michigan, with a two-track extension to a loop under Grant Park and another two-track extension under the park just east of Michigan Avenue to connect with a two-track subway under Adams Street. The Adams Street two-track subway would extend west to Halsted Street. The fourth unit would be a two-track elevated line extending from the present structure at Harrison Street east of State, along Harrison and Wells to Wells and Van Buren, where it would connect with tracks on Wells Street at separate levels. This unit would serve until such time as funds would be available for a subway along the west side of the central district.

These units are classed as the most urgent and should be provided immediately. The State Street subway would be used for both rapid transit and surface cars. This step will relieve part of the present elevated structure and give two rapid transit entrances into the city from the north and the south. The street surfaces would be relieved by the removal of many surface cars. The west side would be helped in thus having more use of the elevated structure and the full use of the surface car subway in Adams Street.

TABLE II—ESTIMATED USE OF THE PROPOSED TRANSPORTATION UNITS BY YEARS

	Passengers Using Surface Cars or Buses for All or Most of the Ride	Passengers Using Rapid Transit for All or Most of the Ride	Passengers Using Both Types of Transportation for the Ride
1926	870,000,000	224,500,000	....
1935*	955,000,000	390,000,000	140,000,000
1940*	1,073,000,000	475,000,000	194,000,000
1950*	1,200,000,000	800,000,000	400,000,000

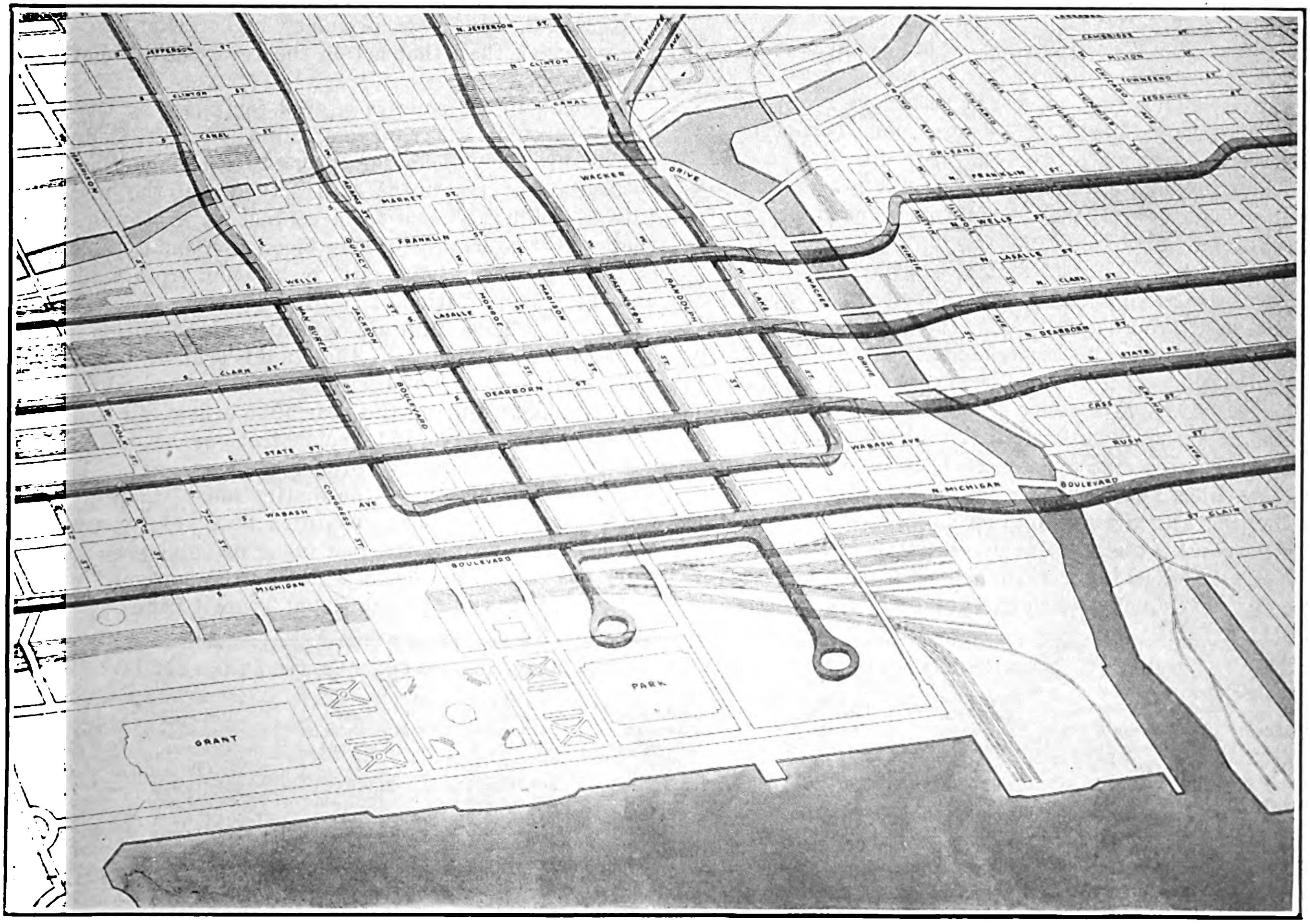
*Fares collected would not be divided as these columns show when under the consolidated plan.

One of the important features of the State Street subway is the pedestrian mezzanine extending from building line to building line with direct entrances to stores and buildings facing State Street. The three kinds of traffic will thus be essentially separated on State Street, the vehicles on the street surface, pedestrians on a level below and rapid transit and surface lines below that. This is well illustrated by the cross-section view.

FUTURE CONSTRUCTION

Following the immediate subway units, other tubes should be started on Lake, Wabash, Van Buren and a cut-off along Milwaukee from Paulina to Lake. When completed these units will permit the removal of the present elevated loop. The table on page 154 shows the miles of structures to be built in each period.

The report points out that not all of the development would be confined to the central district. In the first three years there should be 40 miles of track extensions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STATE ST.
N. STATE
WABASH AVE.
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ORLEANS
CASS
RUSH
GRAND
ST. CLAIR
HARRISON
VAN BUREN
JACKSON
ADAMS
QUINCY
MONROE
MADISON
WASHINGTON
RANDOLPH
LAKE
CONGRESS ST.
POLK ST.
GRANT
PARK

Subway Development by 1950 in the Central District of Chicago as Proposed in the Blair Report

Table III—Estimated Investments by the Company and the City for the Three Periods from 1928 to 1950

	Company Investment		City Investment		Cumulative Total Investment
	Period	Total	Period	Total	
Company's original investment	$273,000,000	$273,000,000	....	....	$273,000,000
First period—1928 to 1935	113,902,000	386,902,000	$172,920,000	$172,920,000	559,822,000
Second period—1936 to 1940	62,520,000	449,422,000	110,034,000	282,954,000	732,376,000
Third period—1941 to 1950	113,852,000	563,274,000	157,398,000	440,352,000	1,003,626,000

and 60 miles of streets supplied with bus transportation. During the same period 600 old surface cars should be replaced, at the rate of 200 per year. Other cars will be altered during this period as to the arrangement of doors, platforms, etc., to make them more convenient. Other improvements cited are loop terminals at turn-back points, feeders, substations, new carhouses, additional shops and equipment and additional service equipment.

Improvements to elevated lines involve the purchase of 1,000 large and modern cars, the installation of a complete track signal system with automatic control and the rearrangement of routes and station layouts to provide better accommodations for the traveling public.

FINANCIAL FEATURES OF THE PLAN

The assumed base capital of $273,000,000 at the beginning of 1928 is the certified capital of the Surface Lines group and the Chicago Rapid Transit plus the additions to the capital account of $8,000,000 that will be made before the plan becomes effective. Some $5,000,000 of this additional capital will be allocated to a stabilizing fund.

The city will provide the funds for the subways and elevated structures from special assessments or otherwise and the consolidated company will provide the funds for equipment, consisting of tracks, cars, electrical facilities, ventilating apparatus, drainage systems, station equipment, substations, shops, yards, carhouses and other miscellaneous property used in operation.

Amortization of part of the company's capital has been provided for at the rate of 1 per cent of the capital account annually from 1933 to 1937, 1½ per cent from 1938 to 1942 and 2 per cent thereafter to 1950. The yield is to be applied to the retirement of mortgage bonds. By 1950 a total of $134,237,000 will have been accumulated and the retirement of bonds thus made possible will reduce the fixed charges and also the purchase price should the city decide to exercise its option.

Operation will be essentially on a service-at-cost basis and therefore public benefits such as the 55 per cent of surface lines net earnings, paving, street cleaning and sprinkling and similar indirect taxes have not been included, since these are considered unfair burdens on the riders. Likewise no return has been contemplated on the city investment, since the building of rapid transit facilities is considered in the same category as additional streets or analogous to street-widening projects.

While many courts have established 8 per cent as a fair return on invested capital, 7½ per cent is suggested in this report.

By 1950 the total investment in rapid transit will be $145 per capita, which is not considered excessive.

Chicago Rapid Transit Takes Leading Part in First-Aid Campaign

THE first-aid training school conducted by the Chicago Rapid Transit Company, Chicago, Ill., under the direction of Dr. Hart E. Fisher, head of the medical department, graduated nearly 300 student-employees during 1926. Regularly constituted members of the board of examining physicians of the American Red Cross are in charge of the final test to which each employee is submitted before he becomes eligible for a first-aid certificate. All classes of Rapid Transit employees, trained for any emergency, any time or at any place, passed the rigid Red Cross examinations. With more than 100 other employees already enrolled in first-aid courses, this year promises to establish an even higher mark than that set in the record-breaking year just closed.

Included in the courses offered for study by the Red Cross through the Chicago Rapid Transit Company school are the Schaefer prone-pressure method of resuscitation; treatment of fracture and the application of splints; rescue from contact with electric current, and treatment; stopping blood flow and application of roller and head bandages; restoration from fainting, and the transportation of injured.

Not only have first-aid educational activities been centered on employees of the Rapid Transit Lines but considerable effort has been expended toward education of the public. During the year 1926 a first-aid team of picked experts gave 184 demonstrations before public gatherings aggregating 87,000 persons. The Rapid Transit Lines also have the distinction of having won the Chicago city championship in first aid for two of the last three years. Interest taken by employees in the work has caused the school to set a "100 per cent" mark in first-aid training on the Rapid Transit Lines.

TABLE IV—ABSTRACTED EARNINGS STATEMENT ESTIMATED FOR CHICAGO'S CONSOLIDATED TRANSIT

Calendar Year (1)	Revenue Passengers (2)	Operating Expenses, Taxes and Renewals (3)	7½ Per Cent Return on Average Net Company Capital (4)	Amortization on Average Capital* (5)	Total Columns 3, 4 and 5 (6)	Less Miscellaneous Earnings (7)	Required Passenger Revenue (8)	Average Fare, Cents (9)
1927	1,115,400,000	$64,268,000	$20,475,000	....	$84,743,000	$1,924,000	$82,819,000	7.42
1930	1,190,000,000	67,977,000	22,083,000	....	90,060,000	2,053,000	88,007,000	7.39
1935	1,345,000,000	71,650,000	27,952,000	$3,819,000	103,421,000	2,320,000	101,101,000	7.52
1940	1,548,000,000	80,661,000	30,621,000	6,651,000	117,933,000	2,670,000	115,263,000	7.45
1945	1,767,500,000	90,744,000	31,313,000	9,875,000	131,932,000	3,036,000	128,896,000	7.30
1950	2,000,000,000	101,382,000	32,110,000	11,136,000	144,628,000	3,450,000	141,178,000	7.06
						Average fare	....	7.35

* The amortization fund starting in 1933 will total $134,237,000 by 1950.

Increasing Car Speeds and Rush-Hour Carrying Capacity*

A Discussion of Various Factors Which Enter Into These Two Matters, with Particular Reference to Electric Railway and Bus Operation in Paris

By Paul Mariage

Commercial Manager Société des Transports en Commun de la Region Parisienne, Paris, France

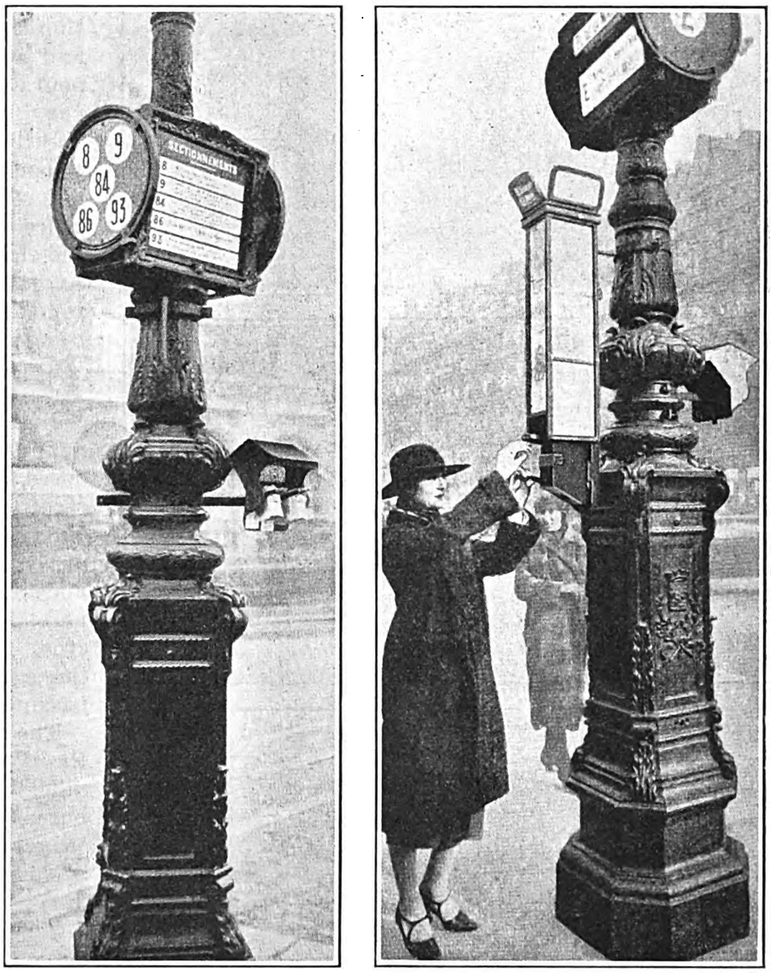
RARELY does the average citizen who finds the use of the bus and tramway car necessary in his daily life realize the extent of the organization required to provide proper service. If he did, he would make greater effort to approve and promote legislation by which the acuteness of the conditions under which local service is given would be lessened. Two problems which vitally concern the economy of electric railway and bus operation are schedule speeds and rush-hour carrying capacity. As increases in each without too great expense are generally sought, particulars of the way in which the problem has been approached in Paris should be of interest. Incidentally, it might be said that the S.T.C.R.P., which operates all the tramway and bus lines in Paris, has 32,000 employees, 128 tramway lines and 75 omnibus lines.

DISTANCE BETWEEN STOPS

In cities with heavy traffic streets the principal factor in causing reduced speed is street congestion. In Paris the schedule speed of the street cars varies from 6.8 m.p.h. to 10.7 m.p.h. and of the buses from 7.3 to 9.4 m.p.h.

In other cities where there is great street congestion, as in Marseilles, London, Brussels and Barcelona, schedule speeds of cars do not differ greatly from these figures.

A second factor which has an effect on schedule speed is the number and extent of the grades and curves on the line. The speed of a car is not only automatically checked as it ascends grades but limits have to be put on the rate of descent. Thus in Paris, buses and cars are not allowed to descend grades at more than 5 m.p.h. when the grade is more than 4 per cent. In Geneva the longest grade is about a mile with an average of 3.35 per cent and the steepest part has an incline of 7.43 per cent for about 250 ft. The car speed permitted, both ascending and descending, is 5 m.p.h. As will be seen, this about corresponds with Paris practice.



Methods of Issuing Queue Tickets in Paris

The illustration at the left shows the long-familiar method used in Paris for determining order in queues of waiting passengers. When a person intending to board a car reaches a stopping point he tears the uppermost number from one of the packages of numbers shown in the illustration, one package being for movement in one direction and one in the other. The numbers are called in order when a car arrives. This plan saves the passenger from taking his place in a waiting queue. The other illustration shows an improved form of number-issuing machine now being tried in Paris. Both illustrations also show the method of marking car stops. The route numbers of cars passing this point are indicated at the ends of the cylindrical looking car stop sign mounted on the lighting pole. The panel at the side gives further details by route numbers of the several routes which pass this particular stopping point.

Schedule speed is also a factor of the time of passenger interchange, and this time, in turn, is affected by the number and sizes of car doors, height of car platforms above the street and other features of car design. It was owing to delays in loading that led to the adoption as the standard in Paris of a center-entrance car with two large doors, low steps and a large passenger entrance reservoir.

The effect of the use of more than one class of compartment on car speeds is open to question. On the other hand, the use of trailers with the same type of entrances as the motor car is thought in Paris not to increase the length of station stops.

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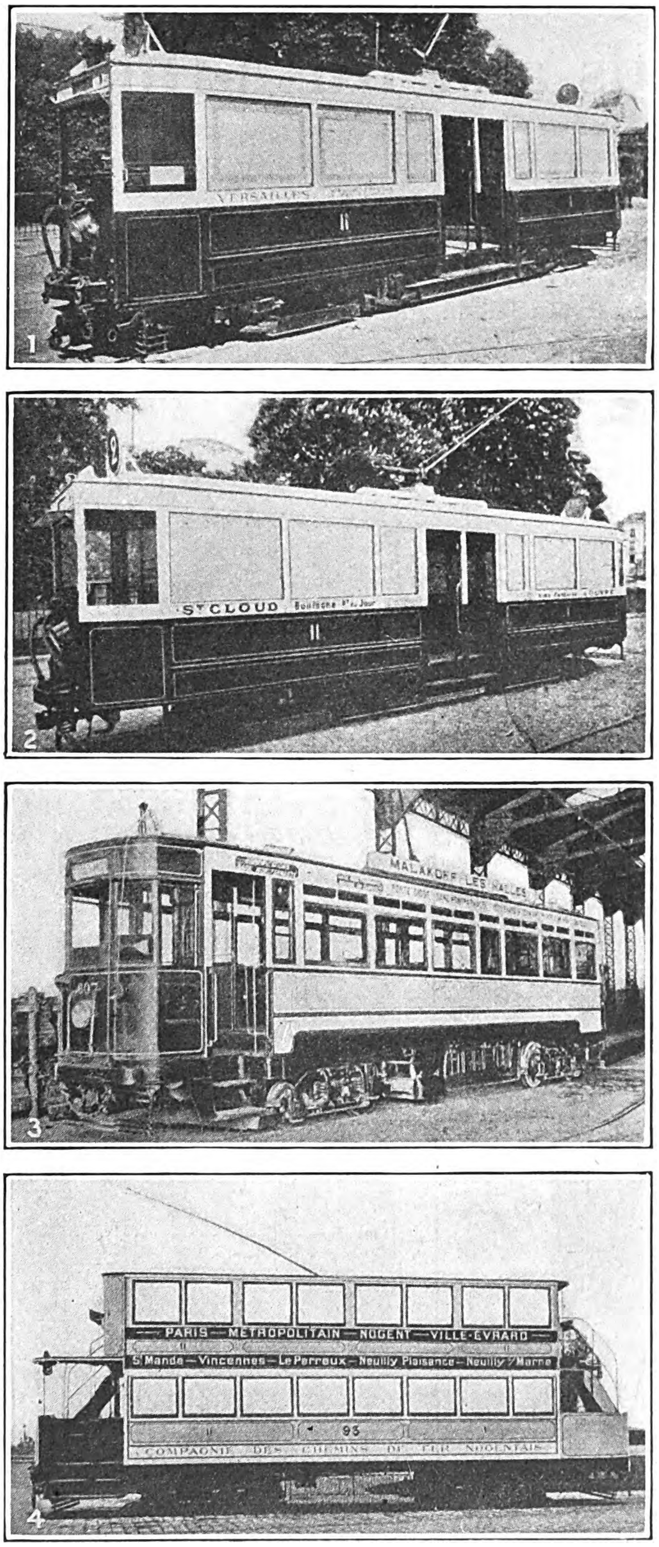
*Abstract of paper presented at the biennial meeting of Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, Barcelona, Spain, Oct. 10-16, 1926.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3
MALAKOFF-LES HALLES
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PARIS — METROPOLITAIN — NOGENT — VILLE-EVRARD
St Mandé—Vincennes—Le Perreux—Neuilly Plaisance—Neuilly s/ Marne
95
COMPAGNIE DES CHEMINS DE FER NOGENTAIS

Types of Motor Cars Used in Paris

The present standards of cars on the Paris Tramway System are the type G car shown in Fig. 1 and the type L car shown in Fig. 2. An extended article about the type L car was published in the issue of this paper for Sept. 11, 1926. Both type G and type L cars have a wheelbase of practically 11 ft. and over-all length of 37 ft. 4 in. Owing to the narrowness of these cars only three people can be seated across a car instead of four as in an American car. Cross seats are used, but the seats are placed back to back. This arrangement is standard in all of the cars except in the double-deckers. The latter have longitudinal seats on both decks. The car shown in the first illustration weighs, empty, 14,850 kg. (32,670 lb.) and that shown in the second 12,800 kg. or 28,160 lb. Both have a capacity of 30 seated and nineteen standing passengers, though in each case there is capacity for four more standing passengers when the car is used as the second car in a train. The car shown in Fig. 3 has a capacity of 32 seated and nineteen standing passengers, and the double-decker in Fig. 4 of 70 seated and four standing passengers. The double-deck types are used only on a few routes in the outskirts of the city, except on special occasions, such as Sundays and holidays in summer.

The method of fare collection undoubtedly is another factor. The fare most rapidly collected is that which can be paid by a single coin. On properties where this fare can be used prepayment with a fare box is the logical method. Unfortunately, railways with zone systems cannot usually follow this plan. In Paris fares are not collected at the entrance, but by the conductor after the passenger takes his seat or standing position. The conductor passes continually from one end of the car to the other calling out "Fares, please." As passengers pay their fares they receive from him fare receipts torn from a pad and punched to indicate the amount of fare paid and the point to which the passenger is entitled to ride. This fare receipt must be held by the passenger during his trip and must be produced at any time when called for by inspectors who board the cars frequently. It is upon this inspection that the company depends for checking over-riding and riding without payment of fare. During rush hours fare receipts are sold by employees of the company to passengers on the street about to board the cars.

Still further to speed the service, the company is considering requiring all passengers to buy tickets before boarding the car. The conductor would then cancel each ticket by a machine which would stamp on the ticket the number of zones for which it was valid. At the same time the machine would automatically register the number of passengers carried by class and by amounts of fare paid.

MEANS FOR INCREASING SCHEDULE SPEEDS

In several cities limits are placed by law on the maximum speeds permitted. Thus in Paris the highest speed allowed is 30 km. (18¾ miles) per hour on through streets and 20 km. (12½ miles) per hour on cross streets. This speed has to be reduced to 8 km. (5 miles) an hour on descending grades of 4 per cent or more, at crossings and turnouts, while crossing switches, when passing points at which stops are usually made, when the tracks cross from one side of the street to the other, when the cars enter congested streets and when they are passing points considered dangerous.

The speed permitted buses varies to some extent with the type of bus used. The maximum of 35 km. (21⅞ miles) per hour is allowed to the smaller and lighter buses, i.e., those with capacities of from 25 to 38 passengers and weighing from 10,500 lb. to 17,600 lb., but at various points all speeds must be reduced, as well as during fogs, over bridges, etc.

Schedule speeds can be increased by shortening the time of passenger interchange and by varying the schedule speed according to the conditions of place and time.

The rate of passenger interchange is speeded up in Paris on the public streets by three means, namely, by the use of safety areas, methods for forming loading queues and special island platforms. The plan of safety areas is followed on a number of properties. The method of forming loading queues in Paris is somewhat peculiar to that city and its value is questionable. Persons waiting to take a car are required to supply themselves at the corner at which they are waiting with numbers which indicate the order in which they are permitted to board the car, provided the latter has spare carrying capacity. Two bundles of these numbers are attached to a post near the stopping point, as shown in an accompanying illustration. Recently, however, an automatic number-issuing machine, also shown herewith, has been put into experimental use, though it has not been in use long enough to determine its value. It has a capacity of 6,000 tickets, as compared with 1,000 in the ordinary distributor. It not only effects an economy of 6 per cent in tickets issued but there is a saving in the time of calling the tickets, since fewer are lost. This cuts down the length of station stops.

In cars which are not of the pay-as-you-enter type the principal features in car design affecting length of station stop are width of doors and height of steps. On the two latest types of street cars built for the Paris system the width of each of the two doors is 34 in. and on the trail cars the width of each of the two doors is 29½ in. The height of the steps is shown in inches in the accompanying table.

TABLE OF HEIGHTS IN INCHES OF PARIS CAR STEPS (LATEST DESIGNS)

	Type G Motor Car	Type L Motor Car	Type A Trailer
First step......	10.8	8.0	9.5
Second step..	14.6	14.4	14.9

On the buses the width of the entrance is 24.8 in. and the height of the first step above the pavement is approximately 14½ in. in a loaded bus and from 17 to 19 in. in an empty bus. In addition to this step, there is a second to the platform and a riser between the platform and the car floor. In the very latest type of bus an effort has been made successfully to provide easier access. By means of a low hung frame the height of the platform has been brought to only about 10 in. above the pavement and between the platform and the car floor in this type of bus there is only a riser.

The second method mentioned above of increasing average schedule speed is by changes in schedule running time according to conditions. In Paris schedule speeds vary with the time of day and parts of the line.

EFFECTS OF INCREASED SCHEDULE SPEED

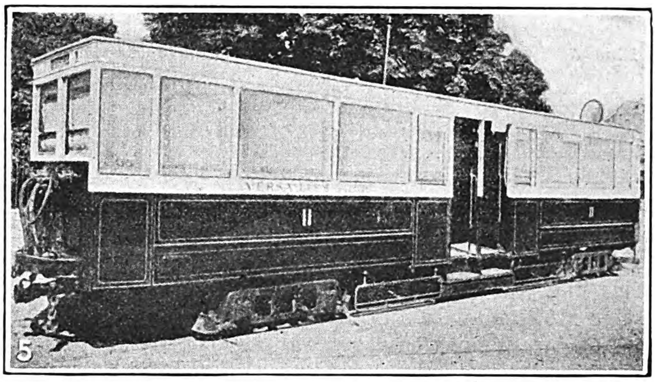
Increases in schedule speed will now be considered as to their effect (1) on traffic, (2) on economy in the use of equipment, and (3) on accidents.

It is very difficult to give any rule as to the effect of schedule speed on volume of traffic because the extent of riding depends on so many causes. Nevertheless, it is only fair to assume that an increase in schedule speed will be accompanied by an increase in patronage, especially of long-distance passengers. Experience indicates that between comfort and speed in travel most passengers would choose speed.

There is also a distinct gain in economy of the use of equipment when the car-miles or bus-miles are increased in relation to the car-hours or bus-hours. Thus a smaller number of cars at high speeds can serve a line at the same headways than a larger number of cars at low speed, with consequent saving in equipment and personnel. On the other hand, higher speeds tend to increase the number of accidents. Comparison of two lines in Paris in which operating conditions were practically the same is shown in the table on page 160.

DISTANCES BETWEEN STOPS

The principle followed in determining the distances between car stops on the Paris system is that the distance should vary inversely to some extent with the density of traffic, although, practically, other factors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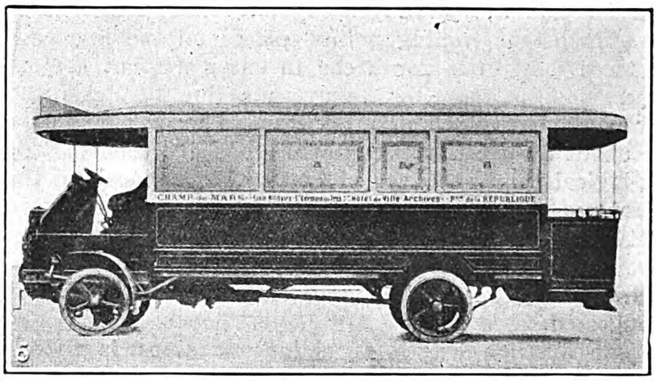
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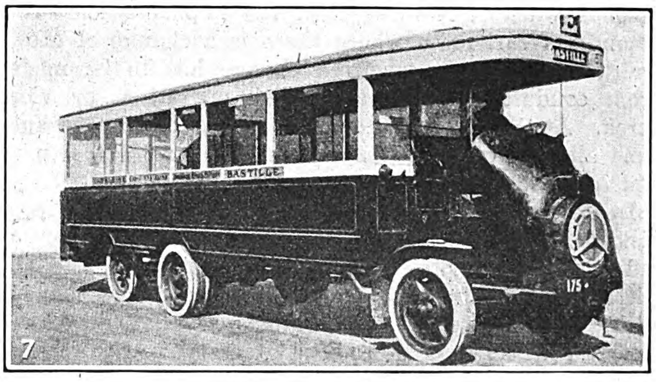
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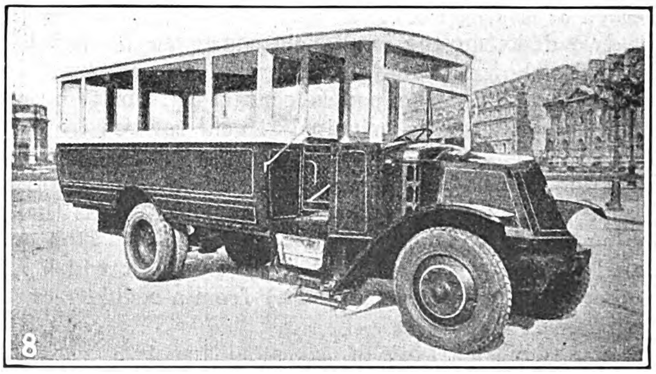
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Double-Truck Trailer and Standard Buses, Paris

Fig. 5 shows the Paris double-truck center-entrance car usually used as a trailer and known as type A. It weighs empty 8,800 kg., or 17,600 lb., and when used as the second car in a train has a capacity of 34 seated and 24 standing passengers. It is designed to carry only second class passengers, whereas the cars shown in Figs. 1 to 4 have accommodations for both second and first class passengers.

Figs. 6, 7 and 8 show the standard motor buses in Paris. Fig. 6 has cross seats back to back and a capacity for 28 seated and ten standing passengers. Fig. 7 has a similar arrangement of seats and capacity for 40 seated and eight standing passengers. The two buses shown in Figs. 6 and 7 have rear platforms and rear entrances. Fig. 8 is the express type of bus with seats for 25 passengers. It has a front entrance and pneumatic tires.

The body of the bus shown in Fig. 6 has a weight of 1,800 kg. (3,960 lb.). The chassis weighs from 5,150 kg. to 5,350 kg. (11,330 lb. to 11,770 lb.), depending upon the type used. The total weight of the six-wheel bus, shown in Fig. 7, empty, is 7,340 kg. (16,148 lb.). The 25-passenger bus shown in Fig. 8, has a weight empty of 5,385 kg. (11,847 lb.).

RELATION OF SPEED AND ACCIDENTS, PARIS

Line A	Schedule Speed in m.p.h.	Number of Accidents Per 1,000 Car-Kilometers
Ordinary service	7½	0.428
Express service	10⅝	0.493
Line B		
Ordinary service	7¼	0.384
Express service	11¼	0.776

have also been considered. Thus, in general, stops must be located at all important street intersections and other like points.

Car stops may be divided into two classes, namely, those where a car would naturally stop and those established by the management as convenient points to receive and discharge passengers. In the first class are important loading points, places on the line considered dangerous for a car to enter without a stop, and zone limits. On the average line in Paris the proportion of these obligatory stops to the whole number is about 30 per cent. Optional stops are then located at logical points between obligatory stops, based on the observed movements of passengers. The spacing used between stopping points is about 250 m. (820 ft.) in the central portions of Paris and 350 m. (1,150 ft.) in the outskirts of the city or where the streets are not congested.

The average length of obligatory stops is fifteen seconds when the speed is less than 12½ m.p.h., twenty seconds when it is more than 12½ m.p.h., twenty-five seconds at carhouses where there is a change of crew and thirty seconds where a change has to be made from conduit to overhead trolley operation, or vice versa. At the optional stops five seconds is the average time allowed where the speed is less than 12½ m.p.h. and ten seconds where it is more than this rate.

In Paris all stops are marked by enameled sheet iron disks attached to the street lighting poles and colored red if the stop is obligatory and green if it is optional. All lighting posts carrying these disks are furnished with green shades over the lamps so that they are distinguishable at night. The latest type of stopping sign is shown in the same illustrations that show the method of issuing tickets to waiting passengers. There are two disks on the lamp pole separated by panels. the disks show the route numbers of the cars which pass that point. The panels contain information by route numbers of the principal streets covered by the cars on each route.

On the bus lines a special stopping rule is in force after 9 p.m., when the traffic on the street is less than during the day. Under this rule any bus will stop on signal to discharge a passenger at any point which is farther away than 50 m. (165 ft.) from a regular stopping point.

Conspicuous marking of car stops has two distinct advantages from an operating point of view. The first is that it collects waiting passengers definitely at one point so that the time of loading is reduced to a minimum. The other is that it makes easier any desired change in the number or position of car stops. Thus, in Paris a study is now being conducted to determine the possibility of reducing the number of stops by about 20 per cent.

INCREASING RUSH-HOUR CARRYING CAPACITY

The means for increasing rush-hour carrying capacity which appear to be most important are as follows: (1) Increase in the number of cars and the employment of cars of larger capacity, (2) increase in schedule speed, (3) short routing of cars, (4) use of cars with folding seats, (5) establishment of express or direct service.

The first method, increase in number of cars or use of larger capacity cars, is followed on the Paris system by the employment of trail cars. On a great many lines single trailers are used and on a number of lines operating outside the city trains of three or four cars are employed. The company has a number of double-deck cars with from 74 to 83 seats each, but they require the use of two conductors, and their use is limited to a few routes in the outskirts of the city except on special occasions, such as on Sundays and holidays during the summer season.

Daily car inspection is arranged with the idea of having at least 83 per cent of the rolling stock available at the beginning of the day, 90 per cent at 11 a.m., 94 per cent at 1 p.m., 95 per cent at 2 p.m. and the entire equipment by 4 p.m.

Adjustment of the rush-hour schedule is complicated by the agreement which the company has with its motorman and conductors. This agreement provides:

	Hours
Average working time per week	48
Maximum working time per day	9½
Maximum spread of work	13½

Meal relief times are also specified, and for the morning shift cannot be before 10:30 a.m. or after 1:30 p.m. and for the afternoon shift cannot be before 4:30 p.m. or after 8:30 p.m. A spread of 13½ hours must not be exceeded in any case.

It will be seen that these rigid regulations make economic arrangement of schedules very difficult, since the heavy traffic period continues for about fifteen hours or from 5:30 a.m. to 8:30 p.m. To help the situation the company has had recourse to the following:

Women are employed as conductors during four hours of the day; some shopmen work as motormen during part of the day; some employees in other departments do miscellaneous transportation work on part of their time; on Sundays and holidays it is quite common to transfer men from one division to another according to the extent of the traffic; men are not permitted time off on days of heavy traffic; some overtime is paid to volunteers, etc.

Of the second and third methods of coping with rush-hour traffic, listed above, means of increasing schedule speed has already been considered in this article, and short routing of cars is used to a considerable extent.

The fourth method of increasing rush-hour capacity, mentioned above, is by the use of folding seats. Several companies in Europe are using successfully seats arranged to fold and swing out of the way during the rush hours to increase the standing room and hence the carrying capacities of the cars during this period. Up to the present this plan has not been followed on the Paris system, but it offers a means of coping with the rush-hour situation. The plan seems especially adapted to prepayment lines.

The introduction of express service or direct lines was the final method suggested above for increasing rush-hour capacity. A test of this plan was made with buses in Paris recently. The buses made only a few of the stops made by the regular lines, but the experiment did not prove very satisfactory and was abandoned. One trouble was that the loads were carried in one direction only. Another was that in congested streets it was difficult for the express buses to make much better time than the local buses. The experiment showed, however, that there is a field during the peak hours for an express bus service at higher rates over the same general routes followed by the ordinary buses, provided the express buses can make considerably better time.

The Lyons Tramway & Omnibus Company has been operating some express buses of this kind at higher fares with success. It has found that on the streets where this service of buses and tramcars operates together the express bus service has speeded up all the traffic on the street and so helped the tramcars to make better time.

An Added Source of Revenue

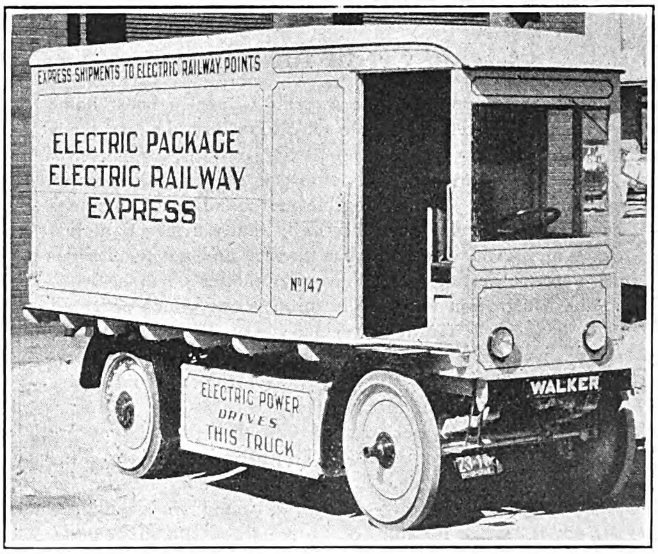
Electric Railways May Provide an Attractive Express Service in Conjunction with Their Normal Freight Movements

By F. W. Brown

Manager Electric Package Agency, Cleveland, Ohio

Methods of obtaining additional revenues for electric railways, as well as for increasing the capacity to serve, are of importance at any time, and at this time when store-door delivery is being given consideration, the subject of express shipments on electric lines naturally comes to mind. It may not be generally known that in the main express shipments are in a class by themselves and that there is no conflict between such shipments and freight. That is, shipments that are intended to move by express will so move, and as electric railways do not, except in a few instances, provide such express service, the business goes to the old line express company.

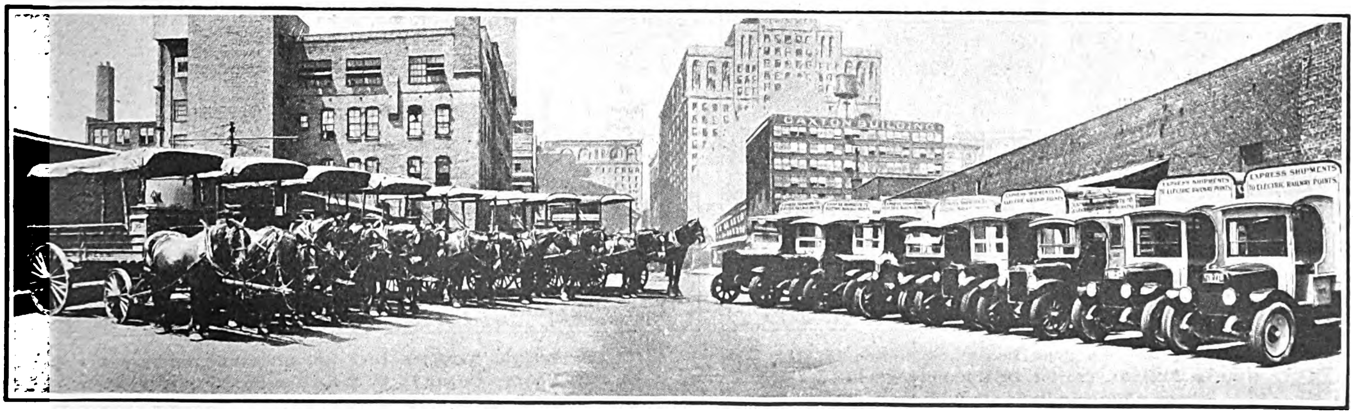
The features of express service that make it differ from freight are essentially such as to make it a preferred service, for which the shipper or consignee seems willing to pay. The pick-up and delivery does not by any means constitute the entire difference, Cash-on-delivery service, insurance for valuable merchandise, as well as less packing restrictions, all are identified with express shipments. In these days of rapid movement of freight by electric railways, the "Order Bill of Lading" is too slow and the merchandise is at its destination long before the bill of lading is at the bank. This causes confusion and dissatisfaction; while with the c.o.d. express shipment, delivery is immediate and the payment at that time closes the transaction, so far as the consignee is concerned, all at once.


EXPRESS SHIPMENTS TO ELECTRIC RAILWAY POINTS
ELECTRIC PACKAGE
ELECTRIC RAILWAY
EXPRESS
No 147
ELECTRIC POWER DRIVES THIS TRUCK
WALKER

A New Electric Truck that Has Just Been Added to the Electric Package Agency Fleet in Akron, Ohio

As stated earlier, there is enough difference in the class of shipments moving by express and by freight so that there is no conflict between the two. Shippers not providing their own trucks find but little, if any, difference in the cost by express and by freight plus drayage, with the advantage of expediting movement by express.

The Electric Package Agency, acting as agent for the Lake Shore Electric Railway, the Cleveland-Southwestern Rail & Light Company and the Northern Ohio Power & Light Company, performs an express service between all stations located on these lines and to Detroit via the Detroit United Lines and to Youngstown via the Pennsylvania-Ohio System. All the features of the express service are furnished by the Electric Package Agency, and the rates charged are the same as by the old line express company. Soliciting, advertising, auditing, filing of tariffs and investigating of claims are matters taken care of by the Electric Package Agency, as well as provision and maintenance of all street equipment and the pick-up and delivery service. The rail lines furnish the transportation between terminals in the same manner and in the same cars as they transport interline and local freight shipments. It has been found that the regular freight car movements are frequent enough so that with but one exception additional service is unnecessary.



Street Equipment Used in Cleveland, Ohio, in Making Door-to-Door Pick-Ups and Deliveries

Giving Credit for Service

IT IS the purpose of the *Buyer's Guide* to boost home business by telling people why Massillon dealers serve them best.

Sometimes, however, we overlook the fact that every merchant is not selling tangible merchandise. Sometimes he is selling service only, but he is really a merchant just the same. And when you buy service and get good service, you are getting more than your money's worth.

The illustration we have in mind is one which occurred right here in the Guide office last week. We were looking for a shipment of paper over the Electric Package Company's lines. It was an important shipment, and every minute's delay meant real money.

Meeting Paul Englehardt, 1434 Sixth Street, driver for the Electric Package, we asked him to watch for the shipment and snap it to us. Englehardt probably gets lots of rush calls, and knowing this we expected we would get our paper "when it came."

But next morning early in walks "Pauly," with his eternal beaming grin, saying, "Here's your stuff. Just came in." That little extra service on Englehardt's part saved us dollars and kept in good humor an exacting customer to whom we, in turn, were trying to give service.

That is what we mean when we say that whether a man sells merchandise, service, or both, it is a pleasure to know that "Massillon serves you best," and if Englehardt reads this, he'll know we appreciate the kind of service he sells.

—*Buyer's Guide*, Massillon, Ohio.

Quality of Service Rendered in Massillon, Ohio, by the Electric Package Agency Is Commended by the Local "Buyer's Guide"

The express shipments are loaded last in the same car with the freight or, where the volume for any one point is sufficient, the entire car is used, but such is handled in the same train with freight cars. It will be seen that this additional tonnage which cannot be secured except by furnishing the express features of the service is added at an attractive rate with little or no additional expense.

Express rates are usually three times greater than first-class freight rates. The expense of performing the pick-up and delivery and other features of the express service is approximately one-half of the gross revenue from this source, thus leaving to carriers a rate per ton well above the first-class freight rate, or double the average rate received for freight shipments handled at the same time. The volume obtainable, however, is much smaller.

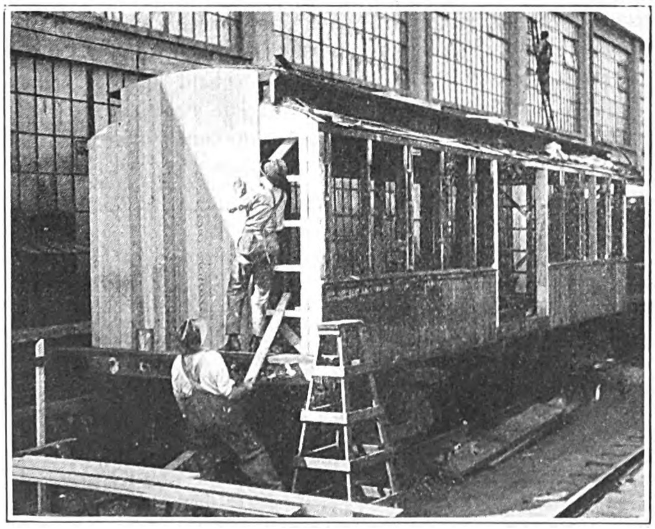
Such a service would not be profitable if performed separately; it should be in addition to service now operating. Nor can individual lines establish such a service locally; it would necessarily have to be operated separately and to include all connecting lines now operating through cars in interline freight service, its scope being to provide on electric lines the same service now provided on steam lines by the American Railway Express Company. The Electric Package Agency has performed such a service for a number of years for the lines it represents. While the territory it covers is limited, yet the gross earnings received from this source are such as to make it interesting, especially as there is but little additional cost to the carriers because of its operation.

Old Passenger Cars Rebuilt for Freight Trailers

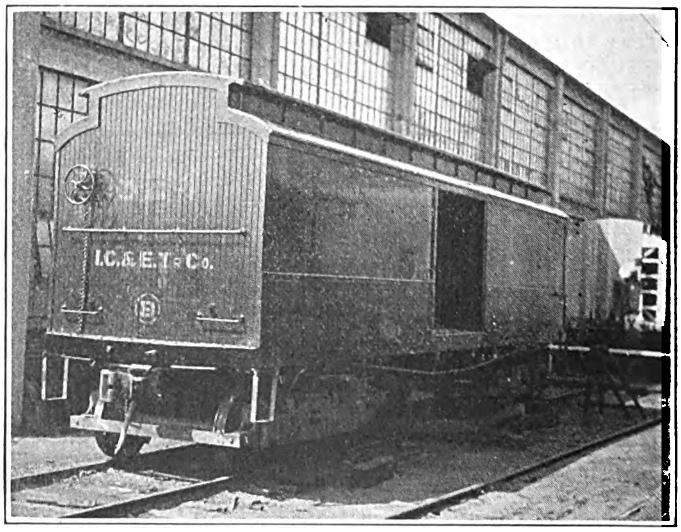
SEVERAL old wood passenger cars have recently been converted into freight trailers by the Indiana, Columbus & Eastern Traction Company at the Springfield, Ohio, shops. The views show the method of accomplishing this conversion. After the windows, seats and interior fittings have been removed the ends and sides are covered with tongued-and-grooved side sheathing, which is then painted the Pullman green used on the passenger cars of the company.

Motors, gears and control are also removed and the air brake equipment arranged for operation in train service. The hand brakes are changed as shown in the accompanying illustration of the completed car. Standard freight car door openings are cut in each side and inside hung doors mounted.

The two cars shown were completed during the summer and fall months at an average cost of $835 each. They will be put in service on the company's lines to care for its growing carload freight business.



Reconstructing an Old Type Passenger Coach for Use as a Freight Trailer in the Springfield Shops of the Indiana, Columbus & Eastern Traction Company



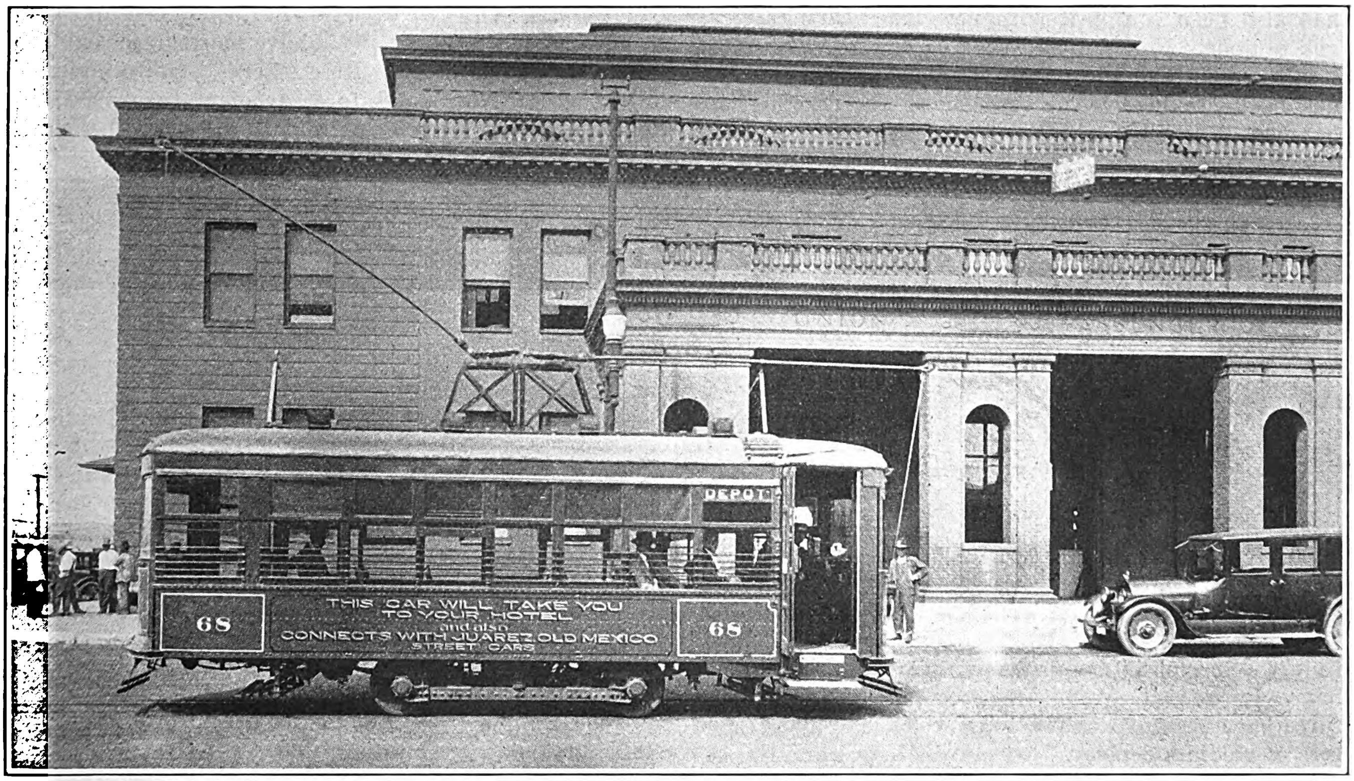
One of the Freight Trailers Just Rebuilt from a Passenger Car. A Few Years ago the I., C. & E. Purchased Several New Light-Weight Passenger Cars to Replace Old Heavy-Weight Wooden Ones

The "Texas Idea" in Street Car Publicity

El Paso Cars Are Being Dressed Up to Attract Increased Patronage — Exterior and Interior Decoration Is Part of Program—Use of "Different" Car Cards Helps Both Advertisers and Railway

By E. J. Muse

Customer Service Department, El Paso Electric Company


DEPOT
68
THIS CAR WILL TAKE YOU TO YOUR HOTEL and also CONNECTS WITH JUAREZ OLD MEXICO STREET CARS
68

Since Strangers Are Particularly Interested in Reaching a Hotel or in Seeing Juarez This Information Is Given on Car Used on Depot Run

EL PASO is now going through the throes of a "dressed-up" street car program. That's not news, because the same stunt has been worked elsewhere. But the surprise twists which have been introduced into the plan by the El Paso Electric Company lend the complexion of originality to the dressed-up street car idea as it has been worked out on the banks of the Rio Grande.

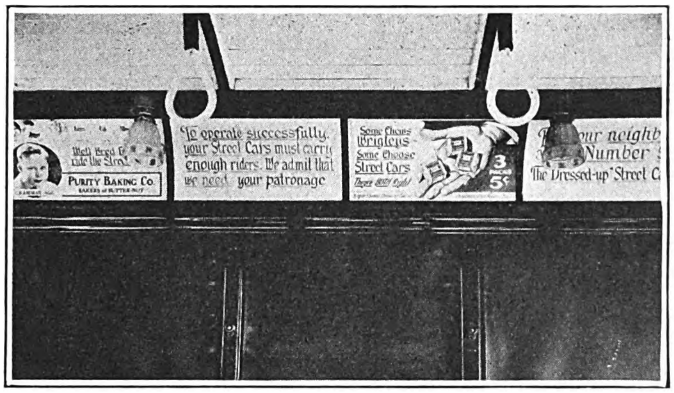
In the first place, the company did not stop at one street car in this dressing-up process, but proceeded to improve a number of them. The cars have been repainted in most attractive colors and present variegated and attention-arresting effects. As a result they have been a topic of conversation for almost the entire population of the twin cities of the border, El Paso, Tex., and Juarez, Mexico, since putting in an appearance on the various lines.

No particular color scheme or standard was followed in decorating these cars, but each one has been painted differently. Car 117 was painted chrome yellow, trimmed in Yale blue; on car 119 the colors were reversed, this being painted Yale blue and trimmed in chrome yellow. Car 68 has been given a coat of light green, trimmed with orange. Car 53 is gray with buff trimmings. There are others with still different color combinations, as variegated and attractive as the rainbow. Needless to say, these "cars that are different" produce the bright splashes of local color in the scheme of things so far as El Paso's street car traffic is concerned and have been the source of much attention from a curious and interested public.

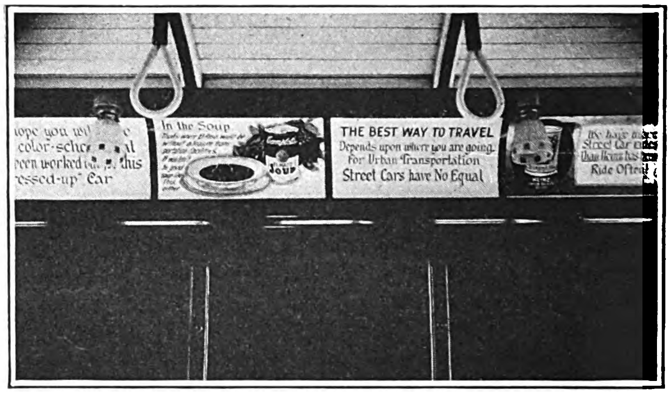
Car 68 has been regularly assigned to a run on the depot line. On this car several special features of construction have been introduced to add to the comfort and convenience of travelers. Special baggage compartments have been built into the front and rear ends of this car. These afford a convenient place for handbags and avoid the necessity for placing bags and valises in the aisles and upon the platforms of the car. The depot car makes a short loop and meets all trains.

Quite a novel feature of this depot car is to be found in the text and special arrangement of its destination signs. In addition to the regular signs, the outside panels on both sides of the car have been utilized to get the following message over to the public: "This car will take you to your hotel and also connect with Juarez, Old Mexico, street cars." The entire length of the panels has been used for this purpose and it has been found that these signs are a big help to strangers arriving in the city. Naturally the first thought of the stranger is how best to reach a hotel, or to make a trip to Juarez, the quaint old Mexican town across the river.

In the preparation of car 53, the first dressed-up street car to make its appearance on the lines, executives of the El Paso Electric Company made what might well be termed a "splurge." The car is a standard single-truck Birney car which was completely overhauled to make it more attractive, less noisy and more easy riding. The hand rails, seat handles, fare box and stanchions were given a high nickel finish and the car was equipped with sanitary porcelain hand straps. The truck and motor were completely rebuilt and everything possible tightened up, so as to eliminate vibration and reduce the noise of operation to a minimum. This car has also been equipped with new ball bearings, gears and pinions. New non-slip flooring, suitably covered to deaden sound and add to the comfort of the passengers, has been provided. The interior of the car has been finished in imitation oak with white enameled headlining. Special interior lighting features further enhance its attractive appearance. Statuary bronze fixtures have been used which have white opal glass reflectors of medium density.



Through the Courtesy of Barron G. Collier, Inc., This Tie-Up with National and Local Advertisers Was Effected



The Railway Is Also Using a Number of Special Cards of Its Own Design to Convey a Serious Message

NOVEL WAY OF UTILIZING CAR CARDS TO SERVE A DUAL PURPOSE

This car has been used by the publicity department of the El Paso Electric Company as a medium through which to put over a clever advertising stunt. Having first secured permission from Barron G. Collier, Inc., to use the advertising cards in this car, the cards were changed to include a selling message for the commodity which they are merchandising—street car rides. In every case this selling talk forms a tie-up with the regular advertising messages. All of the cards, with the original illustrations, were left intact, except that a cut-out was made on each one to accommodate the street car advertisement tying up with the message of the advertiser whose card was used. The scheme serves a dual purpose—it calls attention to the street car as a means of safe and economical transportation and, at the same time, gives an added interest to the advertisements of those who are using street car cards as a medium of publicity.

A letter was mailed to each of the local and national advertisers whose cards were used to carry out the idea, telling them of the plan, and this has resulted in still wider publicity for the scheme through various house organs and trade journals.

The idea is original with the El Paso Electric Company and so far as is known has never been tried anywhere before. The plan is especially valuable since it contains all the elements of interest—originality, novelty and humor. For instance, a Campbell's soup advertisement was changed thus: "In the soup — that's where El Paso would be without adequate transportation facilities. It wouldn't be good soup like this, either." Without spoiling the effect of the original selling message, the tie-up adds to the force of the advertisement.

On another card which has long been familiar to all street car riders this rather startling statement appears: "Some chews Wrigley's—some choose street cars. They're both right."

The sign of the 57 varieties in the dressed-up car has been changed to read: "We have more street car rides than Heinz has beans. Ride often!" In an advertisement of the National Life & Accident Insurance Company, a car card made familiar to many by the picture of the Shield Man, appeared the statement: "The street cars insure you against getting left with a flat." There is food for much serious thought in such a statement. It is another way of saying that a street car ride offers transportation insurance worthy of consideration.

There are many more of these signs, but the ones quoted should serve to give the idea. The dressed-up car has a full assortment of them, all of which have either been changed or carry a specially prepared message which is directed to patrons, appealing for more street car riders. For every card of a local or national advertiser which appears in the dressed-up street car the El Paso Electric Company has included a card of its own. These have been sandwiched in between the regular cards and contain messages written in more serious vein. These tell the story of the dressed-up car and seek, besides more rides and more revenue, to gain the public confidence and build up public good will. There are several very frank appeals for more business. On one of these cards is set forth: "To operate successfully your street cars must carry enough riders. We admit that we need your patronage."

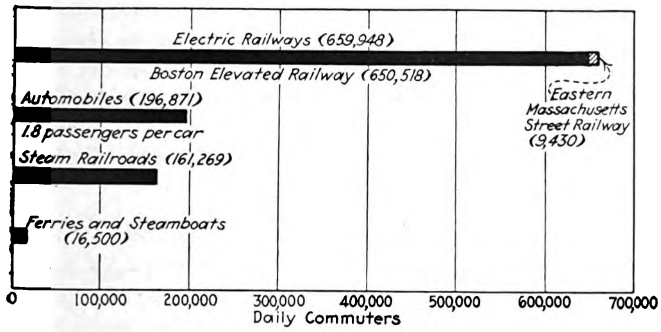
In some of the more seriously written of the cards appeals are also made to loyalty and to civic pride. For example: "The paint used on this car was purchased from the Tuttle Paint & Glass Company" and "The floor covering was purchased from the Rogers Furniture Company." Both of these are local El Paso concerns. Still another card in this group says: "This car was dressed up in our own shops. All materials that were obtainable in El Paso were purchased here."

In another group of these specially prepared car cards are some which invite confidences and opinions of the riding public. Among the number there are such appeals as the following: "We would be glad to know how you like the dressed-up street car. Write and tell us." Then there is one which reads: "All dressed up. Notice the pretty lights, nickel plating, the floor covering and other features of interest." Still another card makes this request of patrons of the line: "Tell your neighbors about No. 53, the dressed-up street car."

A card which bears a message of particular interest and one that sums up the situation pretty well is one which says: "The best way to travel depends upon where you are going. For urban transportation street cars have no equal." There the whole thing has been put in a nutshell. That is the idea behind the whole business and expresses what should be the aim of all street car advertising. The object should be to convince the entire public that it needs street cars. Not alone those who must depend upon street cars for personal transportation, but those also who own and operate private automobiles, the ones who own property, the merchant, the lawyer, the banker, the doctor—all need the street cars, whether they realize it or not. In every urban community prosperity is absolutely dependent upon the successful operation of a street railway system. This is a gospel that street railway executives and officials have been preaching for a long time, and the El Paso Electric Company seems to be successful in making believers of a majority of those who go to make up the communities which it is serving.

Boston "L" Issues New Guide Book

INFORMATION concerning car and train service of the Boston Elevated Railway, maps of the system and pictures of interesting and historic spots in and around Boston are given in a revised book just issued. The cover is a colored representation of the Park Street station and surroundings, showing Boston Common and the State House. Colored maps show the surface car lines, rapid transit lines, bus lines and foreign connecting lines. Under the head "The Elevated Carries the Commuters" a striking diagram is presented showing clearly the fundamental character of the co-ordinated transportation system in metropolitan Boston. The relation of the riding habits to transportation service is convincingly brought out. Figures are presented to show that traffic congestion can be reduced by increasing use of the Elevated lines. The booklet is compiled and distributed jointly by the Elevated and the Boston Chamber of Commerce.



Figures Show that the Boston Elevated Carries Nearly 70 Per Cent More Commuters than All Other Means of Transportation Combined

High-Speed Articulated Cars for W., B. & A.

Ten Two-Car-Body Units, Each Mounted on Three Trucks, Will Supply Limited Service Between Washington and Baltimore—Easy Riding Qualities and Superior Appointments

ORDERS for ten articulated cars have recently been placed by the Washington, Baltimore & Annapolis Electric Railroad with the J. G. Brill Company. When completed these cars will supply the half-hourly service on the 40-mile double-track main line between Baltimore and Washington. The double-car units will be mounted on three trucks and except for the rigid connection between the front and rear bodies through the agency of the articulated mounting on the middle truck the unit will be operated as one car, having, however, the passenger carrying capacity of two cars. Four motors per unit will be used, mounted two on each end truck in the standard manner. One set of control and air brake equipment will be used per unit. The cars are arranged for double-end operation, a motorman's cab being built in the right-hand section of each front vestibule.

The service between these two cities, based on studies extending over several years, is such that a two-car capacity is always required. Nearly all of the traffic handled between Washington and Baltimore is through business, since the intervening territory is sparsely settled. What local service does exist is handled on a two-hour headway by individual cars. In addition to this, the Baltimore to Annapolis trains operated via the Naval Academy Junction supply local service for the northern section of the main line.

For the through business between Washington and Baltimore, this company is in competition with the Pennsylvania and the Baltimore & Ohio Railroads and the Washington Motor Coach Company. Thus speed and comfort are essential factors. In these trains it is expected that greater riding comfort will be obtained due to the articulation, since the rigid connection reduces the tendency to side sway or to nose.

NEW ROLLING STOCK NEEDED TO INCREASE PASSENGER RIDING

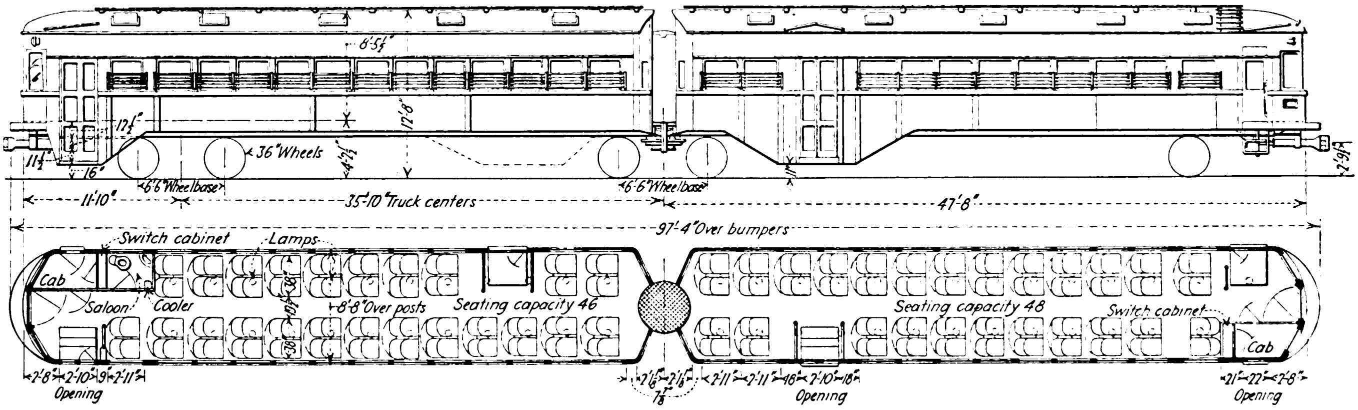
Immediately following the cessation of the World War and the gradual curtailment of governmental activities there was a very pronounced falling off in Baltimore-Washington traffic. On the other hand the business on the company's two other lines between Baltimore and Annapolis held up to a greater extent despite the increasing use of automobiles. This new equipment will be directed, therefore, at the division showing the greatest relative losses. The company has for many years enjoyed more than half of the Baltimore-Washington traffic, so that these new cars will not only tend to check losses but they will also provide an agency whereby a greater share of this very desirable business can be obtained.

At present the company operates between excellent terminals near the center of each city, and while the running time from terminal to terminal is 85 minutes, because of relatively slow operation over city streets, this differential over the steam road schedules of one hour is not so obvious when the time and money element of a taxicab or street car ride necessary to reach the steam road terminals is taken into consideration.

By this change in equipment not only modern steel equipment of more attractive design will be available but a more economical unit will thus be created. The weight saving alone, unit per unit, is nearly 30 per cent, or over 23 tons. Four motors instead of eight, one set of electrical and air brake control as against two, three trucks as against four, will all reflect savings in operating and maintenance costs.

ONE DOOR USED FOR ENTRANCE AND EXIT

The passenger carrying capacity is the same as two cars, since two car bodies are used. Due, however, to the permanent connection and the easy access between units of the articulated train, it is planned to use one door for entrance and egress to the articulated car, and the conductor will control all passenger movement from one position and handle the fare collection of the complete car. In addition to the 34-in. door openings near the middle end of each car body an end door of the same width is available for use at terminals. All doors will be pneumatically operated.



Side View and Floor Plan of One of Ten Articulated Cars Being Constructed for the Washington, Baltimore & Annapolis Electric Railroad
These cars will supply limited service over the 40-mile double-track line between Washington and Baltimore, operating on a 30-minute headway. The present wood cars, in constant service since 1910, weigh approximately 80 tons per train. The new articulated units are estimated to weigh 59½ tons.

Each car body will have a length of 47 ft. 8 in. and when mounted the articulated unit will have a total length over all of 97 ft. 4 in. The seating capacity of each half unit is nominally 48, except that space for one double seat is used for the installation of the saloon at one end of the car bodies. A flush lavatory and basin will be supplied in each saloon.

The seats will be double-rotating chairs of Hale-Kilburn manufacture. The backs will be curved, as illustrated in the diagram, and heavily padded. Seats will be constructed with individual spring cushion pads and individual arm rests at the end. Frieze plush will be used for the outer covering. Ample knee room will be available, since the seats are to be mounted on 35-in. centers, and they will thus conform to the side window spacing.

Double wood flooring will be used, the bottom to be laid lengthwise and the upper crosswise. The top floor is to be covered with a standard type of cut-out Pullman rubber tile.

Supported on steel carlins, the arch type roof will be constructed of tongued-and-grooved sheathing covered by canvas in the conventional manner.

Except for the roof and the floor, the balance of the construction will be steel. It is estimated that the weight of the complete double-body unit will be 118,950 lb. The detailed estimated weight is as given in the following table:

Weight of one complete unit, consisting of two sections, three trucks, seats and piping for electrical and air brake equipments, but less electrical equipment, control and air brake equipment	92,500 lb.
Motor equipment	15,400 lb.
Control equipment	5,850 lb.
Air brake equipment	5,200 lb.
Total weight	118,950 lb.

On each end of the double unit Tomlinson MCB radial couplers will be mounted so that two units or a four car capacity can be operated together in one train in just the same manner as are two cars at present.

The electrical equipment will consist of two Westinghouse 333-VV-8 motors per car body, or four motors per unit with double-end HL type control, arranged for operation on either 600 or 1,200 volts. Propulsion current is obtained from an overhead 1,200-volt trolley in the city of Baltimore as well as on its private right-of-way from that city to the District Line, then overhead 600-volt trolley to Fifteenth and H Streets, Washington, after which the cars are operated over the 600-volt underground conduit system of the Washington Railway & Electric Company.

BRAKING PRESSURE REGULATED BY LOAD

Westinghouse automatic and straight air brake equipment will be used. It will be designed to apply pressure to the wheels of all three trucks in proportion to the relative weight on each.

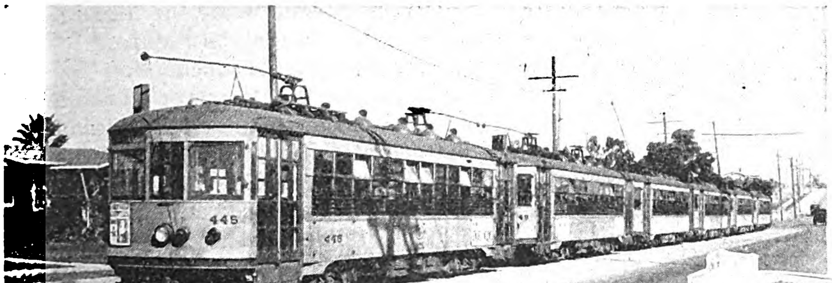
Special attention is being given to all of the interior details, such as lighting, heating and ventilating. It has been decided to use 22 double coil truss plank heaters controlled by a thermostat in each section. Both the heaters and the ventilators, ten of which will be used in each section, will be manufactured by the Railway Utility Company. The company has adopted a deep letterboard in lieu of the Gothic glass which this company had previously used and which is in keeping with the modern interurban cars. Plate glass is used in the windows and will give a pleasing outlook to the passengers.

Cab-Controlled Couplers Speed Up San Diego Service

High-Speed Multiple-Unit Trains at San Diego Demonstrate Merits of Combination Air and Electric Car Coupler in Heavy Interurban Service, Where Speed in Coupling and Uncoupling Is Essential

By R. G. Averill
Commercial Engineer Ohio Brass Company

COMPLICATED coupler problems were involved in the equipment of 50 cars purchased by the San Diego Electric Railway early in 1923 from the American Car Company of St. Louis. These cars were intended primarily for train operation and had full motor equipment with multiple-unit control, but they were also designed so that they could be operated individually, as either one-man or two-man units.



On the Interurban Line as Many as Six Cars Are Used in a Train

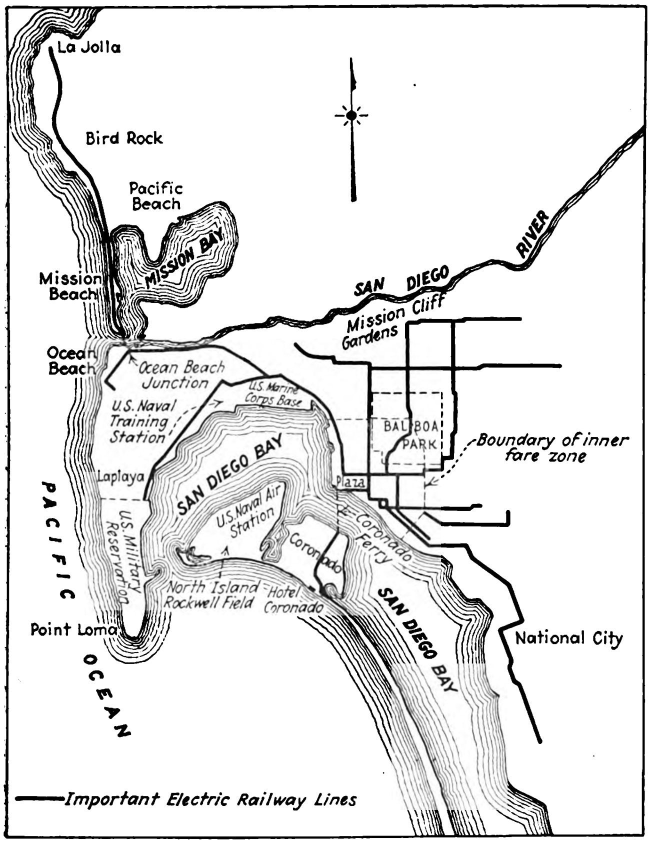
A Passenger Train at the Plaza in the Central Business District of San Diego

The train operation in which these cars are being used is on the Mission Beach and La Jolla line and on the Ocean Beach branch line. The traffic on these routes is highly fluctuating and has a pronounced seasonal variation as it is largely tourist and amusement park traffic. It was necessary, therefore, to provide peculiarly elastic trains and trains which could be coupled or uncoupled quickly en route, as these trains generally comprise a three-element unit which uncouples at two points on the outward journey and is again reassembled in a reverse manner at these same two junction points. A train of from three to six cars leaves the plaza at San Diego and runs as a unit under the control of a single motorman through the city streets, northwestward around the harbor and across the base of the Point Loma Peninsula to Ocean Beach Junction, a total distance of 6 miles, in a scheduled running time of eighteen minutes. Here the rear one-third of the train is detached, practically with no delay, to turn south to Ocean Beach, while the front section proceeds north 1 mile to the Mission Beach amusement center. Normally the leading car of the train is detached at Mission Beach and proceeds 6 miles further north to La Jolla. The total running time from San Diego to Mission Beach is 21 minutes, while to La Jolla it is 35 minutes. The return trip, of course, is simply a reversal of the evolutions described for the outward journey and all cars are again collected into a single unit for operating over the city streets. This minimizes congestion of traffic in the business center and has proved a popular as well as efficient method. From the description of this operating system it will be evident that speed in coupling and uncoupling cars, while loaded and in regular service, is an essential factor in maintaining a satisfactory schedule. These coupling and uncoupling operations not only must be done quickly but they must be casual incidents, entailing no annoyance or discomfort to passengers. At first thought these may not seem remarkable requirements, but such a conclusion is due to a failure to appreciate all the necessary operations involved in making a complete coupling between modern multiple-unit motor cars. Perhaps a tabulation of some of these requirements will prove interesting and may win for the lowly coupler some measure of the respect which its humble performance of vital functions merits:

1. Automatic mechanical coupling upon impact. The

physical connection which must withstand all tensile and compressive stresses incident to train haulage and coupling shocks. The coupler face at the ends of a car or train must be in condition (without requiring preliminary adjustment) to engage a counterpart coupler quickly and securely when the two are brought together. The coupler must be anchored securely yet flexibly to the platform underframing to provide for car haulage and still permit the necessary horizontal, vertical and torsional movements required of coupler bars on coupled cars when traversing curves and abrupt grades.

2. Manually controlled uncoupling means, whereby a trainman on either adjacent platform can quickly and safely effect an unlocking of the couplers and separation of the cars.



This Map Shows the Principal Lines of the San Diego Electric Railway

3. Automatic coupling of two air brake pipe lines upon impact.

4. Manual control equipment on each platform for positively opening valves in both air brake lines after the couplers have been engaged and for closing these valves (during the uncoupling operation) before the coupler heads can be disengaged. The movements of the valves on both platforms must be subject to the control of an operator in either car.

5. Automatic electric coupling, involving the closing upon impact of sixteen independent train line and control circuits and of a separate power bus line circuit.

6. Manual control equipment on each platform for operating, pneumatically, special drum type switches on coupled ends of cars, each switch serving to close the several circuits leading to the electric couplers subsequent to coupling, and to open them prior to uncoupling. The movements of the switches on both platforms to be subject to the control of an operator in either car.

7. The provision of a positive mechanical interlock between the electric coupler disconnecting switch and the air brake pipe valves on each platform. This prevents the switch being closed when the valves are closed, or the switch being open when the valves are open, a safety feature which insures that no "live" contact parts will be exposed on the uncoupled ends of a car or train. No car can be operated with the air valves open because such a condition automatically applies the brakes. It also safeguards train operation by insuring the necessary opening of air line valves between cars (for proper braking conditions), as otherwise no power can be supplied the cars back of the platforms where switches are open and valves closed.

8. A pneumatic interlock between the disconnecting switch engine and the uncoupling cylinder. This prevents couplers being separated until after switches have opened all electric coupler circuits and consequently prohibits any possibility of arcing at the electric coupler faces during uncoupling.

9. The provision of an electric interlock which insures the interruption of all train control and bus line current between cars upon initial movement of the uncoupling button at any station where uncoupling may be required. This is a safeguard for the disconnecting switches as otherwise they might be required to break heavy bus line currents, should uncoupling be made while the train is moving and with power on the motors.

10. A special arrangement of the circuits involved in the coupling up operations which renders them ineffective until mechanical coupling between cars has been completed. This is an important safety feature which prevents any possible opening of the air brake valves on the uncoupled ends of a car or train, more particularly while in motion. Emergency brake applications are thus prevented even should "coupling" button be pushed.

11. The provision of a concealed interlock button in the coupler control, push button box which must first be pushed in before the main coupling or uncoupling buttons can be operated. This, of course, is merely an added safeguard to prevent an inquisitive child or other unauthorized person causing an uncoupling by pushing an uncoupling button at some unoccupied cab station.

12. The provision of a coupler equipment having a practical and safe system of control which permits uncoupling of cars or train sections at full schedule speed, if desired.

Not one of these requirements is unessential to an acceptable operation of these trains. All have been achieved by simple means, without complication, and without addition to the duties of the train crew. As a matter of fact, the coupling and uncoupling operations have been greatly simplified and the attendant labor reduced. Entering between cars is no longer necessary to complete the mechanical coupling, to couple up the air hoses or to insert the end plugs of the train line and the bus line jumpers in their sockets. A motorman simply approaches the car to which he is to couple, engages the couplers, and then, without leaving his station, presses the coupling button. This energizes electro-pneumatic valves under each platform, admitting air to the disconnecting switch engines, which completes the coupling operations by closing the switches and simultaneously opening the valves in the air brake pipes. There need be no delay in service due to coupling, as cars equipped with this form of remotely controlled coupler apparatus have been coupled on the fly while running at 20 m.p.h. It is the difficulty of correctly estimating car speeds which renders this procedure hazardous, not any limitations imposed by the couplers.

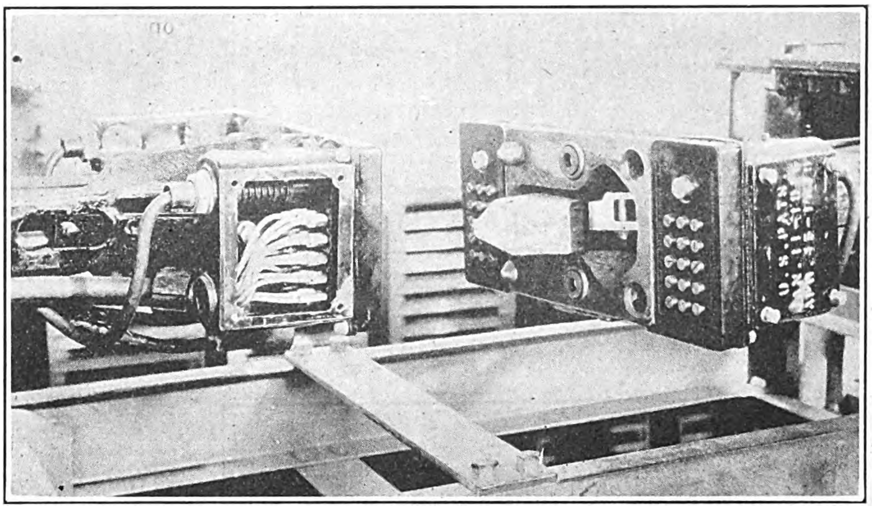
Uncoupling is equally simple and it is entirely safe, as well as possible, to uncouple while running at full speed. At the desired point, the conductor on the rear end of the forward section presses the uncoupling button, which energizes another set of magnet valves and operates the disconnecting switches on both platforms to the open position. After air valves are closed and switches are open, further travel of the switch engine piston admits air to the uncoupling cylinders and the coupler hooks disengage, allowing the cars to separate.

Never, prior to this San Diego installation, had cab-controlled coupler equipment (including bus line electric couplers) been used on a commercial scale in regular daily service. The novel character of the equipment, and more particularly its control, it was thought, justified this rather detailed description. To the more practically inclined, the convincing record of 2½ years of daily operation may prove even more interesting.

The coupler proper is of the well-known Tomlinson type, attached to the car by means of an oil-lubricated ball anchorage and supported in a special spring carrier to permit trains to travel over the abrupt Broadway grades. The electric couplers bolt to the sides of the coupler heads and thus afford maximum clearance underneath, which is important on low cars used in city service. The bus line cables (two parallel branches from the electric couplers combined into a single car cable), which terminate in the large contacts in the upper portions of the electric coupler faces, pass back through the terminal chamber entirely inclosed in insulating sleeves. Thus double current capacity is provided at the bus contacts as well as complete protection for the train line and auxiliary circuits which occupy the terminal chambers. The disconnecting switch comprises three switch boxes and a pneumatic driving engine, all coupled together as an operating unit on a common bed plate which also serves as a mounting means for attaching the switch unit to the car underframing. The two electro-pneumatic valves are mounted on a bracket under the platform near the corner of the step where they can be reached (in emergency) for manual operation of the valve stems. The push button box or operating station is located above the center window of the vestibule where it can be conveniently reached and yet where it will not attract attention or be accessible to children.

The cars equipped with these couplers are large, double-truck, double-end, city cars of arch-roof, drop-platform design. They are 47 ft. 5 in. in length over buffers with 23-ft. truck centers and weigh 48,740 lb. fully equipped. They will seat 57 passengers and have a total estimated capacity of 90. One, two and three-car trains employ one trolley pole on the front car for current collection. When more than three cars are operated as a train trolley poles are used on the first and last cars to reduce the amount of current drawn from a single trolley wheel, and also to reduce the current passing from car to car through the bus line. Heavily loaded six-car trains have been observed, however, running with only one pole up. This is good proof that generous overload capacity is afforded by the bus line couplers.

The San Diego Electric Railway uses 70 cars during the morning rush hour, 60 during the middle of the day and 92 for the evening peak from 4:20 to 5:40. Eighty-five thousand passengers per day is not an uncommon load in one of the peak tourist seasons. One of these peak seasons is in the winter, when the city has a large temporary population of Eastern visitors. The other is during summer months, when it regularly entertains a considerable number of people from Arizona and the interior valleys of southern California. During other parts of the year, however, there is a large and constantly growing traffic, because San Diego is the metropolitan center of a vast surrounding region.



A Combination Coupler Head that Is Giving Good Service Under Arduous Conditions

It should also be remembered that the city is the home port and supply base for the destroyer division of the Pacific fleet; that the chief army and navy aviation base for the Pacific Coast is at Rockwell Field, on North Island, in the harbor; that the Marine Corps base for the Pacific is here, and that the U. S. Naval Training Station as well as the U. S. Naval Hospital are permanent institutions at this port. The considerable population of these several military bases supplies an interesting and important contribution of car riders which is particularly desirable as it usually constitutes an off-peak load.

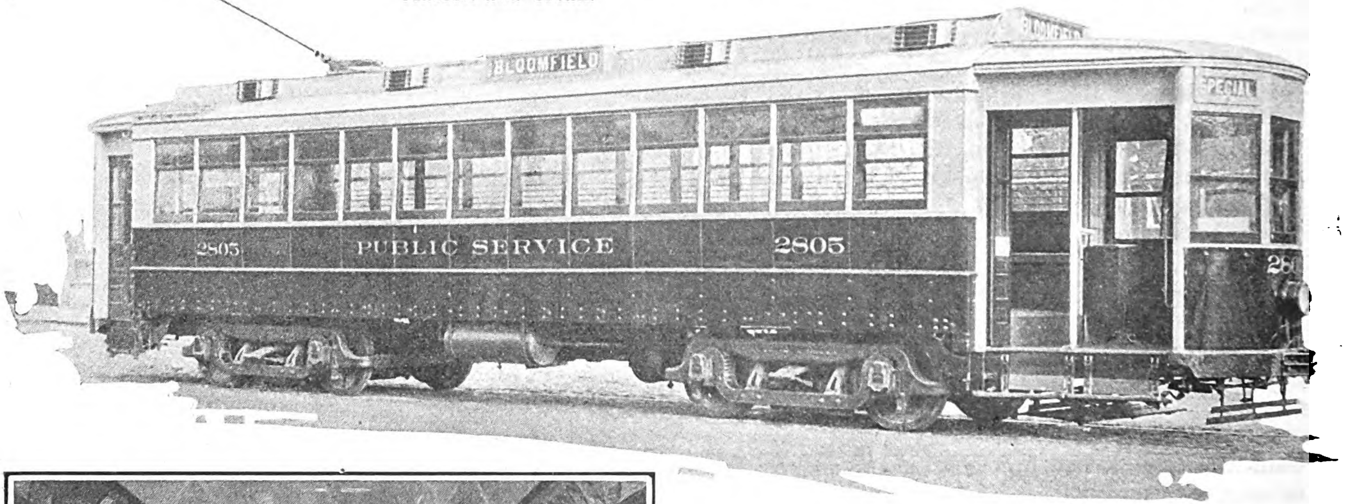
Railways in Indiana Operate 278 Buses

TRACTION companies in Indiana operate 278 buses, with a total passenger capacity of 6,447 people. These buses operate over routes traversing 1,093 miles. Of this mileage, only 62.6 is over city streets as auxiliary service to the street car lines. The rest of the mileage is over country roads between cities. The fares are fairly well standardized, ranging between 7 and 10 cents, excepting in two cases where rides are sold for 5 cents, and intercity charges averaging from 3 to 4 cents a mile. Six of the companies accept passengers willing to stand if all seats are occupied, but two others accept passengers only up to the seating capacity.

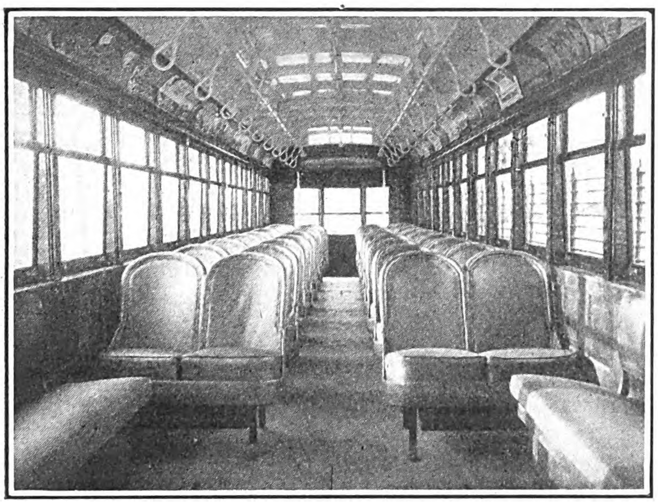
Bucket Seats Prove Popular

Public Service Railway Has Converted Latest City Car to Semi-de Luxe Type—New Exterior Color Scheme Permits Easy Identification

IMMEDIATE popular approval marked the introduction of a semi-de luxe car on the Bloomfield line of the Public Service Railway, Newark, N. J. For this service one of the latest city cars was completely renovated and repainted. Leather-covered individual bucket seats have replaced the old longitudinal cane-upholstered seats and the floor has been covered with linoleum.



The New Color Scheme Adopted by Public Service Railway to Distinguish Its Semi-de Luxe Cars Is Maroon and Cream



Double Bucket Seats Upholstered in Leather Have Replaced Longitudinal Cane-Upholstered Seats in This Car, with Which the Public Service Railway Is Trying to Attract Traffic from the Private Automobiles

Reconstruction was planned with the idea that the man who now drives his own automobile can be induced to ride the street cars if he is assured of the same degree of comfort as that to which he is accustomed. It is the hope of the operating officials of the railway that the remodeled car will prove sufficiently attractive in comfort and appearance to popularize the service and thus attract many new patrons who heretofore have used their own private transportation.

On each side are ten double bucket seats. A well about 12 ft. long is created at the front of the car by side seats holding six passengers each. The total seating capacity is 52. Spring hand straps of the type frequently found in rapid transit cars are provided on both sides of the car.

Side walls from the floor to the windows are paneled, the upper part being painted in imitation of hard wood. Iron and wood work in the car and on the front and rear platforms is painted a mottled brown and tan. The roof is painted white.

Outside the cars are easily distinguishable from the ordinary cars by the color scheme. Public Service yellow on the body has given way to a dark maroon, which rises to the window sills. Above that line a cream color is used. Gold lettering on the maroon side gives a pleasing effect. The new car is being operated in regular service at the usual fare. In addition to the one car already completed, ten others are being rebuilt in the same way.

Decreasing Congestion Losses

Dr. McClintock in Survey of Street Traffic in Chicago Discloses Many Interesting Facts—Improvements Are Suggested in Traffic Survey

A YEARLY saving of $27,000,000 can be made by a reduction of only 10 per cent in the delays affecting various types of traffic in Chicago. This is the extent of the economic burden that follows in the wake of traffic regulation, it is pointed out in one phase of the Albert Russel Erskine bureau's findings in that city alone. Experience with certain types of regulation in Chicago and other cities has demonstrated, the bureau points out, that where proper methods of control are applied the speed and volume of traffic flow can be increased from 25 to as much as 50 per cent.

The Erskine bureau, established in Harvard University for engineering research in street traffic, has completed in Chicago a twelve months survey that is one of the first scientific approaches to the solution of traffic problems confronting every American city. Undertaken at the request of the Chicago Association of Commerce and the City Council, the survey was in charge of Dr. Miller McClintock, director of the Erskine bureau, in co-operation with a committee of 80 prominent business men and city executives. An abstract of the Chicago survey appeared in the Jan. 8, 1927, issue of the JOURNAL.

"From the standpoint of movement of vehicles it is not an exaggeration to say that there are few cities in the United States that use even the most congested streets to more than 75 per cent of their capacity," declares Dr. McClintock. "The system of traffic control put into effect in Los Angeles increased the volume of traffic flow on the congested arteries more than 50 per cent and reduced expense and fatalities by more than 30 per cent. I know that by one move in Chicago it will be possible to reduce the number of trucks used in the delivery of merchandise and freight in the central part of the city by approximately 35 per cent."

Studies made by the Erskine bureau have brought out the fact that street transport plays a substantial part in the cost of living in every large city. Taking oranges, coal and potatoes as three staple commodities, it was found that drayage costs in the city, borne by retailer and consumer, ran from 25 to 50 per cent of the total freight rate from the original point of shipment.

Chicago's principal coal supply is in Illinois fields. Freight rates to Chicago are from $1.25 to $1.95 per ton. The consumer pays approximately 90 cents a ton in addition to the freight rate to cover the cost of trucking the coal from freight car to his coal bin.

Street accidents and fatalities add $600,000,000 to the national economic loss that can be reduced by modern traffic control, according to estimates of the National Conference on Street and Highway Safety.

Street congestion exacts a heavy toll from retail business establishments as well as adding to the cost of retail distribution, the Chicago survey has disclosed. Studies made in outlying business districts as well as in the central Loop area warrant the conclusion that where congestion occurs and interference results the volume of business has been reduced from 1 per cent to 20 per cent below that which would have been transacted with the automobile as a "business bringer" minus the factor of congestion.

Reports from other cities, supplementing the survey, indicate that a high percentage of all retail establishments in outlying shopping districts find that traffic congestion interferes in varying degrees with their volume of business. Information gathered by the Domestic Commerce Division of the United States Department of Commerce shows that in cities of more than 200,000 population 61 per cent of the retail establishments are affected by street congestion, 53.6 per cent in cities between 50,000 and 200,000 population, 46.5 per cent in cities between 10,000 and 50,000 and 32.9 per cent in cities from 2,500 to 10,000 population.

"From the standpoint of efficiency, and hence lower business cost, the problem of street use is the joint problem of merchandisers in the central district, merchandisers in the outlying districts and the purchasing public," declares Dr. McClintock.

Open Secrets of Operation in St. Louis

SOME of the many interesting activities going on continually behind the scenes in the operation of the United Railways, St. Louis, Mo., have been told in a 32-page pamphlet called "When St. Louis Moves." By means of interesting text and appealing illustrations, the peruser of this book sees St. Louis in the days of its cable cars and crinoline and follows its history up to the Twentieth Century de luxe cars and buses. Letting the patrons in on the daily and hourly doings of the railway system was decided upon as an antidote for the taking-for-granted attitude of many of the wonders of our daily life. The pamphlet was issued also as an invitation to the public to visit the shops and yards and note the operation of the various departments. Readers are assured that experienced members of "the army that never parades" will direct the curious ones.

The Readers' Forum

Further Comment on Chicago Bus Proposal

CHICAGO SURFACE LINES
CHICAGO, Jan. 12, 1927.

To the Editor:

The ELECTRIC RAILWAY JOURNAL deserves the highest commendation for the clarity and intelligence with which, in its issue of Jan. 1, it discusses editorially the bus proposal in Chicago.

As you so forcefully point out in this editorial, every authority on local transportation in the United States recognizes that the bus has an important function in supplementing electric railways, but when bus interests attempt to mislead the public into believing that satisfactory service in large cities can be given by buses alone they are injuring their own cause.

In consistently advocating co-ordination of rapid transit, surface and bus service the JOURNAL voices the best judgment and experience of the industry. Proposals to substitute buses for street cars in city-wide operation becloud the issue with false propaganda and are certain to be harmful to all concerned. G. A. RICHARDSON,

Vice-President.

MILLER-SCHORN RAPID TRANSIT SYSTEM
DETROIT, MICH., Jan. 11, 1927.

To the Editor:

We note the space which you have given Mr. Ritchie's views on the use of the motor bus in your issue of Jan. 1. The motor bus has a place in transportation, but it has certainly not yet been developed to a point where it can handle passengers as economically of space as do trolley cars.

While the per passenger street space of a double-deck bus may be calculated as less than that of a street car, the fact that it is not on a fixed right-of-way inclines the driver to pass from lane to lane in the street with a consequent greater actual use of the surface than does the trolley car and, moreover, this same facility makes it increasingly difficult for the other traffic on the street to gage their relative positions.

The bus has been advancing greatly in the past two or three years as to design and comfort, but in our opinion the most economical plan for handling and expediting mass transportation is the use of the trolley car for express purposes and the motor coach operating along the curb for local transportation on main arteries. The flexibility of the bus also makes it a very desirable vehicle for use in newer territory, the exact development of which is undetermined, and where transportation facilities, even at a higher base fare, are required.

We feel that your editorial has a common-sense ring that will strike a high average accord

NICH. J. SCHORN.

Maintenance Notes

Commutator Slotting Saw Operated by Air Drill

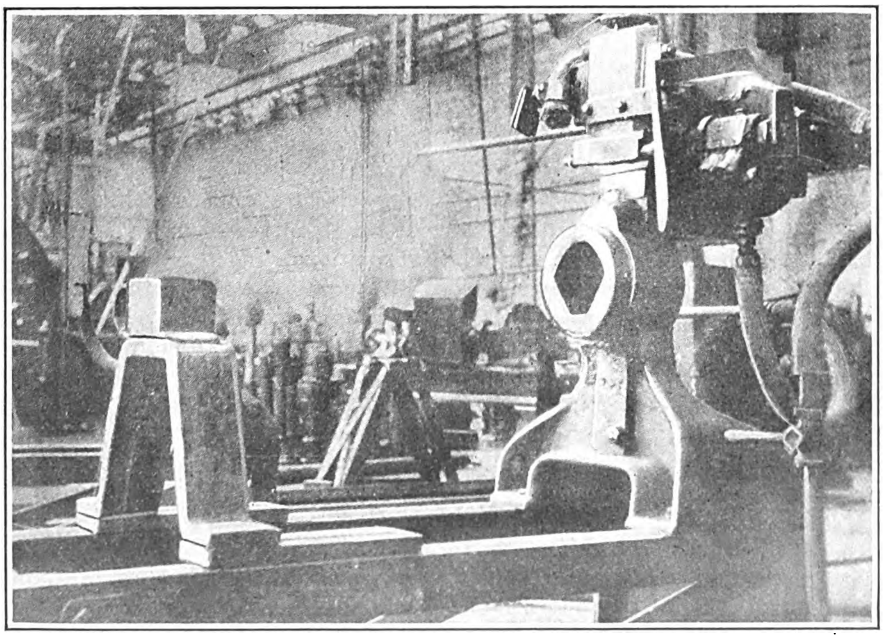
AN IMPROVISED commutator slotting machine for emergency use has been made up from an air-operated hand drill in the Interborough Rapid Transit Company's shop.

This slotting machine consists of a sturdy base upon which are mounted a stationary and a movable bearing for the support and the rotation of the armature. On top of the stationary bearing is mounted the slotting mechanism, consisting of a sliding base for horizontal motion, a slide for vertical motion and a hand air drilling machine with extended shaft and saw.

The air machine is securely fastened to the vertical slide and the saw shaft kept in alignment by a suitable bearing. A fiber shield is installed between the air machine and the saw to prevent the exhaust air from scattering the copper and mica dust. Directly over the saw is a suction hose to carry away copper and mica dust as it is developed during the slotting process.

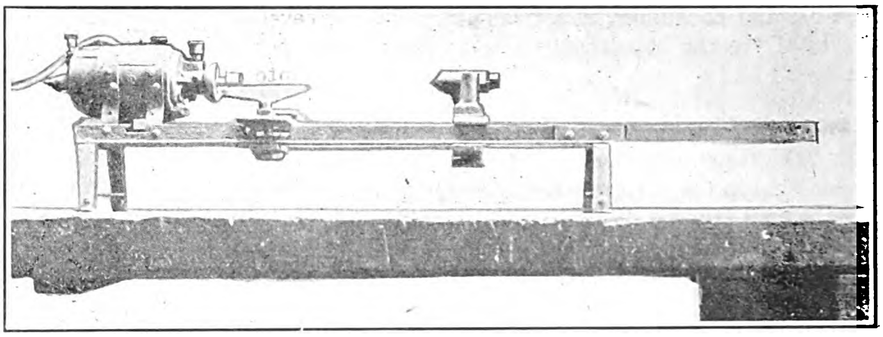
The depth of the slot is governed by the vertical slide, which is controlled by the hand wheel at the top. The movement of the saw through the slot is controlled by the horizontal sliding base hand lever shown in the illustration directly under the suction hose.

This machine has proved satisfactory for emergency use when for any reason the regular belt-driven slotters become inoperative.



Commutator Slotter Rigged Up from an Air-Operated Hand Drill for Emergency Use in Interborough Shop

Portable Lathe Efficient for Small Work



Portable Lathe Using Electric Drilling Machine as Source of Power

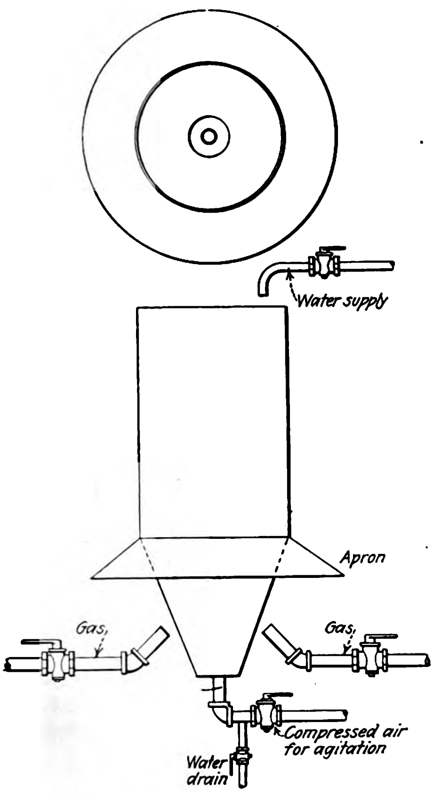
SMALL and light turning, grinding and polishing work is being done by the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., on a portable lathe developed in the shop. This lathe consists of an electric drilling machine mounted on a 1¼-in. T-iron framework, together with an adjustable centering stand and tool rest. The drilling machine is provided with suitable chucks and centers for both steel and wood work and is rigidly bolted to the T-iron frame. The centering stand and tool rest move on top of the T-iron and are held rigid when desired by means of ½-in. machine bolts and wing nuts.

Due to its portability this small lathe has been found very useful throughout various parts of the shop and has eliminated the necessity of interfering with the production of larger lathes.

Rags and Waste Reclaimed for Shop Use

RAGS and waste used for hand cleaning purposes were always a rather large item in the annual shop budget of the Reading Transit Company, Reading, Pa., until H. E. Aldrich, master mechanic, devised a simple machine for reclaiming them. This material, heretofore refuse, is now deposited in an 18-in. x 18-in. x 36-in. galvanized iron tank, where it is boiled thoroughly in an Oakite solution. The cloths are then dried and returned to the stockroom for further use. This tank is located conveniently in the shop and is provided with gas and water supply, compressed air connection for agitation purposes and a suitable apron for

One of the "Follies of 1927" in railway manipulation,
Operation without full co-operation of your organization.



Cleaning Tank and Relative Location of Auxiliary Apparatus

confining the heat from the gas flame.

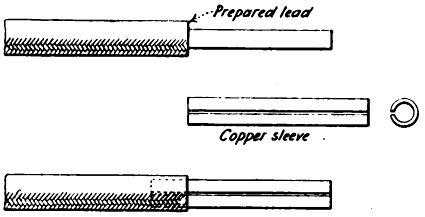
Since this shop - manufactured washing machine was put in operation the depositing of oil-soaked and greasy hand-wiping material in variout nooks and corners has ceased, with the result that the floors and pits present a very neat and clean appearance at all times.

Preventing Breakage of Leads at Ends of Sleeves

Where copper sleeves are installed over stranded leads the most frequent place of breakage is at the inside end of the sleeve where this adjoins the insulation of the cable. To overcome this trouble it is the practice of the Brooklyn-Manhattan Transit Corporation to shove the inside end of the sleeve back under the rubber insulation of the conductor so that sharp bending at the end of the sleeve will not occur. This has effectively reduced trouble from breakage of leads at the end of the sleeve.

An accompanying illustration shows the method used. In the top illustration a motor lead is shown ready to receive a soft copper sleeve. The center illustration shows the type of sleeve used and the bottom illustration shows the sleeve as applied to the cable. The sleeve is shoved back under the rubber insulation so as to bring the end of the sleeve flush with the end of the conductor. This requires a sleeve length somewhat longer than the bared end of the cable.

The sleeves are tinned by dipping them into a resin-alcohol solution and then into hot solder. They are then slipped onto the conductor and the end of the lead insulation is wet with water to prevent its catching fire when the sleeve lead is held in the hot solder. While the solder is working through the sleeve and strands of the conductor the rubber lining of the insulation is being softened by the heat. As soon as the rubber is soft enough the gloved hands of the workman can press the end of the sleeve against the side of the work table and so push the sleeve back under the rubber into position. Cooling then holds the sleeve firmly in position.



Method of Installing a Copper Sleeve Under Insulation, as a Protective Feature Against Breaking of Leads

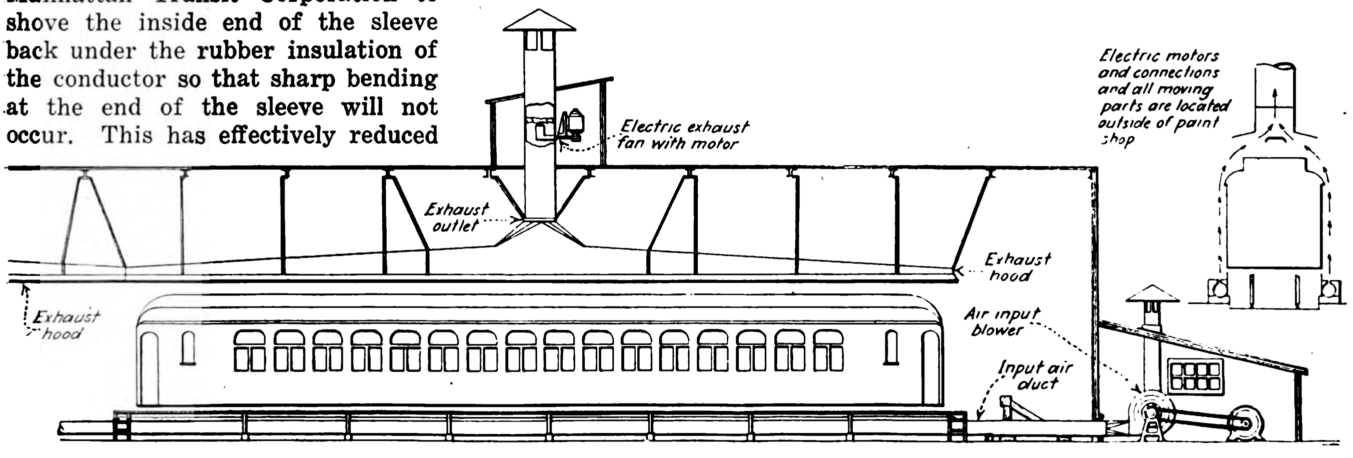
New Equipment Available

Exhaust System for Spray Painting

Provision for complete and safe removal of vapors due to spray painting without creating a draft in the shop or lowering the temperature is the salient feature of a special exhaust system for electric car and bus painting introduced by the DeVilbiss Company, Toledo, Ohio. With this system installed, it is claimed that lacquers and other spray materials can be used on any class of work with safety and satisfaction, and that the problem of gases is solved.

The accompanying illustration shows how the system is installed. It can be adapted to varying shop arrangements, according to conditions. Air ducts are included on either side of the track where car painting is done and a large exhaust hood is placed overhead. Air is supplied to the input duct from a blower, and a current of air rises alongside the car by passing from openings in the duct to the exhaust outlet overhead. The circulation of air is accelerated by having an exhaust fan in the outlet.

In operation the air current moving upward alongside the car carries off all gases and vapors without danger of their spreading throughout the shop. The upward current of air does not produce any serious deflection of the vapor from the spray gun, but removes the vapors completely and carries them up and out of the building. With this arrangement only the air which comes from the input air duct is removed from the room and no dust is brought in from outside. Electric motor fans and connections are installed outside the room.

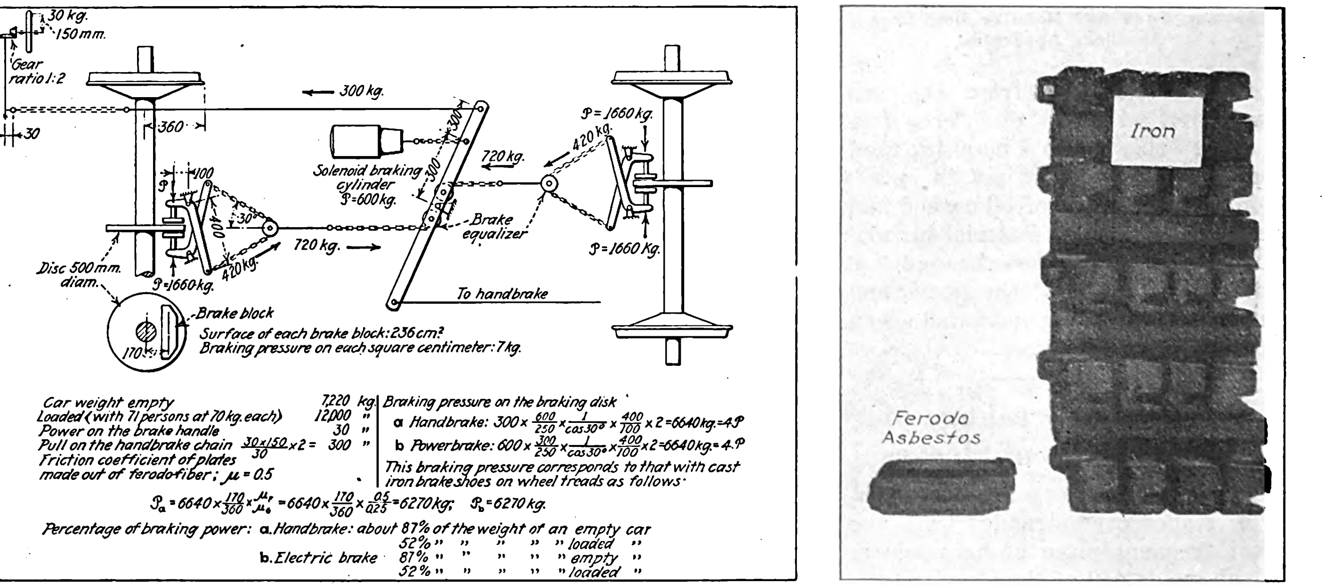

Electric exhaust fan with motor
Electric motors and connections and all moving parts are located outside of paint shop
Exhaust outlet
Exhaust hood
Exhaust hood
Air input blower
Input air duct

Special Car Painting Exhaust System

Axle Brakes and Heaters in Latest Berlin Cars

During the fall of 1926 the Berlin Street Railway put into operation 300 new trailers almost identical in exterior appearance to the 500 trailers of the 1924 series. In the new cars, however, a modification has been made in the brake, which now operates by pressure on each side of a disk on the axle by "plier" action, instead of on the inside of two disks by toggle action.

The chart indicates that the braking arrangement is very similar to that of the toggle joint and double disk arrangement, shown in the article in this paper for Feb. 13, 1926, except that pressure is applied on both sides of the disk and the area of contact distances is much less. Experience with the earlier brake showed that the wear on the brake blocks was much less than when wheel brakes were used, and one of the accompanying illustrations shows a year's consumption in the new type of brake blocks and in the wheel brake shoes formerly employed. This means, of course, a saving not only in material consumed but in time of changing brake shoes.


30 kg.
150 mm.
Gear ratio 1:2
30
360
300 kg.
300
300
Solenoid braking cylinder P=600 kg.
720 kg.
420 kg.
P=1660 kg.
100
P
400
30°
720 kg.
Brake equalizer
P=1660 Kg.
Disc 500 mm. diam.
P=1660 kg.
420 kg.
To handbrake
Brake block
170
Surface of each brake block: 236 cm²
Braking pressure on each square centimeter: 7 kg.
Car weight empty 7,220 kg.
Loaded (with 71 persons at 70 kg. each) 12,000 "
Power on the brake handle 30 "
Pull on the handbrake chain 30×150/30 ×2 = 300 "
Friction coefficient of plates made out of ferodo-fiber; μ = 0.5
Braking pressure on the braking disk
a Handbrake: 300 × 600/250 × 1/cos 30° × 400/100 × 2 = 6640 kg. = 4P
b Powerbrake: 600 × 300/250 × 1/cos 30° × 400/100 × 2 = 6640 kg. = 4P
This braking pressure corresponds to that with cast iron brake shoes on wheel treads as follows:
Pa = 6640 × 170/360 × μr/μe = 6640 × 170/360 × 0.5/0.25 = 6270 kg.; Pb = 6270 kg.
Percentage of braking power: a. Handbrake: about 87% of the weight of an empty car
52% " " " " loaded "
b. Electric brake 87% " " " " empty "
52% " " " " loaded "
Iron
Ferodo Asbestos

At Left, Chart Showing Latest Type of Trailer Brake in Berlin. At the Right Is Shown the Difference in Brake Shoe Consumption, Per Car Per Year, with the Ferodo-Asbestos Shoes Used with the Disk Brake and Iron Shoes Used with a Wheel Brake

The car framing is of steel in standard structural Z, T and U shapes, riveted together with gusset plates. To avoid rust, all steel parts before being joined are thoroughly cleaned with a sand blast and are immediately dipped thereafter in a rust-protective liquid, like Subox. After completion of the car assembly the steel structures are once more painted, and where two steel surfaces lie against each other they receive a thick coating of white lead to fill out all crevices and keep out dampness. The finished car has a pleasing effect, being finished with stream lines.

> *Meet your schedules by better maintenance and keep your patrons from contracting the "hoof and mouth" disease.*

Those parts which are liable to frequent damage, such as car posts, side posts and side panels, are constructed so they can easily be replaced. Sections of the roof also can be replaced.

Silumin, a light metal alloy, is used for the seat frames. Light metal is also used for the step and door frame.

The roof is covered with Triolin. The same material is used within the car where the parts are liable to be kicked by the shoes of passengers, and as a floor covering instead of the customary wooden slats because it permits more thorough and easier cleaning. During rainy and snowy weather sawdust is scattered on the floor to absorb the moisture.

The car journals have roller bearings, as with the last lot of 1,000 cars purchased.

Motor cars on the railway system are heated, in part, by the current from the motors used in electrical braking and by the current which would otherwise be wasted in the starting resistances. The starting resistances in Berlin are carried on the car roof, and a set of electrical heaters within the car is arranged in parallel with a portion of these starting resistances so that either circuit can be thrown in and out by a changeover switch, without changing the ohmic resistance of the starting circuit. The position of this switch on the car is set at the power house by the engineering department and the transportation employees on the car are not allowed to move it.

MAIN DIMENSIONS 1925 MODEL, BERLIN TRAIL CARS

Length of car over buffers	10.46 m. or 34 ft. 4 in.
Length of car body	6.12 m. or 20 ft. 11 in.
Length of each platform	1.94 m. or 6 ft. 4 in.
Total height	3.22 m. or 10 ft. 6 in.
Wheelbase	3.20 m. or 10 ft. 5 ft.
Wheel diameter	720 mm. or 28 in.
Height of floor above pavement	775 mm. or 30½ in.
Number of steps	3 or 3
Weight of car empty	7.9 t. or 17,380 lb.
Weight of car loaded	12.8 t. or 28,160 lb.
Weight of each axle without journal boxes	0.5 t. or 1,100 lb.
Width of end exit door	800 mm. or 31½ in.
Width of end entrance	720 mm. or 28 in.

CAPACITY IN PASSENGERS

Seats	24
Standing room within car	17
Standing room on front platform	15
Standing room on rear platform	14
Total carrying capacity	70

DIMENSIONS OF CROSS SEATS

Width of each seat	492 mm. or 19½ in.
Depth of each seat	450 mm. or 17¾ in.
Spacing of seats	518 mm. or 20½ in.
Height of seat above floor	480 mm. or 19 in.

All car heaters are made of helical coils of resistance wire supported on porcelain cores, and the iron casings in which they are contained are lined with asbestos and grounded.

The number of heaters required per car is empirically determined so that an average temperature of about 10 deg. C. (18 deg. F.) over the outside temperature will be maintained.

Trail cars are not heated by this method but from the overhead system. In the trail car heater circuits a 220-volt lamp is put in shunt with part of the heaters, but only so that about 170 volts are on the lamp. This lamp acts as a visual signal to show whether the heaters are in circuit.

Association News & Discussions

Popularizing Electric Railway Service in Pittsburgh*

By J. B. Donley
Director of Public Relations
Pittsburgh Railways, Pittsburgh, Pa.

When the properties constituting the Pittsburgh Railways were returned to the owners following a receivership that had lasted from 1918 to 1924, it was realized that the public would expect greater service in schedules, comforts and convenience at once. To fulfill this expectancy the management acted to the limit of its capacity. By constantly improving the comfort of the cars, increasing transfer privileges and bettering the schedules, the company might eventually have reached success, but this alone would have taken such a long time as to be disastrous to the company. It was necessary to "sell" the company to the public at once. To accomplish this it was decided to resort to an experiment that was considered as daring as it was novel. We called it "broadcasting our accomplishments." It was not empty ballyhoo, for the company did have accomplishments to broadcast.

Orders were immediately placed for 225 new cars, this number being later increased to 378, the total expenditure being more than $3,000,000. Additional privileges that liberalized transfer use were affixed. Fares on fourteen of the shorter routes were dropped from three rides for a quarter to 5 cents. Nine district administration buildings were constructed and furnished at a cost of more than $70,000 each. These buildings contain assembly halls which may be used for entertainment and dancing. They are free to employees, civic organizations, and to the public generally. Since 1924, nearly 100 miles of track has been reconstructed, costing about $4,000,000.

Our outlets to give publicity to these improvements were many, although the medium of the newspapers was probably used most. On small signs, larger signs and large posters hundreds of messages have been put before the riding public since 1924. Subjects treated include car service, car equipment, information regarding places to visit, and Pittsburgh's great industrial activities. Announcements notified passengers that heat or lights would be turned on when requested, indicated where lost articles might be inquired for, and gave other information that indicated the company's interest in the public welfare.

Booklets have been published for out-of-town visitors regarding the various routes and their destinations. Pamphlets for distribution among civic organizations, outdoor advertising and window displays are other methods used. One of the largest factors in acquainting the public with the problems concerning the railways, as well as advertising the service, has been through addresses by the various officers appearing at every opportunity before clubs and community organizations throughout the Pittsburgh district.

We have reasons for thinking that we have not done our broadcasting in vain. The public in general has taken a great interest in what we are doing, and by its co-operative attitude is making it possible for us to do more. The traffic division of the Police Department, realizing that the public represented by the car rider is greatly affected by its activities, has done its utmost to facilitate the operation of cars. The traffic division heads are doing everything possible to improve conditions for the 80 per cent of the passenger traffic in and out of the downtown business district handled by the street cars. Fire chiefs have acted with full co-operation to relieve car riders from unnecessary delays by removing hose from car tracks when not actually in use.

COMING MEETINGS
OF
Electric Railway and Allied Associations

Jan. 25—New York Electric Railway Association, winter meeting. Hotel Commodore, New York City.

Jan. 26-28—Association of Equipment Men — Southern Properties, Peabody Hotel, Memphis, Tenn.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Feb. 7-10—American Institute of Electrical Engineers, annual convention. Engineering Societies Building, New York City.

Feb. 10—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

Oct. 3-7, 1927—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

Measuring the Accomplishments

As we saw it, the big job was to get the public to realize the value of the street railway to the community and to make the facility more useful and more appreciated. That this has been accomplished may be realized by comparison with the figures of last year and of the last year of the receivership, 1923.

In 1923, 330,000,000 rides were taken by the street car patrons of the Pittsburgh district. In 1926, more than 400,000,000 rides were taken. To carry these 70,000,000 additional passengers it has been necessary to operate 1,500,000 more car-miles in 1926 than in 1923. However, the most significant point is that for these 70,000,000 more rides in 1926 the passengers paid $800,000 less money. This is a practical demonstration of what it has meant to increase the usefulness of a public utility and at the same time decrease fares.

The average car ride in the Pittsburgh district for 1926 cost 5.35 cents, while in 1923 it was 7.6 cents. At first glance, this would seem to indicate that the Pittsburgh Railways is playing a losing game, but along with the policy of increased usefulness at decreased fares, there has also been the policy of increased economy and elimination of waste. Through the efforts of the trainmen, shopmen and other workers a reduction of costs has resulted despite the large number of additional miles operated.

The greatest contributing agency to reduced rates, however, has been the weekly pass. This pass permits patrons to ride an unlimited number of times on all cars within the first fare zone for $1.50 each week. Its main features for gaining popularity are its transferability and its elimination of the bother of buying car checks, asking for transfers, and making change. Its sales have grown steadily from a start of about 35,000 in June, 1925, until now they have mounted to more than 60,000 each week. In practical "popularizing" of the street cars, I think that this weekly pass deserves more credit than any other single factor.

In spite of all that has been done in the past three years, however, the greatest problem still lies unsolved; that of filling the empty seats in the cars, and utilizing the empty cars that are stored in carhouses during off-peak hours. If more money could be secured from additional traffic to justify additional operations, these operations in turn would develop traffic through greater frequency of service. It is in the solving of this problem that ultimate welding of the good will of the public will be accomplished by the railway management, and the greatest opportunity to gain this end lies in the achievement of a maximum usefulness of the properties.

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*Abstract of a paper presented before the Midwest Electric Railway Association, Tulsa, Okla., Jan. 7, 1927.

After all, understanding on the part of the patrons, public officials and railway workers means everything. We might adjust fares to a scientific nicety or build a car which is more economical, efficient and comfortable than any ever designed, but unless we understand each other enough to work shoulder to shoulder, unless we of the railways can convince the public of our sincerity and honesty of purpose, then all the efficiency in the world will not secure for us the friendly public relations which we desire, and which we must have if we are to go forward instead of backward.

Motor Vehicles Feed Rails, World Congress Is Told

GROWTH of the automotive industry, its problems, and its relation to electric railways, steam railroads and waterways was the subject of discussion at the third World Motor Transport Congress held in New York, Jan. 10-11, under the auspices of the National Automobile Chamber of Commerce. More than 400 delegates from 52 countries attended.

Thomas H. MacDonald, chief of the United States bureau of public roads, told of the service rendered by motor transportation in feeding the rail lines of the country. "Out of 125,000 communities in the United States," he said, "some 45,000 are still actually not on rail lines, but motor transportation has placed them in direct touch with these. Thus motor transportation has not only linked together all the communities of this country but it has made immediately available to one-third of them rail transportation that they had never enjoyed before."

J. Walter Drake, Assistant Secretary of Commerce, declared that motor transport "by linking remote communities with rail lines had enormously increased the business of both electric and steam railways." Much the same idea was voiced by Cyrus McCormick, Jr., vice-president International Harvester Company, who declared that rail and motor transport were "complementary methods of transportation rather than competitive."

Co-ordination of facilities as a means of solving the city traffic problem was urged by John A. Ritchie, president Yellow Truck & Coach Manufacturing Company, in a speech prepared by him and read in his absence by Frederick T. Wood, president Fifth Avenue Coach Company, New York. "In the study of traffic problems," he said, "nothing has impressed me so greatly as the extraordinary complexity of interests involved." All of these, he declared, must be co-ordinated in unselfish co-operative effort, or there can be no solution. Fact-finding bodies must first be appointed, he said, to approach the problem without political prejudice and their work should not be allowed to become weakened by consideration of suggestions entirely experimental in their nature.

Traffic congestion is being held responsible by some automotive manufacturers for a noticeable falling off in private automobile sales in certain cities, according to R. H. Grant, vice-president Chevrolet Motor Company, who presided at one session and furnished introductory remarks preceding Mr. Ritchie's paper.

Entertainment at C.E.R.A. Meeting—Constitution Changes

PLANS for entertainment at the winter meeting of the Central Electric Railway Association, which will be held at the Commodore Perry Hotel, Toledo, Ohio, have been announced by James H. Drew, chairman hotel and arrangements committee.

On Thursday, Feb. 5, there will be a sightseeing bus trip for the ladies, starting from the hotel at 10:30 a.m. After luncheon there will be a matinee at one of the local theaters.

It is also expected that all visiting ladies will attend the annual dinner to be held at the Commodore Perry Hotel on Feb. 3, beginning at 6:45 p.m. The dinner will be followed by dancing.

The entertainment will be in charge of H. R. Roudebush, secretary and treasurer of the Community Traction Company, and a committee of local ladies.

The manager of the Commodore Perry Hotel states that rates for rooms will range from $3.50 to $7 for one person in a room, $5.50 for two persons in a room with full-sized double bed and $8 and $9 for two persons in a room with twin beds.

Consideration of two amendments to the constitution and one amendment to the bylaws of the association will be given at the annual meeting. The amendment to Article IV, Sec. 1, of the constitution has the purpose of expanding the membership of the executive committee, while the amendment to Article X deals with the method of adopting amendments to the constitution. Article IV, Sec. 2, of the bylaws would be amended to make the dues of supply members $15 per year, effective with the calendar year 1927.

New York Meeting and Dinner on Jan. 25

SPEAKERS at the dinner of the New York Electric Railway Association on Jan. 25 will be the Governor of New Jersey, Hon. A. Harry Moore, and Dr. W. Warren Giles, a constructive humorist. Dr. Giles spoke at a meeting of the New York association two or three years ago and impressed his hearers most favorably with his wisdom and humor.

The committee in charge of the program for the day sessions has provided an added attraction, besides the papers announced last week, by the acceptance of L. S. Storrs to give some observations of his recent European tour. The committee also announces the formal discussions to follow the paper by H. K. Bennett on "Accident Prevention" by the gentlemen named below:

F. B. Wright, director publicity New York Railways.

A. L. Hodges, assistant to vice-president and general manager Brooklyn City Railroad.

C. P. Segard, assistant secretary Third Avenue Railway.

A. D. Brown, claim agent New York State Railways, Syracuse, N. Y.

R. R. Hadsell, general superintendent transportation New York State Railways, Rochester, N. Y.

Discussion on the paper by Samuel Porcher on "A Modern Inventory and Purchasing Methods" will be by R. C. Harris, general storekeeper Pennsylvania Railroad.

The meeting is at the Commodore Hotel, New York City.

American Association News

Unification of Car Design

DECISION was reached as to the work to be undertaken by the committee on unification of car design during the coming year and a preliminary report was drafted at a meeting held at association headquarters, New York City, on Jan. 6. Those present at the meeting were H. H. Adams, chairman; J. A. Brooks, C. A. Burleson, A. L. Kasemeier, John Lindall, Victor Willoughby, W. L. Barclay, Jr., representing W. J. Clardy and C. W. Squier, representing Charles Gordon.

Replies received from numerous railway officials commenting on the report of the committee on essential features of car design which was sent out in June, 1926, were gone over in considerable detail by the committee. It appeared that to further the use of the car design submitted it is desirable for the committee to act as a clearing house for questions and for solving problems which would come up in trying to adopt the general dimensions proposed to specific cases where new equipment was being purchased. The committee decided to extend its services in this connection. Various railway officials who are considering purchase of new cars are invited to submit their problems to the association, and the work will then receive special attention by the committee.

It also appeared desirable to use some standard designation for the designs of cars submitted by the committee on essential features of car design. The committee recommended that cars covered in the report be designated as A.E.R.A. city car design and A.E.R.A. interurban car design. A progress report that was drafted by the committee will be sent through the regular channels so as to be distributed as soon as possible.

The News of the Industry

Suggestion Offered for Seattle Railway's Solvency

Several suggestions for placing the Seattle Municipal Railway, Seattle, Wash., on a solvent basis are offered in a report to the City Council by W. J. Clardy, railway engineer, employed by the Westinghouse Electric & Manufacturing Company, which recently offered to finance Mr. Clardy's survey of the municipal railway situation. He suggests operating the street railway either as an industry in which the car riders, who provide the revenue, are given first consideration, according to fundamental principles of business, or operate it for the convenience of all citizens whether they are car riders or not, but not attempting to do both. He further recommends placing the railway department under centralized management to eliminate the conflicting functions of the superintendent, the Mayor and the City Council.

Mr. Clardy's recommendations for operation methods coincide with plans already recommended by D. W. Henderson, superintendent of the railway, and Clark R. Jackson, superintendent of the utilities department, and include rerouting of cars as put into effect recently. Other suggestions include installation of loading platforms at heavy loading points and providing better means of marking all safety zones, putting into effect a "pay-enter" inbound and a "pay-leave" outbound fare collection system to decrease the time required to collect fares, and promoting the sale of tokens by local business institutions to reduce change-making on cars. Of the financial phase, Mr. Clardy declares that the railway is not handling a sufficient number of passengers per car-mile.

St. Louis Seeks 8-Cent Fare Suspension

Suspension of the 8-cent street car fare schedule for the United Railways, St. Louis, Mo., which Receiver Rolla Wells has notified the Missouri Public Service Commission will be put into effect on Feb. 7, has been asked by the city of St. Louis in a petition filed with the Public Service Commission. The city's counsel contends that an audit of the company's books and records ordered by the commission on June 14, last, soon will be completed and that the commission should not permit any increase in fares until the results of the audit are known. "The audit is very material to a proper and final determination of the issues," the city's petition states, "and the city believes the commission cannot reach a fair and intelligent decision in this matter until it has before it the results of operation and of the additions to the property as they will be revealed in the audit."

Receiver Rolla Wells on Jan. 8 notified the state commission of his determination to increase the fares for adults from 7 cents to 8 cents effective Feb. 7. Should the state commission suspend the schedule as the city requests, the company may either await the results of the commission's decision when the results of its audit are revealed or it can go into the federal court pleading that the present rate of fare amounts to confiscation of its property. Should Receiver Wells take the latter course the city will make the defense that the case is in the hands of the state commission, from which an early decision is expected.

The first petition of Receiver Wells for increased fares was filed with the state commission on June 14. The company seeks to charge an 8-cent basic fare, but plans to sell two tokens for 15 cents. The city in opposing the increase has contended that the company is operating its city lines profitably and that the city car riders should not be expected to carry the burden of maintaining certain unproductive lines which are operated by the company in St. Louis County.

Committee Hearings on Chicago Settlement Plans

Corporation Counsel Thinks Blair Billion-Dollar Plan Impossible of Consummation—Further Action on It Unlikely Now—Messrs. Lisman and Harlan Discuss the Lisman Plan

With the six months extension of the expiring Chicago Surface Lines franchises approved by the local transportation committee and company officials and practically certain of acceptance by the sole remaining arbiters, the federal court for the north side lines and the City Council for the city, sessions of the local transportation committee during the week ended Jan. 21 were devoted almost entirely to scrutinizing the three traction settlement plans now before it.

Because the tremendous financial burdens which it would place upon the city would entail amendments to laws and possibly to the state constitution, the $1,000,000,000 unified transit plan recently made public by Henry A. Blair, president of the Chicago Surface Lines and co-receiver of the north and west side lines, was declared to be practically impossible of fulfillment by Corporation Counsel Francis X. Busch, when the plan came up for initial hearing at the local transportation committee meeting on Jan. 17.

COST TO CITY CONSIDERED STAGGERING

Differing from the pending surface and elevated line ordinance by virtue of its greater scope, the Blair plan, an abstract of which appears elsewhere in this issue, proposes to extend the existing surface, elevated and bus systems of the city into a single gigantic corporation, representing by 1950 a gross investment of $1,003,626,000. Of this huge total, the company would invest $563,274,000, while the city would be required to invest approximately $440,000,000 for subways and elevated lines. The average fare under the scheme would be 7.35 cents, with a maximum fare of 7.71 cents in 1933 and a minimum fare of 7.06 cents in 1950.

Some of the flaws in the financial plan were pointed out by Mr. Busch, when E. J. McIlraith, surface lines engineer, who explained the Blair proposal to the Aldermen, intimated that it was based on the assumption that of the total costs for subways and elevated lines to be built by the city under special assessment, 75 per cent would be raised by special assessments of the property owners and 25 per cent supplied by the city by general taxation as public benefits.

In support of his belief that this assumption is fallacious, Mr. Busch referred to other public improvements in which the city's share almost invariably had exceeded 60 per cent of the total cost. He said:

> Even if we could carry out the program on a 50-50 basis the city would have to raise $220,000,000. Under the present debt incurring limitation, which is now virtually exhausted, it would be impossible for the city to raise the $440,000,000 necessary to defray its share of the costs under the proposal.

Mr. McIlraith's answer to this objection was to urge that the assessed valuation of property be increased.

It was also brought out during the hearing that no compensation to the city nor rentals for subways built by the city had been taken into consideration in reckoning rates of fare. This additional outlay, it was indicated, would further increase the rate of fare contemplated.

Mr. Busch concluded his indictment of the plan with the assertion that the new organization would want a 7½ per cent rate of return, while the return to the elevated lines is now less than 3 per cent and that to the surface lines just a trifle over 6 per cent.

Although no direct statements were made by traction or bank officials who attended the meeting as to the status of negotiations toward consolidation of properties involved in the discussions, Weymouth Kirkland, attorney for Mr.

Blair, told the committee that the rate of return to the new company as well as the type of franchise to be offered by the city must first be determined before consolidation could be agreed upon. The plan would require enabling legislation, he said, first, to permit the surface and elevated lines to consolidate; second, for authority to issue terminable permits and, lastly, to enlarge the city's power over special assessments.

Asked by Alderman Donald S. McKinlay why the two systems could not tentatively agree to consolidate, Albert W. Harris, president of the Harris Trust & Savings Bank and member of one of the Surface Lines bondholders' protective committees, declared that "there must first be an agreed valuation and rate of return." "On Feb. 1 the bondholders will assume control of the Chicago Railways," he said. "The quickest way to get a merger is a foreclosure and sale."

In urging the passage of terminable permit legislation, Mr. Harris remarked that the poor market for electric railway securities today is primarily due to the short-term franchise.

While no criticism was offered on the physical features of the Blair proposition, as a result of these unexpected obstacles and disagreements over financial details, many of the Aldermen bitterly denounced the belated effort to rush through a settlement. For this reason, it is unlikely that any further action will be taken in the matter for some time to come.

REVISED LISMAN DRAFT DISCUSSED

The Lisman plan, a revised draft of which was presented to the Aldermen in the form of an ordinance on Jan. 10, likewise came in for some unfavorable criticism by Corporation Counsel Busch at a committee hearing on Jan. 15.

Mr. Busch pointed out that while the Lisman ordinance was not contingent upon legislation as is necessary to make the surface-elevated lines ordinance valid, many of its provisions might be changed or nullified by the Illinois Commerce Commission.

Chief among these provisions which might come under the jurisdiction of the commission, which it has been sought to avoid, are the plans for amortization of the properties, the barometer funds for fares and the rates of return, he declared.

A clause in the ordinance providing for the immediate expenditure of $55,000,000 for track extension, the funds to be obtained by a bond issue for that amount, was condemned on the ground that the commission might exercise its legal right to disapprove the bond issue.

In replying to this charge in a formal statement made public the following day, Frederick J. Lisman, author of the plan, said that he was fully cognizant of the power of the Illinois commission to pass on security issues and other matters and that he did not propose to request their approval of anything which was "improper or unreasonable." He explained that under the Lisman plan car riders would be asked to provide only about 6 per cent on a reasonable valuation, while the average return permitted utility companies by the courts and commissions is at least 8 per cent on the capital invested. He added that with a charge so moderate "we have nothing to fear in the way of unfavorable rate decisions."

Final action on the Lisman ordinance has been postponed to give Mr. Harlan an opportunity to submit a brief on its advantages and a detailed financial set up.

Service Survey Started in Philadelphia

Transit Company Says City-Center Congestion Is Limiting Factor Fixing What It Can Do

The Philadelphia Rapid Transit Company, Philadelphia, Pa., in a letter to Public Service Commissioners Beamish and Benn, in charge of the Public Service body's investigation of transportation facilities in Philadelphia, has acknowledged that its service had become "increasingly deficient," but attributed that condition to city-center traffic congestion. The letter was written by Thomas E. Mitten, chairman of the executive committee. It reads as follows:

> P.R.T. welcomes the investigation of its service now being undertaken here under the direction of your experts, headed by Dr. Snow, because it will afford the greatly desired opportunity to have the real causes of the interrupted—and consequent unsatisfactory—service impassionately analyzed, with adequate remedies recommended to be forthwith made effective.
>
> P. R. T. has all along acknowledged its present service to be becoming increasingly deficient, but claims the causes to be beyond its power of control and that its present service is necessarily limited by the number of cars it can get through the city-center district during the hours of most congested traffic.
>
> This is a matter which can be made subject to determination through the investigation now under way, as is also the truth or falsity of the charge that P. R. T. did actually decrease its street car service to drive its prospective passengers into its higher-fare motor buses and taxicabs.
>
> Observing persons already know, from what they see every day while riding on the cars, that regularity of service is made impossible by the use of city streets as now allowed in way of motor parking and other permitted forms of traffic interruption, but the charge that P. R. T. so misuses its powers as to drive its passengers from the street car to the motor bus and taxicab—for sake of the higher fare—is a falsehood that is not easily overcome and one which we would, therefore, respectfully ask that your examining experts give first attention.

The commission, in reply, said:

> The Public Service Commission today (Jan. 13) commenced its co-ordinated investigation of the services being rendered by the P. R. T. and buses for these services. This investigation will, from time to time, call upon the officers and employees of the P. R. T. for information and records. The commission acknowledges your tender of co-operation.

At the outset of the survey Commissioner Beamish invited every individual car rider or business organization with suggestions to make with respect to service to mail their ideas to the commission.

It is planned to have the physical survey well under way before the arrival of Charles C. McChord, former chairman of the Interstate Commerce Commission, who has been engaged by the state body to study and submit recommendations on the legal and policy phases of the survey.

Petitions for Commutation in Schenectady

Public Service Commissioner George R. Lunn on Jan. 7 held a hearing on the petition of the Schenectady Railway for permission to issue an additional commutation ticket based on the rate now in effect in interurban territory, by adding the local fare rate in Schenectady, Albany and Troy, N. Y., to the rate from the first interurban point outside the cities. The new commutation will be optional with the purchaser, the one in use at present being continued, by which the user pays his fare by commutation ticket to a city line and a cash fare within a city.

If he desires to save himself the bother of paying a cash fare he can purchase the new commutation ticket, which will permit him to ride within the three cities without paying the cash fare. Tickets are good for 50 rides within 30 days and unused or partially used tickets will be redeemed by charging full rate for the number of tickets used.

It is proposed to issue two forms of commutation tickets, one as at present, good from interurban points to a city line, not including the city fare, and the other good from interurban points to include the city fare with the interurban fare. The purchase of either ticket is optional to the passenger.

183 Trains in Chicago Loop in Rush Hour

What is believed to be a world's record in movement of cars past a given point was established by the Chicago Rapid Transit Company on Saturday morning, Jan. 8, when a total of 1,017 cars, comprising 183 trains, entered the Loop during the rush hour.

This is the third time in the past three months that the Rapid Transit Lines have set new records in transporting the throngs of workers to the Loop during the morning rush period.

On Oct. 7 a total of 989 cars arrived in the Loop during the morning rush hour. This number was raised to 992 on Dec. 4 and to 996 on Dec. 31.

Bernard J. Fallon, vice-president in charge of operation, said that the company would continue its efforts to better "the world's record."

Would Advance Centralia Rates

The Centralia & Central City Traction Company and the Centralia Traction Company of Centralia, Ill., have filed schedules with the Public Service Commission in which it is proposed to advance railway rates. Under the new scheme the rates would be as follows:

Adult Cash Fares: Single cash fare, 10 cents.

Ticket Fares: Three tokens or tickets 25 cents.

Children's Fares: All children under six years of age may ride free when accompanied by an adult.

Cash Fares: Children six to twelve years of age, single cash fare, 5 cents.

Ticket Fares: Six tokens or tickets for children from six to twelve years of age, 25 cents.

The present rate for adults is 6 cents and for children 3 cents. Transfers would be issued from one line to the other as under the present arrangements.

Discussion Continues in New York

Nothing Tangible on Transit Has Been Done Lately in New York, Not Even on Buses

There has been no diminution recently in the discussion of transit matters in New York. Chairman Dahl of the Brooklyn-Manhattan Transit Company has issued several more open statements on the matter, Mayor Walker has reiterated his previous stand with respect to the bus matter and men prominent in public life have discussed the matter, notably before the National Republican Club. This last forum was held on Saturday afternoon, Jan. 15, and the remarks were broadcast over the radio.

The latest of Mr. Dahl's letters are known as Nos. 9, 10, 11 and 12. They go into various matters in detail, but letter No. 12 deals more particularly with the matter of the repetition of early mistakes in the prosecution of the city's present transit policy, the matter of why competitive methods fail and the possibility of the city saving $150,000,000 by proper regard for co-ordination and the utilization of facilities not now effectively used. The other communications by Mr. Dahl include a letter to the editor of the *World* and a report on the rapid transit situation in New York by George F. Swain and Parsons, Klapp, Brinckerhoff & Douglas, in which they express the belief that "the best unified transportation system should include not only subway and elevated lines but surface lines and buses as well." "Many large cities are unifying their transportation systems," say the engineers, "but only New York City appears to be following the opposite policy."

Mayor Has Just Begun His Fight

On Jan. 20 the Mayor indicated that he had just begun his fight to put buses on the streets as quickly as possible. To that end he has postponed indefinitely his projected trip to Cuba, on which he was to have started on Jan. 22, and announced his intention of getting a vote at next week's regular meeting of the Board of Estimate on the question of having the Board of Transportation prepare contracts for bus franchises for Manhattan, the Bronx, Brooklyn and Queens. The Mayor indicated after the meeting of the board on Jan. 20, at which he failed in a similar attempt, that he expected to have a majority of the votes on the board to pass his resolution next week, but was still short of the twelve votes necessary for the actual award of the franchises.

The speakers at the meeting before the National Republican Club were Colonel Sheppard and Messrs. MacAneny, Curran and Quackenbush.

Mr. MacAneny, former chairman of the Transit Commission, said that the lack of settlement of the transit problem has held back the growth of the city for many years. The traffic today was double what it was in 1913. Even the subways as they are today have increased the value of property 50 per cent. The extensions of the old lines were more important than the building of new disconnected units. At the present time the branch lines were developed to better advantage than the trunks. The city was suffering from a lack of trunks. At present there were seventeen branches or streams of traffic flowing through the two existing trunks north and south on Manhattan. While these were used to capacity and sometimes to more than capacity, the branch lines were used not to exceed 65 per cent at the rush hour and some as low as 35 per cent.

The Transit Commission was formed by the act of 1921 and four months after it began to function proposed a plan opposed by former Mayor Hylan. Instead, the old administration went ahead with an independent system, one unit of which on 53d Street, according to the present plans, would cost $112,000,000 and would be utterly useless without the extension to Jamaica, and no immediate plans had been developed for this extension. Therefore it will be most improvident to construct this short unit. The independent lines were estimated to cost $625,000,000. The construction of the Eighth Avenue subway so far was such that it can be linked into the other tubes and be made an additional trunk unit. If the remaining contracts were granted the city would be committed to an independent system, much of the cost of which will have been wasted if the line is not co-ordinated with the present systems.

By co-ordinating the transit lines with the existing systems $150,000,000 can be saved in subway construction and an additional $150,000,000 for equipment would be transferred from city funds to company funds, since the companies are obligated to furnish this equipment when the tubes are leased.

Mr. Quackenbush, who is general counsel for the Interborough Rapid Transit, said the first mistake was made when the two systems were started. The present Interborough Rapid Transit Company for ten years has performed an enormous task without adequate funds. The 5-cent fare of 1913 has depreciated to a 3-cent fare today. The travel on the system has increased tremendously and in one 24-hour period just previous to Christmas 3,933,000 passengers were handled in one day.

No Parking Passes in Philadelphia

The City Council of Philadelphia, Pa., passed unanimously on Jan. 13 the drastic ordinance banning parking in the central section of the city, and later it was signed by Mayor Kendrick. Director of Public Saftey Elliott explained that he would carry out his promise that the measure should be taken as of an experimental nature. He said he would meet the public safety committee of the Council once a month and report on the progress of the ban. If after a reasonable time it was demonstrated that enforcement was not possible, he would then ask the Council to amend the law.

The provisions of the bill were outlined in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 8, page 93, and are referred to elsewhere in this issue.

Denver Fare Case Argued

Supreme Court Hears Contentions of Appellee and Appellant in Question of City Regulation of Fares

Questions involved in the regulation by a city of fares to be charged by an electric railway are before the Supreme Court of the United States in the case of City and County of Denver, Appellant, vs. E. Stenger, as receiver of the Denver Tramway, Appellee, No. 112.

Argument was commenced on Jan. 11, 1927, by Thomas H. Gibson for the appellant and was continued on Jan. 12 by Mr. Gibson and Mr. May. Gerald Hughes argued the case for the appellee.

The appellee contends that this is a suit which is in essence a rate suit, involving an averment of confiscation and the deprivation of property without due process of law. Appellant contends that, instead, the petition filed by the receiver "concerning fares and operating conditions" was an ex parte proceeding which sought the advice and direction of the trial court and prayed that it might instruct and authorize the petitioner to assert certain rights which he claimed to exist in the tramway and himself as receiver.

It was said the only theory on which the appellee based any claim to right to an increased fare was that of an alleged confiscation of the property of the tramway in violation of the Fourteenth Amendment of the Federal Constitution and similar sections of the Constitution of Colorado, and that this theory is based upon the following assumptions:

1. That the ordinances upon which the only alleged property rights of the Tramway which the appellee claims to have been violated are based do not amount to contracts in respect of fares.
2. That even if they were contracts they had been waived by the City Council in attempting to aid the tramway company in allowing increased fares in time of stress.
3. That the mutual obligations of the parties have been destroyed by the regulatory power exercised by the city.

It was contended for the appellant that the trial court was without jurisdiction to enter any other than a decree of dismissal. It was averred that the court erred in rejecting the city's expert testimony on valuation, thereby sustaining the company's exceptions and objection to the competency and qualifications of the city's chief expert witness.

The position of the appellee was that the final decree of the District Court, so far as the questions of jurisdiction, of confiscatory fares and other matters passed upon by the District Court of Appeals are concerned, is based on and follows the mandate and opinion of the Circuit Court of Appeals and that this court is without authority on this appeal to review the pending case in such respects.

And further it was stated that if the question of a 5-cent contract were before the Supreme Court as one of first review, independent of the Circuit Court of Appeals' decision, that the Supreme Court must hold that there never was such an enforcible contract which would justify confiscation and that subsequent regulation by the city has in any event displaced such alleged contracts.

Increased Fares in Watertown

The Public Service Commission on Dec. 31 granted the petitions of the Black River Traction Company and the Watertown Transportation Company for permission to increase electric railway and bus fares in Watertown, N. Y., and discontinue the sale of round-trip tickets between Watertown and Glen Park.

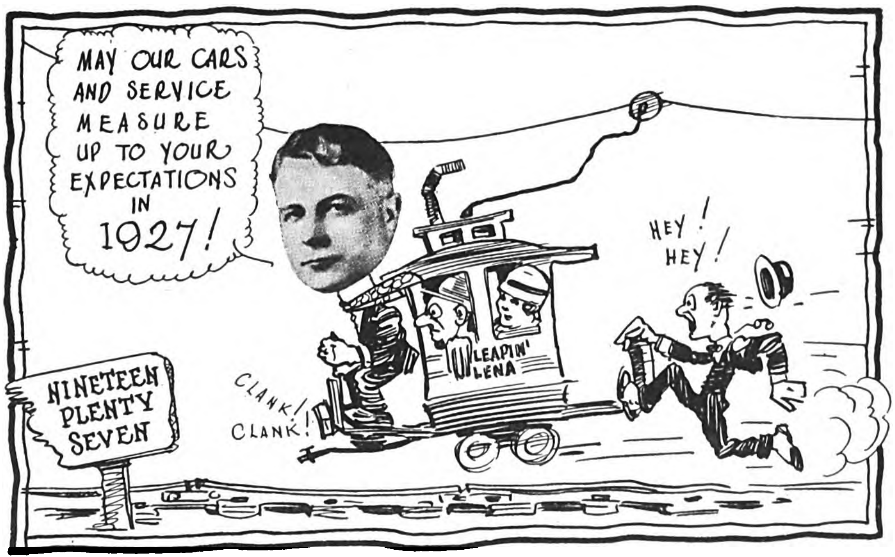
Fares are now 7 cents with sixteen commutation tickets for $1. Fare to Glen Park is 10 cents and round-trip tickets 15 cents. The orders provide that a cash fare of 10 cents may be charged for a continuous ride within the city until Dec. 1, 1927; also that commutation tickets shall be sold at the rate of seven for 50 cents, making the ticket fare 7⅐ instead of 6¼ cents and entitling the holder to the same privileges as cash fare except a transfer charge of 3 cents to the Washington and Franklin Streets and the Arsenal and Mill Street lines. At State and High Streets transfers will be given to the High and Pearl Streets line without charge. The order relating to the Glen Park line authorizes the discontinuance of round-trip tickets, making the fare 10 cents each way.

The original franchises granted these companies contained limitations as to fare within the city. These limitations were waived by the Common Council on Oct. 18, 1926, permitting an increase until Dec. 1, 1927.

Commissioner Van Voorhis in his memorandum accompanying these and other representing all walks of life orders said that it appeared from the financial statement that there had been a falling off of the gross revenue of the company for the past three years of approximately $26,000.

Greetings from Grand Rapids

Favorable comment has reached L. J. DeLamarter, vice-president and general manager Grand Rapids Railway, Grand Rapids, Mich., on his novel New Year's card, "The Skipper of the Town Trolley Says," the idea behind which is shown in the illustration reproduced herewith. The letters of commendation received from the newspaper men, city officials and others representing all walks of life reflect a spirit of good will and cooperation toward the railway in its efforts to give Grand Rapids a modern transportation system. When Mr. DeLamarter sent out about 2,500 of these cards as a personal greeting it was his idea to get a "little kick" out of an old subject. The card is to be reproduced in "Trolley Topics."


MAY OUR CARS AND SERVICE MEASURE UP TO YOUR EXPECTATIONS IN 1927!
HEY! HEY!
LEAPIN' LENA
CLANK! CLANK!
NINETEEN PLENTY SEVEN

A Fantastic New Year's Card from an Imaginative Man

New Blanket Franchise in Danville

The City Council of Danville, Ill., has adopted an ordinance granting the Illinois Power & Light Corporation a franchise to operate street cars and buses over the streets of the city. This was done after the length of the franchise had been changed from 30 to 20 years and made to specify that the company may abandon railway service and substitute buses only on the consent of the Council. Under the new franchise the entire system is included in one ordinance. Heretofore there have been separate franchises and grants for the different lines.

Terms of General Franchise Draft for Kansas City Approved

The City Council of Kansas City, Mo., has approved the general plan proposed by the special franchise committee of the Council for a basis for drafting a new franchise for the Kansas City Public Service Company. The vote on the plan was unanimous.

Discussion has arisen as to the question of valuation of the properties of the company. The proposed grant does not mention a definite valuation figure, but infers a valuation of $25,000,000, by allowing a $2,000,000 yearly income. This is 8 per cent on $25,000,000. This difficulty will probably be settled when the franchise committee starts work on the new draft.

The question of depreciation was clarified by A. N. Gossett, chairman of the committee. He stated that it is the intention of the committee to provide that depreciation shall be taken out of the net income of $2,000,000. Under the old franchise depreciation is regarded as part of operating expenses.

Pacific Electric Seeks Higher Fares

The Pacific Electric Railway has applied to the California Railroad Commission for permission to increase its passenger rates and fares throughout its system in southern California, alleging that its present rates are inadequate to provide a fair return upon its investment in its property. The applicant alleges that the valuation of its interurban and local railway lines and coach and bus lines is in excess of $85,000,000 and that its operating income for the first nine months of 1926 was $495,318 less than that for the first nine months of 1925. The operating income of the applicant, after deducting operating expenses for the year 1921, 1922, 1923, 1924, 1925 and 1926, was as follows:

1921	$3,192,424
1922	3,542,207
1923	4,463,751
1924	3,714,350
1925	2,356,581
Jan. 1 to Sept. 30, 1925	1,906,170
Jan. 1 to Sept. 30, 1926	1,410,852

The petitioner requests the commission to increase its fares as follows:

INTERURBAN SCALE

Kind of Fare	Present Rate per Mile	Proposed Rate per Mile
One-way fares	$0.0275	$0.03
Round-trip fares	.0225	.025
Ten-ride commutation	.02	.0225
Thirty-ride family tickets	.0175	.0175

(It is proposed to change the form of this ticket from 30-ride with 90-day limit to 20-ride with 60-day limit.)

46-ride school tickets; week-day tickets, calendar month tickets and 60-ride tickets reduced 20 per cent.

LOCAL AND MISCELLANEOUS FARES

Kind of Fare	Present Rate	Proposed Rate
Local within cities	$0.06	$0.07
Minimum interurban	.06	.07
L. A. between zone	.10	.12
Minimum L. A. interurban O.W.	.10	.12
40-ride school	.03	.03½
Strip tickets—Glendale	.05	.06¼

Ten-Cent Rate in Rome

Under an order of the Public Service Commission, the New York State Railways, effective on one day's notice, will establish a ticket rate of three tickets for 25 cents in the city of Rome, N. Y. There will be a 10-cent rate for passengers who do not purchase the three tickets. The new rates are effective for six months and thereafter until the commission shall otherwise order.

Evidence submitted before Commissioner Lunn showed the New York State Railways was operating in Rome at a loss, the average deficiency each year from 1920 to 1925, inclusive, being $18,954. Commissioner Lunn in a memorandum with the order showed that since November, 1921, when the company was directed to make certain improvements to its track and system in Rome, it had expended $134,129 in improving the service.

The commissioner said that service in the new residential districts of Rome would not warrant extension of existing lines and the question of the present service was considered unfavorable in view of the fact that new equipment was necessary.

Under the new rate additional revenue of $19,000 is expected. This is based on 80 per cent of the Rome riders using the tickets and 20 per cent paying the cash fare.

Rochester Men Receive Insurance Policies for Safety Records

Insurance policies have been issued to 350 motormen and conductors of the Rochester lines of the New York State Railways as a result of an accident prevention contest conducted under the supervision of Leon R. Brown, safety director, during the year 1926. These men operated the whole year without an accident and received the policies as a reward.

The policy is in the form of group insurance issued by the Travelers' Insurance Company and pays $10 a week compensation in case of sickness. The same amount is paid for disability due to non-occupational accidents and $1,000 in case of accidental death occurring outside working hours.

The company is continuing this practice of rewarding careful employees this year and at the end of 1927 a larger crop of men with spotless accident records is looked for. In a safety contest conducted among the different divisions, which closes May 1, members of the winning team will receive new uniforms.

Fitkin Utility Managers Convene

More than 225 managers and department heads of the Fitkin Utilities convened in New York and Asbury Park for their sixth annual convention on Jan. 18. After a jollification and reunion party held on the evening of Jan. 18, the entire convention moved in a special train to Asbury Park, where they made headquarters at the Berkeley-Carteret Hotel. Here, separated from the turmoil of the big city, the utility managers were free to discuss in an intimate manner the problems of their properties and learn of the policies and plans of the Fitkin management.

The utilities in this large group are combined under the leadership of A. E. Fitkin and are managed by the General Engineering & Management Corporation of New York, of which T. R. Crumley is president. This organization has had a spectacular growth in the last few years, and controls properties that today serve a thousand communities in sixteen states. The combined valuation of all the properties in this group is approximately $205,000,000 which is in the service of 500,000 customers. It is estimated that 1,750,000 people are served by the eight electric railways in this group.

While the reunion meeting on Jan. 18 was entirely informal and consisted of a buffet supper and entertainment features, A. E. Fitkin spoke a word of welcome. During the Asbury Park sessions several prominent men spoke, among whom were Senator William A. Stevens of New Jersey; Harold G. Hoffman, Congressman-elect from South Amboy, N. J.; Thomas J. Walsh of E. H. Rollins & Son, New York; A. K. Baylor of the General Electric Company, New York City; Ralph J. Ritchie, operating manager of the General Engineering & Management Corporation; Gen. Guy E. Tripp, chairman of the board, Westinghouse Electric & Manufacturing Company; Francis H. Sisson, vice-president of the Guaranty Trust Company, and R. F. Pack, president of the National Electric Light Association. The business sessions were divided into functional groups of accounting, engineering, customer ownership, and new business, and into the sectional groups of railways, gas, ice, electric and new properties.

Among the railway men present were J. J. Coleman, vice-president and general manager Scranton Railways; S. S. Crane, vice-president and general manager Altoona & Logan Valley Railway; V. A. Redfield, general manager Citizens Traction Company, Oil City; E. O. Shryock, general manager Youngstown & Suburban Railway, Youngstown, Ohio; B. E. Waltz and W. M. Willett, Aurora, Ill., and J. E. Wayne, vice-president and general manager York Railways, York, Pa.

News Notes

More Safety Cars Installed.—Safety cars have just been assigned to two more Atlanta, Ga., lines of the Georgia Railway & Power Company, the River and Soldiers' Home lines, bringing the total number of Atlanta lines using one-man safety cars up to eleven. With the placing of safety cars on these two lines, the number of such cars now in use in Atlanta has reached 100, and it is hoped that even more one-man cars can be added to the system later. The cars being installed are of the most modern type.

Outdoor Garage Plan Condemned.—The parking of automobiles at an angle from the curb on widened thoroughfares has been condemned by Director of Streets and Sewers Brooks of St. Louis, Mo., and he has urged the defeat of a proposed ordinance that would permit such practice on Delmar Boulevard and on De Baliviere Avenue. "Why widen our streets if we propose to make them public garages?" he has asked members of the Board of Aldermen. He has pointed out that it is folly for the city to compel taxpayers to pay for costly improvements designed to speed up traffic along the streets if such work is to be nullified through the passage of ordinances which will reduce the roadway capacity of such streets for moving vehicles at least 50 per cent.

Baltimore Has Thermostats.—The United Railways & Electric Company, Baltimore, Md., has completed the installation of thermostats in all the street cars. This action was taken under revised regulations adopted by the Maryland Public Service Commission and agreed to by the railway. A temperature of 45 deg. will be maintained automatically in all the cars at all times.

Gold Stars for No Accidents.—Gold stars were presented to 53 trainmen of the Jacksonville Traction Company, Jacksonville, Fla., on Jan. 7 for remarkable accident records. These trainmen included two who operated cars for twelve years without having an accident charged against them. Each of these men has covered 324,000 miles of the tracks in Jacksonville. Tribute was paid to the gold star men by Manager Ingle at a banquet held in their honor. Mr. Ingle presented the gold stars and acted as toastmaster. Mayor Alsop said that the record established by these men showed the careful manner in which street cars were operated and also the efficiency of the Jacksonville Traction Company. Trainmen of the company are now engaged in a three-months safety contest for prizes amounting to more than $1,000.

Employees to Write Plays.—Women employees of public utility companies are invited by Zilla R. McClure, Milwaukee, chairman of the women's committee of the Wisconsin Utilities Association, to participate in a playwriting contest. The sketch must deal with some human interest phase of the utility business and must not take more than twenty minutes for presentation. Copy must be submitted to Mrs. McClure before March 1. First prize will be an electrical appliance valued at $25 and second prize will be a $15 electrical appliance.

Wants Two-Cent Fare Increase.—The Citizens Railway, Clarksville, Tenn., has petitioned the Tennessee Railroad and Public Utilities Commission to increase its cash fare from 5 cents to 7 cents. The company operates 5 miles of line.

Fares Increased.—The Public Utilities Commission of Maine has granted the petition of the York Utilities Company to increase fares, effective at once. The changes affect the zone from Johnson's Crossing, Sanford, Me., to Springvale, Me., where the fare is increased from 5 cents to 10 cents, or ten tickets for 80 cents. Student rates remain the same.

Wages Reduced in St. Petersburg.—A reduction in wages of motormen and maintenance men of the Municipal Railway, St. Petersburg, Fla., amounting to approximately 5 cents an hour for a nine-hour day was announced recently by R. E. Ludwig, Director of Public Utilities. effective on Jan. 7. By this action the wage scale reverts to its status before July 1, 1926, when a 5-cent increase went into effect. The cut will affect about 70 men. Motormen formerly received 65 cents an hour.

Changes Advertising Tactics.—The Oklahoma Railway recently announced that instead of using company advertising on car cards and the white street cars it will utilize this space for advertising Oklahoma City, Okla., during the coming year. This, the company believes, will make a favorable impression upon thousands of visitors to the capital city.

Sues City in Damage Case.—The Eighth & Ninth Avenue Railway, New York, N. Y., recently consolidated, served Corporation Counsel Nicholson on Jan. 10 with a summons and complaint in a $2,700,000 damage suit against the city. The papers allege damages to the surface line on Eighth Avenue by construction of the Eighth Avenue-Washington Heights subway. It is alleged that subway construction caused injury to public tracks and to other property estimated at $2,500,000 and has caused delays in operations which have resulted in a $200,000 loss in revenue.

Recent Bus Developments

Injunction Sought in Louisville

Railway Proceeds Against Threatened Competitor — Bus Manufacturer Cancels Contracts for Vehicles

Suit to enjoin the People's Transit Company from operating passenger buses on the streets of Louisville, Ky., in competition with the Louisville Railway was filed in Chancery Court recently, but as the prayer of the petitioner does not seek a temporary restraining order the case will be assigned to one of the chancery divisions in the regular course of business and will then be set for a hearing at an agreed date.

It is alleged in the petition that the defendant company is threatening to exercise certain franchise rights to which it is not entitled, and that it should be enjoined from exercising this privilege until it has acquired such franchise in accordance with the provisions of the laws of the State of Kentucky and ordinances of the city of Louisville.

COMPANY NOT ENTITLED TO RIGHT

The petition further sets out that the acts threatened by the defendant company, which it will commit unless restrained and enjoined by the court, "will deprive the plaintiff of a great amount of revenue arising out of the transportation of passengers, and will thus impair the value of the plaintiff's property, its rights and franchises, and will necessitate the raising of the rate of fare to be charged by the plaintiff for the transportation of passengers on all the plaintiff's lines within the limits of the city of Louisville, in order that the plaintiff may receive a reasonable return, for adequate service to the public."

The petition further avers that the railway is required, under the terms and conditions of its franchise obligations, to continue to give service to the public in the transportation of passengers over all lines operated by it, whereas the defendant, if permitted to operate under a mere annual license, as it is threatening to do, will, unless enjoined by the court, pick out the most profitable routes in the city for its operation and be at liberty to discontinue any or all of its operations any time it sees fit.

COMPANY'S ATTITUDE STATED

The attitude of the company has been stated by James P. Barnes, president of the railway, as follows:

> The Louisville Railway has heretofore announced its policy to develop a homogeneous transportation system for the entire city of Louisville through the co-operation of street cars and buses. The co-ordinated operation has already been several months in force and the policy of its continuation and extension will be followed in line with the original announcement.
>
> It stands to reason that a general and comprehensive transportation system serving all parts of the city is better than congestion and over-service in some parts of the city and insufficient or entire lack of service in other parts.
>
> Therefore, it is our best judgment based on the whole history of transportation, that the best possible service, at the lowest possible cost, can be rendered only by a complete co-ordinated system under proper governmental regulation.

The plan of the People's company was to operate on Broadway, Market Street and other main thoroughfares in competition with the Louisville Railway, and in furtherance of its plan the bus company ordered seven buses from the Mack company through B. J. Brumleve, Louisville manager of the Mack-International Truck Company. This order, however, was rejected because of the unfair competitive condition involved.

COMPETITION STARTED ON BROADWAY

The People's Transit Company finally got its line started on Broadway on Jan. 17, or a month and two days later than it had expected to start service. After the Mack truck interests canceled the contract the People's Transit Company announced that it would secure other buses and go ahead. It arranged to install Reos. Tickets are sold at four for 25 cents, or sixteen for $1. The cash fare is 7 cents, the same as that of the railway. The line runs from Shawnee to Cherokee Park, a distance of close to 10 miles. Service is from 5:30 a.m. to 12:30 midnight. The company plans other lines on leading streets of the city.

The railway's suit was to have come up last week, but the hearing was delayed by the illness of a judge. Licenses for operation of the buses were issued just as any other auto license is issued.

Ottawa Joins Gray Line Owners

The Ottawa Electric Railway, Ottawa, Ont., has accepted an invitation to become a member of the Association of Gray Line Owners, an organization limited to companies operating the finest type of sightseeing motor coaches in the large cities of Canada and the United States.

In accordance with the terms of membership the motor coaches of the Ottawa Electric Railway will be painted one of the various shades of gray and will carry the association's diamond-shaped insignia bearing the words "The Gray Line."

The enrollment of the Ottawa Electric Railway in the Gray Line Association places Ottawa on the de luxe tourist map. The city will be advertised in all Gray Line literature throughout the United States and Canada as one of the cities worth visiting. Several pages in the association's sightseeing booklet, hundreds of thousands of which are distributed each year, will be devoted to the capital of Canada.

Montreal and Toronto are also members of the Gray Line Association and tourists when visiting these other cities will be routed by way of Ottawa.

Bus Does Well in Davenport

Three Months Operation by Tri-City Railway Proves Worth as Ally to Railway

The operation of motor coaches in Davenport, Iowa, for the last three months has brought out the fact that these vehicles were not only popular at their inception, but that their popularity has remained after the period of curiosity was past. Under the management of employees, who have been commended for the way they have taken hold of this new type of transportation, the motor coaches have proved safe and dependable in all sorts of weather.

Motor coach operation was started by the Tri-City Railway of Iowa in Davenport, on Oct. 3, 1926, over a route 4.76 miles long. This service replaced street car service on West Seventh Street, Le Claire Street and East Locust Street. In addition it provided a route extension into the residential district along Belle Avenue, which was the first extension of transportation service in the city of Davenport in ten years. Through the introduction of this motor coach line the company was also enabled to reroute the Oakdale service over a more direct and satisfactory line to the business district along Fifteenth Street and Brady Street, combining it with the Vander Veer Park line and making one of the best patronized rail routes in the city.

Upon the introduction of service on the motor coach line the company offered to furnish a fifteen-minute service throughout the day with four vehicles. In order to guarantee sufficient vehicles for regular service and provide for some additional tripper service, the company bought eight vehicles or twice the number used for regular service. Soon after the service was started two additional coaches were introduced to give a 7½-minute interval on the route from the business district to the east end from 4 to 6 o'clock in the afternoon. It was then found advisable, as the holiday trading season approached, to put on a ten-minute service throughout the route in the afternoon between 4 and 6 o'clock and in addition run enough extra units to make a five-minute interval to the east end. This required eight coaches in all, or the entire number available. Later a ten-minute service throughout the route in the morning hours from 6 to 8:30 was put in effect and on Dec. 18, which was the last Saturday before Christmas, a special 7½-minute service was given throughout the entire route from noon until 10 o'clock at night. Fourteen and one-half more vehicle-hours or 125 additional coach-miles a day are being provided than were contemplated at first.

The company's equipment consists of six 21-passenger coaches made by the Yellow Truck & Coach Manufacturing Company and two Mack 25-passenger, gas-electric motor coaches. The last two units named are of a special design, just recently brought out. All of the above units are provided with special genuine leather seats of the most comfortable design. In addition to the above equipment one more Mack 29-passenger, straight gas-motor coach was purchased recently. A feature which shows the company's earnest desire to serve was the fact that this motor coach was unloaded at 2 p.m. Friday afternoon, Dec. 17, taken to the shops of the company, thoroughly inspected by the manufacturer's agents, cleaned, a register installed, the destination sign painted, dried and installed and the coach placed in operation during the evening rush in just two hours and 45 minutes.

The operation of the motor coach has been especially satisfactory from the standpoint of freedom from accidents and dependability in service. Injuries, of course, have been practically nil. In regard to dependability of service, coaches have completed their schedules at least 99 per cent of the time.

Even in so short a time the company has developed considerable revenue from chartering the coaches for special service. Trips have been made to Rockford, Peoria, Burlington, Peru and other cities, to say nothing of numerous charter trips around the Tri-Cities. The company is interested in securing this type of business, as a large amount will justify keeping a greater number of units on hand for use in the peak hours of city service.

Wants Rochester Buses Under Service at Cost Contract

The New York State Railways, Rochester Lines, has filed a petition with the Public Service Commission asking that all bus lines in the city of Rochester be placed under the provisions of the service-at-cost contract by which the electric railway system is operated.

The railways petitioned for transfer of the franchises of the Ridge Road and Dewey Avenue feeder bus lines from the Rochester Interurban Bus Company to the Rochester Railways Co-ordinated Bus Lines, Inc. Both are subsidiaries of the railway. The latter is to operate in the city only, under the terms of the service-at-cost contract between the railways and the municipality.

Railways Commissioner Charles R. Barnes said that the approval of the commission was sought in this step in order to segregate the city bus lines from the company's interurban routes operated by the Rochester Interurban Bus Company.

Public Service Commissioner Charles Van Voorhis, to whom the railway's petition was submitted, reserved decision.

Bus Development Noted in Oklahoma.—Co-ordination of railway and bus service under the management of electric railways progressed rapidly in Oklahoma during the past year, according to the Oklahoma Public Utility Information Bureau. This development included installation of many new bus routes in Oklahoma City serving as feeders to lines of the Oklahoma Railway, purchase of several bus lines in Tulsa by the Oklahoma Union Railway and conversion of the electric railway urban and interurban system at Shawnee into bus service lines.

Miami Commission Passes Jitney Ordinance

The ordinance which eliminates jitneys from the close-in business section of Miami, Fla., was passed by the City Commission on Jan. 3. It will become effective within a month. Recently representatives of the jitney lines protested passage of the ordinance and they were told to submit a plan which might permit them to retire from the field on an adjusted compensation basis. However, they informed the commission that it was the desire of most of them to continue. This will be possible only through legal defeat of the ordinance. Routes now being served by jitneys will not be deprived of transportation, as the commission demanded a guarantee from bus lines that wherever a jitney was removed it would be supplanted by one of the larger vehicles. The officials claim the new ordinance will relieve traffic congestion and represent a large saving annually to the taxpayers. The jitney ordinance was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 15, page 143.

Engineers Against Buses on Park Avenue, New York

Eighteen reasons why the city of New York should abandon its intention of establishing a bus route in Park Avenue are set forth in a report sent by Fisk & Roberts, consulting engineers, New York, to H. Gordon Duval, president of the Park Avenue Association, and made public recently.

The Board of Transportation has included a "Lafayette Street, Madison Avenue and Park Avenue" route in the proposed bus system for Manhattan, applications for a franchise for which are before the Board of Estimate. The report says that use of Park Avenue for a bus route is opposed by more than 99 per cent of 5,000 persons in the section canvassed. The engineers say:

> There is also a definite feeling on the part of residents that Park Avenue is already doing its share as a traffic artery. In addition to carrying a tremendous volume of vehicular traffic, it is also carrying under its surface the enormous passenger traffic of the New York Central and the New York, New Haven & Hartford Railroads.
>
> It must be admitted that in providing public transportation on any highway which previously has been without it, there will be resultant disadvantages, as well as the very evident advantages. It is a common occurrence for persons living directly on streets devoted primarily to residential purposes to object to bus operation. Such objectors cite as reasons for their opposition the noise of engine exhausts, particularly during sleeping hours; the poisonous and unpleasant fumes from these exhausts, and the accident hazard created by the operation of public vehicles on a fixed schedule which drivers are expected by their employers to adhere to.
>
> However, Park Avenue is not an ordinary residential street. Most Americans will call it the finest residential street in New York City. Most New Yorkers will argue that it is the finest residential street in America. It is unnecessary here to describe its character in any detail.

Other disadvantages that would result to residents of Park Avenue, summarized by the report, are additional vibration from heavy buses because of the railroad tunnel underneath, a great increase in traffic congestion, reduction of speed of all vehicular traffic, decreasing use of Park Avenue by private automobiles, the mixing of high speed automobile traffic with low speed omnibus traffic, and probable injury to near-by surface lines on Madison and Lexington Avenues, which might prevent their rehabilitation. The report adds:

> A large part of the present bus traffic on Fifth Avenue will be diverted to the proposed Park Avenue route. This will be especially true if the fare on the Park Avenue route is 5 cents, as proposed by some of the franchise applicants. The diversion of this traffic from Fifth Avenue to Park Avenue will be of little or no assistance in solving the city's transportation problem and might be detrimental to business interests on Fifth Avenue.

Another Buffalo Grant to E. M. Howe

The City Council of Buffalo, N. Y., has approved the application of Ernest M. Howe, Detroit, representing the Buffalo Motor Coach Corporation, for a franchise to operate buses on three local lines in the city of Buffalo at an 8-cent fare with free transfers to connecting bus lines. Following the approval of the plan by the City Council and the granting of a five-year franchise Mr. Howe informed Mayor Frank X. Schwab that immediately he would petition the New York State Public Service Commission for a certificate of convenience and necessity. He promised 25 buses would be in operation on the three routes within 60 days after the consent of the state utilities board has been obtained.

Mr. Howe's franchise runs for a period of five years and provides that if the city becomes empowered to operate municipal buses the three lines of the Buffalo Motor Coach Corporation can be taken over by the city on six months notice.

Opposition to the franchise was voiced by counsel for the International Railway and its subsidiary, the International Bus Corporation. The International Bus Corporation told the City Council it stood ready to give additional service over new routes under applications tabled since last spring.

Mr. Howe obtained a franchise from the Buffalo City Council a year ago to operate 5-cent buses over thirteen routes in the city, but approval never was obtained from the Public Service Commission as Mr. Howe and the American National Omnibus Corporation, New York, lacked $300,000 of the necessary $1,500,000 paid in capital on the last day allowed by the state utilities board to complete its financing and appear before the commission for a hearing on its application for a permit.

New Route Opened.—The Boston Elevated Railway, Boston, Mass., recently put in operation three new bus routes. These serve territory not previously reached by railway service.

Buses Between Aurora and Elgin.—The Aurora, Elgin & Fox River Electric Company, operating an interurban service from Aurora to Elgin, Ill., has been granted a permit to install buses between those two cities, on routes on both the east and west Fox River roads. The new system, it is said, will not interfere with the present interurban service, but will act as feeder to the interurban line and reach a territory not in the interurban field.

Financial and Corporate

St. Paul Seeks Suggestions

Earnings of Lines There Fall $485,000 Below Amount to Which Company Is Entitled

The St. Paul City Railway, St. Paul, Minn., has asked the St. Paul City Council for advice. Under a ruling of the Minnesota Railroad and Warehouse Commission the railway is allowed to make 7½ per cent upon its investment. An agreement is on file that earnings of the Twin City Motor Bus Company, a subsidiary of the Twin City Rapid Transit Company, the parent organization for both companies, above 7 per cent will be turned over to the railway. The earnings of the bus company upon preliminary report seem to fall below this figure. These are to be filed in detail soon. At any rate the earnings of the St. Paul City Railway are about $485,000 in 1926 below the earnings to which the company is entitled, or $715,000 instead of $1,200,000.

Two alternatives present themselves. One is an advance in the rate of fare from 8 cents cash or six tokens for 40 cents. The other is an amendment to the city charter which will relieve the company of certain charges, such as paving between the tracks, as suggested by the state commission, when the fare rate was announced. Such an amendment failed to pass at the November election.

A letter from Horace Lowry, president of the Twin City Rapid Transit Company, reads:

> On Jan. 1, 1926, under authority of the Minnesota Railroad and Warehouse Commission, there was put into effect in the city of St. Paul a railway rate of 8 cents cash with a token rate of six for 40 cents.
>
> During the year 1926 both Minneapolis and St. Paul agreed with the commission and the railways on the property values and the rate of return, and entered into stipulations to the commission and the courts, so this problem no longer confronts us.
>
> In its order the commission clearly states that unless St. Paul relieves the St. Paul City Railway of certain burdens of taxes, paving and special assessments it would be impossible for the property to earn a fair return on the established fair value of its property.
>
> The St. Paul City Council and taxing authorities have already relieved the company of overtaxation as suggested by the commission, but nothing else has been accomplished.
>
> At the November election there was submitted to the voters a charter amendment the purpose of which was to authorize the City Council to relieve the company of paving and certain other burdens, but this amendment was defeated because it was submitted at a general election instead of being made the subject of a special election at the general election, as we urged.
>
> This is proved by the fact that a substantial majority of those voting on the question voted in favor of adopting the amendment.
>
> There are other operating economies, some of which we have already suggested, which could be brought about by close co-operation between the company and the city.
>
> In its order the commission stated that it had reason to believe that the city of St. Paul would give serious consideration to the situation within a reasonable time, but a year has now elapsed.
>
> For your information, the 1926 operation of the St. Paul City Railway will be about as follows, although there may be some slight variation on account of the last part of the year being estimated (very closely, we believe):

Gross revenue	$4,592,000
Operating expenses, rentals, taxes, etc.	3,877,000
Available for return on the investment	$715,000

> The commission, the city and court agreed that the company was entitled to earn more than $1,200,000 in order to give the company a fair return on the value of its property. It is therefore obvious that the company will be short about $485,000 during 1926 from what it is entitled to earn.
>
> We wish to assure your honorable body that we want to do all in our power to avoid a higher rate of fare in St. Paul, but without your help and co-operation we cannot avoid it.
>
> We sincerely hope you will give this your early consideration, and advise us of your suggestions as to how the necessary reduction in expenses can be accomplished.

Deficit in Cincinnati Due to Buses

Operation of buses by the Cincinnati Street Railway, Cincinnati, Ohio, has resulted in a loss in the earnings of the company, according to a report embodying the December figures of the company, which Walter A. Draper, president, recently submitted to Edgar Dow Gilman, Public Utilities Director. During December the report shows that the total of revenue passengers reached its peak on electric cars for the year, but there was a loss of $15,754 in operation of buses. In view of the fact that there is only $420,837 in the fare control fund, and judging from the earnings of the company during the past year, car riders, according to Mr. Draper, cannot expect a reduction in the rate of fare for at least the next two or three years. The present cash fare is 10 cents, with tickets sold in strips of three for a quarter. Mr. Draper explained that operating expenses also reflected the large amount that is being expended by the company in connection with track reconstruction.

Detroit Wants to Know

Councilman Propounds Questions Calculated to Fix Relative Earning Power of Railway and Bus Lines—Mayor Comments on Terms of Contract Under Which City Purchased System

A REAUDIT of the books of the Department of Street Railways at Detroit, Mich., for the year ended June 30, 1926, was asked in a resolution introduced in the City Council on Jan. 11. Two audits have already been made, one by William M. Hauser, D.S.R. auditor, and one by Price, Waterhouse & Company, and the resolution providing for a reaudit is the result of the fact that the audits were about $1,000,000 apart. The D.S.R. auditor's report showed net earnings of about $500,000 for the system, while the other audit showed a deficit of several hundred thousand dollars.

The third audit, requested by a unanimous resolution of the Council, was opposed by Mayor Smith. He stated that it will do no good, because where the last audits differ is in depreciation charges. The Mayor further cited that the D.S.R., in assuming such a heavy interest and debt charge at the time of its purchase, did something that no private company has ever done.

Councilman Sastator, who introduced the resolution, cited that the City Charter provides that an unprejudiced audit of the books be made every year. He also prepared and submitted a list of nineteen questions relative to the municipal railway accounting methods, stating his belief that the railway lines are subsidizing the bus lines and that the cars, which carry the bulk of the passengers, are handicapped by the buses.

Among the questions propounded by Councilman Sastator and the data sought were the following:

> Is bus operation such that the lines meet the costs, or are they actually being subsidized by the trolley division?
>
> In bus data shown in monthly statements, are any costs included other than strictly maintenance and operating costs?
>
> Is there any distribution of charges to bus operation for erection of new garages, alteration of carhouse, rental of space and equipment at carhouses or the pro rata cost of time of D.S.R. executives, claims, equipment, auditing, fare inspection, etc.
>
> In what account is depreciation of bus equipment shown, and what is the rate on single-deck buses?
>
> Is it the opinion that the single-decker will be fit for operation beyond 75,000 miles, except at prohibitive costs?
>
> If not, what funds are available to replace the equipment?
>
> How much paving tax has been paid to the city by the bus division and how many miles has division operated to date?
>
> List number of buses, date placed in operation, total mileage to date and average miles a month for each vehicle, for last twelve months, or since going into service.
>
> List the individual bus routes, date installed, length of route, number of buses at peak, revenue, revenue per mile first three months of operation and same figure for three months ended October, 1926, total miles operated for first three months, and for three months ended October, 1926.
>
> Give the total number of bus claims filed against the department in the same period and claims allowed or litigation with amounts and names of plaintiffs. Show where this expense is represented in bus costs as printed in monthly statement, and where bus division is charged to build up its share of injuries and damage reserve.
>
> Give number of "dead" miles operated monthly on each bus route, and percentage this represents of total route operation.
>
> When were 50 double-deck Fageol coaches ordered?
>
> What was delivery date, and how many have been delivered?
>
> What funds are available to pay for these 50 coaches, other than money now in regular funded reserves of the trolley division, such as for injuries and damages reserve?
>
> Give the trolley car revenue for each month, on Woodward Avenue and Jefferson Avenue, before installation of single-deck buses on these lines, and trolley revenue for 30 days after, installation of single buses.
>
> Why is it not advantageous to keep bus costs entirely separate from trolley costs?
>
> Why have figures from each division merged in your general accounts?

The questions were asked by Mr. Sastator as a member of the body which approves or disapproves contracts for the purchase of buses and street cars, so he could vote in the future with the facts before him, he stated.

Mr. Hauser's report in reply to the questions shows a falling off in the earnings of the street cars on Woodward, Jefferson and Grand River lines from $401,443 in June, before bus lines were established on these streets, to $357,094 in August after they were established. The average daily income fell from $13,381 in June to $11,519 in August. He stated that coach operation is such that the lines as a whole meet the costs and they are not being subsidized by the street car rider.

The decrease in the average revenue per day on the three lines just mentioned, according to Mr. Hauser, cannot be attributed wholly to the installation of coach service on Jefferson, Grand River and Woodward Avenues. The general traffic was subject to a slump in August, 1926, compared with June, 1926. It is further cited that the competition between the D.S.R. facilities and those of the jitneys and the Detroit Motorbus Company was at its height. Arguments are presented in support of the view that none of such items as erection of garages, alterations to carhouses, and salaries of D.S.R. officials should be considered, and that none of the items should have been reflected in the bus operation cost figure.

Colorado Property to Be Sold

The Denver & Interurban Railroad, which for nineteen years operated between Denver and Boulder, Col., has been advertised for sale at auction. The auction is to be held at an old Interurban carhouse in Denver on Feb. 16 with John J. Morrisey, local attorney, special master in chancery. No upset price has been named for the property. The road is to be sold to satisfy a $1,250,000 claim covered by a mortgage in favor of the Guaranty Trust Company, New York, as trustee.

Readjustment Talk at Boston

Metropolitan Transit System Suggested as New Company to Succeed Boston Elevated

Many new plans and propositions are being developed for the future of the Boston Elevated Railway and are finding their way to the Massachusetts Legislature. The latest is a bill offered by Henry I. Harriman, chairman of the Metropolitan Planning Division, providing for the abolition of the Boston Elevated, the wiping out of its board of public trustees and the creation in its place of a new corporation to be known as the Metropolitan Transit System. This is the plan to which brief reference was made in ELECTRIC RAILWAY JOURNAL, Jan. 15, page 144.

Three public incorporators are to be appointed by the Governor, under the provisions of this bill, and they are to form the new company. The present Elevated Company is to sell its property to the new company and the new securities are to be 4½ per cent preferred stock and 5 per cent common stock. There is to be no money exchange in the transaction, for the road is to take one share of common stock at 5 per cent for one share of present common stock, which pays 6 per cent.

For the present first preferred stock, which pays 8 per cent, the new company would give new 4½ per cent preferred stock at $125; second preferred stock of the present company, paying 7 per cent, would be exchanged for the new 4½ per cent preferred at $110. The present special preferred stock would be converted into the new preferred at $105.

There is ample provision in the bill for non-assenting stockholders. The new arrangement would save $800,000 yearly in interest charges; of this sum the first $200,000 would be applied to a sinking fund for the purchase of preferred stock at par by the Commonwealth. The next $400,000 would be used to pay the present deficit to cities and towns which advanced money to the Elevated years ago, and the balance of $200,000 would be used to pay rental charges on new transit extensions.

Further, the bill provides for a 50-year extension of the public control, and during that period the state would acquire complete ownership of the corporation. The Supreme Judicial Court would be called upon to liquidate the present Boston Elevated Railway, winding up its affairs, and a board of trustees would be appointed by the Governor to operate the road, its chairman to receive $15,000 a year.

Foreclosure Sale Postponed.—Sale of the Second Avenue Railroad, New York, under foreclosure has been postponed to June 23, according to Charles E. Chalmers, receiver for the company. The sale was set originally for Jan. 13. The terms of the reorganization were reviewed in the ELECTRIC RAILWAY JOURNAL for Dec. 18, page 1115.

New Director Elected.—H. Fairfield was elected a director of the Homestead & Mifflin Street Railway, Homestead, Pa., on Jan. 11.

Bonds Being Paid Off.—The $330,000 of 7 per cent bonds of the Springfield & Eastern Street Railway, Springfield, Mass., due Jan. 1, 1927, are being paid off at the office of the Springfield Safe Deposit & Trust Company. The Springfield & Eastern Street Railway is a subsidiary of the Springfield Railway.

Cash Fares Lower.—The Binghamton Railway, Binghamton, N. Y., carried a total of 13,369,577 revenue passengers in 1926. This shows a decrease of 1,001,582 cash fares since the close of 1925, when 14,371,159 passengers paid to ride on the cars. In spite of these figures the car-miles for 1926 were 2,214,850, compared with 2,216,881 for 1925, over a track mileage of approximately 50 for both years.

Traffic Increases.—A slight increase in the number of passengers carried by the United Railways & Electric Company, Baltimore, Md., for the first eleven months of 1926 is noted in comparison with similar period a year before. For the eleven months of the year just ended 205,273,813 passengers were carried, against 204,341,300 foi the eleven months period ended November, 1925.

Net Income Increases.—For the six months period ended Dec. 31, 1926, the total operating revenues of the Brooklyn-Manhattan Transit Corporation and affiliated companies, Brooklyn, N. Y., was $23,329,938, against $22,463,954 in 1925. Total operating expenses increased from $14,546,414 for the six months period of 1925 to $14,967,150 in 1926. After the consideration of income deductions a net income of $3,310,883, remained for the six months period ended Dec. 31, 1926, against $2,994,524 for a similar period in 1925.

Conspectus of Indexes for January, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares* 1913 = 4.84	Jan. 1927 **7.42**	Dec. 1926 **7.42**	Jan. 1926 **7.32**	Nov. 1926 **7.42**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Jan. 1927 **156.0**	Dec. 1926 **159.2**	Jan. 1926 **154.3**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	Jan 1927 **226.6**	Dec. 1926 **226.3**	Jan. 1926 **223.8**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Jan. 1927 **203.5**	Dec. 1926 **203.2**	Jan. 1926 **202.2**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Jan. 1927 **211.5**	Dec. 1926 **210.8**	Jan. 1926 **207.2**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Dce. 1926 **147.2**	Nov. 1926 **148.1**	Dec. 1925 **156.2**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Jan. 1 1927 **12.82**	Dec. 1 1926 **12.78**	Dec. 1 1926 **14.01**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Dec. 1926 **161.8**	Nov. 1926 **161.6**	Dec. 1925 **165.5**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Dec. 1926 **168.4**	Nov. 1926 **168.2**	Dec. 1925 **171.4**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Dec 31 1926 **3.961**	Nov. 30 1926 **3.807**	Dec. 31 1925 **5.033**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Dec. 1926 **19.76**	Nov. 1926 **18.24**	Dec. 1925 **20.38**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Dec. 1926 **1987** **91.70**	Nov. 1926 **1614** **60.31**	Dec. 1925 **1628** **43 11**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Personal Items

Schenectady Railway's New Head

Steam Railroad Official Who Started His Career in 1878 Succeeds the Late E. M. Walker

James H. Hustis, former president of the Boston & Maine Railroad and for a lifetime connected with railroads and electric railways in various capacities, has been called from a year's retirement to succeed the late Edwin M. Walker as president of the Schenectady Railway, Schenectady, N. Y. Mr. Hustis took office on Jan. 8. He brings with him a wealth of experience in railroading, and it is believed by the officials of the New York Central Railroad and the Delaware & Hudson Company, joint owners of the electric railway, that this background fits him excellently for the post at Schenectady.

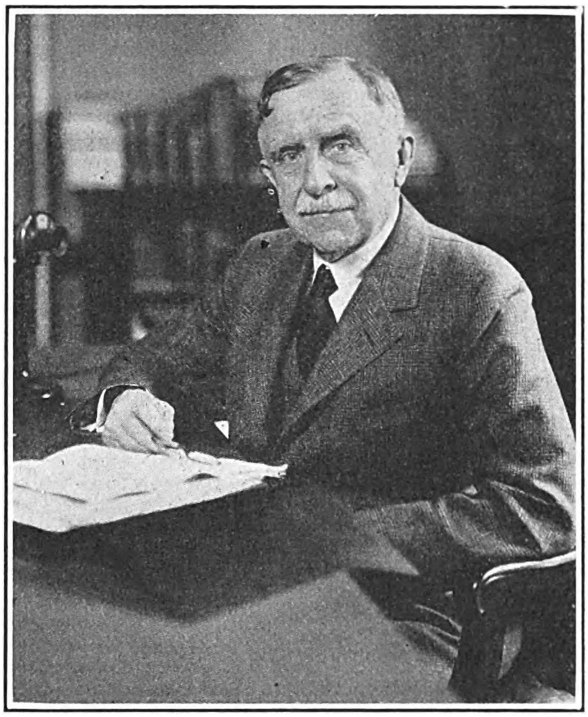
The shocking suddenness of Mr. Walker's death on Dec. 30, caused by carbon monoxide poisoning in a closed garage, and the necessity of finding a successor in a short time, gave Mr. Hustis little opportunity to formulate plans or policies for his administration. At present he is making an intensive study of the situation. Aside from a few generalities in regard to electric railway conditions in the city of Schenectady he was unwilling to discuss his future work.

He said quite frankly that he had no knowledge of the physical make-up of the Schenectady property or of its particular problems or needs. On that account he was unable to discuss the subject of the Schenectady lines in any detail. He did say, however, that on the way to Schenectady he had an opportunity to look over the balance sheet of the property and to study some of the figures covering the results of operation.

"My entire life," said Mr. Hustis, "had been spent in the transportation business until last spring, when I retired from the presidency of the Boston & Maine Railroad. Transportation, whether steam or electric, is, and, for that matter, has been, an essential public service. This country is what it is because of its unequaled transportation facilities. For some years, due to causes that do not now need to be discussed, a feeling of antipathy existed between owners and users. This feeling was not confined to any locality or section, but was quite general. Fortunately, that feeling is gradually disappearing, at least so far as steam railroads are concerned, with the result that 1926 was, generally speaking, a prosperous year for railroads and a prosperous year for the users of the roads.

"The stocks of merchants and manufacturers, which represent a vast sum running into billions, was never so low as last year, due to the ability of railroads to make prompt deliveries. Similarly in the electric railway field the public is recognizing that the electric railways are rendering an essential public service and that good service is essential to any important community, regardless of the great increase in the use of motor cars."

On his retirement from the Boston & Maine Railroad a year ago Mr. Hustis decided that he needed a rest and made a tour of Europe. After his return he traveled extensively in the United States, and at the time of his appointment to the presidency of the Schenectady Railway he was considering a pleasure trip to California or Florida.


J. H. Hustis

Mr. Hustis entered railroading in the office of the general superintendent of the New York Central Railroad in 1878. His first executive appointment came in 1891, when he was made trainmaster of the Harlem division. By 1900 he had worked up to the superintendentship. For the next two years he was superintendent of the River division, but in 1903 went to the Rome, Watertown and Ogdensburg division. In 1907 he was appointed general superintendent of the Western division.

During the year 1907-1911 he held the position of assistant general manager of the New York Central in charge of the Boston & Albany, and in 1911 he was promoted to vice-president with the same charge. During the year 1913-1914 he was made president of the New York, New Haven & Hartford and on Aug. 15, 1914, was elected president of the Boston & Maine Railroad.

Mr. Hustis was born in New York City on Jan. 11, 1864.

California Commission Reorganizes—Personnel Changes

Upon its recent reorganization the California Railroad Commission, at the suggestion of Commissioner Harley W. Brundige, who has served as president of the commission during the last two years, started a new policy of rotating the presidency of the commission among the commissioners in the order of their seniority. It elected Commissioner Ezra W. Decoto as president for the year 1927. President Decoto was appointed to the commission in January, 1925, previous to which he served as District Attorney of Alameda County for six years. He has been active in civic affairs in the state and in Alameda County for many years, and has had a thorough training in public utility matters.

President Brundige, the retiring president, has served the commission in that capacity four years, having been president during 1921-22, and also during 1925-26. The commission reorganized, following the reappointment to office of Commissioners Brundige and Whitsell, whose terms expired Dec. 31, 1926. Both were reappointed by Governor Richardson for the full term.

In carrying out the new plan of rotating the presidency, Commissioner Leon O. Whitsell, who is next to President Decoto in seniority, will be elected as president during 1928, and Commissioner S. Louttit will serve as president during 1929.

In adopting this policy the commission follows the plan of the Interstate Commerce Commission under which every commissioner who serves a term will have acted as chairman of the commission for one year. The duties and responsibilities of the Railroad Commission have increased so rapidly in recent years and the volume of the work handled by the commission has grown so large that the office of president throws upon the incumbent a tremendous amount of added work and responsibility. It is the unanimous opinion of the commission that this work and responsibility should be shared by every member of the commission.

D. L. Fennell Elected to Highway Safety Association

D. L. Fennell, general superintendent of transportation of the Kansas City Public Service Company, Kansas City, Mo., has been elected a member of the board of governors of the Missouri Street and Highway Safety Association. Mr. Fennell's appointment to the directing group of this state body constitutes fitting recognition of his activity and interest in promoting street and highway safety. It marks another step in the country-wide movement by transportation officials to co-operate in and identify themselves with the activities of public bodies working to better traffic regulation and promote public safety.

Changes on North Shore Line

C. Edward Thorney, former general passenger agent of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has assumed his duties as assistant to Hal M. Lytle, vice-president in charge of public relations, to which position he was recently appointed. R. S. Ames, formerly assistant general passenger agent at Milwaukee, succeeds Mr. Thorney in the traffic department. Both Mr. Thorney and Mr. Ames are experienced railroad men, having served in various capacities with other railroad companies before joining the North Shore Line.

Mr. Thorney was made general agent of the railroad at Milwaukee in November, 1925. Shortly after this he was appointed secretary of the company's Better Business Campaign, in which capacity he served until several months ago, when he was appointed to the position he held at the time of his most recent promotion.

Mr. Ames entered the service of the North Shore Line as general agent, passenger department, in Chicago in January, 1926. He was appointed to succeed Mr. Thorney as assistant general passenger agent at Milwaukee upon the latter's appointment to the Chicago office.

Indiana Commission Changes Announced

Formal appointment of Reid McCain of Delphi, Ind., as secretary of the Indiana Public Service Commission was announced on Jan. 1. Mr. McCain notified the commission of his acceptance and will take over his new duties immediately. He is a graduate of Franklin College and served two years as surveyor of Carroll County.

Appointment of Webb Gilbert as acting chief accountant to succeed John S. Powell, who resigned, also was announced by the commission.

A. P. Lewis, formerly connected with the Wichita Railway & Light Company, Wichita, Kan., has been named general superintendent of the Rockford, Beloit & Janesville Railway, Rockford, Ill., recently purchased by Milton Ellis, president of the Beloit Traction Company.

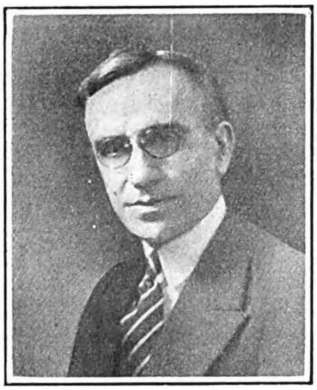
Judge L. D. Hill of Sparta, White County, Tenn., is now a member of the Tennessee Railroad and Public Utilities Commission. He was named in the November election as a Democrat and succeeded Julian H. Campbell, Republican, who received an appointment as United States Commissioner at Nashville.

A. F. Davey, manager of the Wisconsin Public Service Corporation's properties at Sheboygan, Wis., has been named manager of the Sheboygan-Manitowoc division of the company, under the recent plan placed into effect in a redistricting of the operating divisions. Mr. Davey will have jurisdiction over the operation of the electric railway and bus operations at Manitowoc and Two Rivers.

A. L. Fischer Made Purchasing Agent at Cincinnati

A. L. Fischer, assistant purchasing agent of the Cincinnati Street Railway, Cincinnati, Ohio, since its reorganization in November, 1925, has been appointed purchasing agent for the company. He had served the Cincinnati Traction Company as assistant purchasing agent since 1917, and when the Cincinnati Street Railway took over the operation of the street railway system last year he was retained in the same capacity.

Mr. Fischer, a native of Cincinnati, received the degree of bachelor of arts in 1896 at St. Xavier College at Cincinnati, and the degree of master of arts the following year from the same institution. He entered electric railway work in 1903 in the transportation department of the Cincinnati Traction Company. Mr. Fischer is a member of the committee of purchases and stores of the American Electric Railway Association.


© Bachrach

A. L. Fischer

The Glasgow Manager's Retirement

In accordance with the arrangement already reported, James Dalrymple retired from the post of general manager of the Glasgow Corporation Tramways on Dec. 31. He received various gifts from colleagues. Before he left he made an address to the staff of the department, in the course of which he said:

> It is now 22 years since I was appointed general manager. These years have been very strenuous, but the work has been extremely interesting. I have been looking into our records and I find that there are 66 still on the staff who joined the department with me in 1894, and there are 1,014 still in the service who were here when I became general manager in 1904.
>
> I leave the service with very great regret, as I have always been proud of being a member of the Glasgow tramways staff. You have made the Glasgow tramway system the envy of the whole tramway world. I thank you very sincerely for the loyal support you have given me during all these years, and I trust that, notwithstanding many difficulties, the Glasgow tramways will continue to flourish.

Mr. Dalrymple has received an offer by cable of the post of tramway adviser to the Johannesburg Corporation, South Africa. He has replied stating that he is willing to accept after the completion of his São Paulo engagement. The latter, it may be recalled, is for three months and is also an engagement in an advisory capacity.

On Dec. 22 the Glasgow Town Council accepted Mr. Dalrymple's resignation of the post of general manager of the tramways under circumstances which have already been outlined in these pages. The Council also adopted a recommendation by a committee that Mr. Dalrymple should be granted a retiring allowance of £832 11s. 2d. a year, being one-half of his average salary for the last seven years. This is the usual superannuation arrangement.

Obituary

M. H. Bronsdon

M. H. Bronsdon, Commissioner of Public Works in Providence, R. I., since 1924 and nationally known as an electric railway engineer, died on Jan. 15 in San Diego, Cal. Although already well known as a builder and operating engineer of electric railway lines, Mr. Bronsdon achieved his greatest prominence through his participation in the speedy rebuilding of the local railway lines in San Francisco following the earthquake and fire in 1906 as well as for his service as chief engineer of the Providence, R. I., electric railway system, with which he was connected for the greater part of the time from 1907 to 1915.

Mr. Bronsdon was a native of San Francisco. His father constructed the first electric railway between Boston and Charlestown and also built the first electric railway on the Pacific Coast. It was on the coast that he had his first experience in engineering work. This was during the construction of the cable road in Los Angeles. In 1889 he became superintendent of the Providence Cable Tramway. He later was chief engineer at the Eddy Street power plant in Providence, having charge of the installation there. He later went to Duluth as designing and construction engineer of the Duluth-Superior Traction Company, and was afterward appointed engineer for the Old Colony Street Railway, Boston, Mass.

His next engagement was with the United Railroads, San Francisco, where he remained until March, 1907. He next became chief engineer of the Rhode Island Company, at that time operating the electric railways in Providence, R. I. For five years he continued in that post and then resigned to return to his home in California. Two years later he returned to the employ of the company at Providence, but about a year after this he retired from the company to accept appointment to the newly created office of deputy commissioner of public works of the city of Providence. His acceptance of this office marked the end of his active connection with electric railway affairs.

Clifton Colburn, treasurer and an organizer of the Nahant & Lynn Street Railway, Lynn, Mass., died Jan. 5. He was connected with the Nahant & Lynn Street Railway since its organization.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Fifty Gas-Electric Coaches Being Delivered to Detroit Railways

Complete delivery of 50 a.c.f. gas-electric double-deck coaches for the Department of Street Railways of the City of Detroit is expected by Jan. 31.

These coaches embody several unusual features, including equipment for either one-man or two-man operation and a complete inclosed stairway and upper deck, with an over-all height of only 12 ft. 8 in. They are the first of a recently announced line built by the American Car & Foundry Motors Company to be put in service. A six-cylinder, 90-hp. Hall-Scott engine, with 4¼-in. bore and 5½-in. stroke, comprises the power equipment. The electric drive, made by the General Electric Company, is of the type used in previous gas-electric buses. It consists of a generator connected directly to the engine, which produces current to operate the two series-wound electric motors, one of which is geared to each of the rear wheels. Westinghouse air brakes operating low carbon shoes against high carbon drums are provided on all four wheels. Electric braking also is provided by introducing a resistance grid into the circuits with the current flowing in reverse.

One of the 50 Gas-Electric Coaches Which Are Being Delivered to the Detroit Street Railway System. They Are Designed for One or Two-Man Operation

Front and rear passenger doors are controlled independently by pneumatic door engines, making it possible for the driver to operate the vehicle without the aid of a conductor. Both front and rear doors have treadle controls. They are also fitted with an outside conductor's air valve so the bus may be loaded from both ends at terminal or congestion points.

The frame is made from heat-treated alloy steel; the side rail sections having the maximum dimensions of 11-in. web 3-in. flange. The material is ¼ in. thick and the frame is reinforced for several feet through the section of maximum stress by pressing a $\frac{3}{16}$ in. reinforcement into the main rail, giving a maximum rail thickness of $\frac{7}{16}$ in. Pressed-steed channel cross-members are used to reinforce the frame. The front springs are 4 in. x 49 in., and the rear springs 5 in. x 64 in. Rear springs are equipped with bumper springs whose tips contract progressively under deflection. It is claimed that the unusual length and width of these springs gives a riding quality which is much better than has heretofore been achieved in double-deck coaches.

Each coach has 60 seats, 27 passengers being accommodated on the lower deck in Brill type, leather-upholstered seats which are provided with spring units in the bottom and back. On the upper deck 28 out of the 33 seats face outward over the monitor. Two seats are placed at the forward end of the monitor section, and three passengers can be seated in folding taxi chairs.

By economical use of space, the builders have obtained 6 ft. 4 in. headroom in the lower deck and 5 ft. 10 in. on the upper level. Ample lighting is supplied by nineteen 21 cp. lamps, operated from a double battery of six cells each built up with 21 plates.

Cars Being Rebuilt for One-Man Operation at Hampton, Va.

An extensive reconstruction and painting program has been started by the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va. The platforms of 45 two-man double-truck cars are being remodeled to provide for one-man operation. These cars are to be equipped with all of the modern National Pneumatic and Safety Car devices. After the reconstruction work is completed each car will be painted with the standard Fitkin combination of colors. When completed the property will be operating on a 100 per cent one-man basis.

New Financial Interests Back Brown Boveri

Action of the stockholders of the American Brown Boveri Electric Corporation on Jan. 5 in electing to the directorate representatives of Blair & Company, Inc., the Central Union Trust Company, the Equitable Trust Company and Curtis & Sanger is taken as indicative of new and important financial interests having become identified with the corporation. The new board consists of fourteen members, as follows:

Clifford Bucknam, Pynchon & Company; James I. Bush, vice-president Equitable Trust Company; Allen Curtis, Curtis & Sanger, Boston; William M. Flook, representing the Anthony N. Brady Estate; Edward N. Goodwin, representing Brown, Boveri & Company, Ltd., Switzerland; William V. Griffin, representing the Anthony N. Brady Estate; James Imbrie, president Imbrie & Company; William F. Ingold, Pynchon & Company; Henry Lockhart, Jr., vice-president Blair & Company, Inc.; John J. Rudolf, A. Iselin & Company; Theodore G. Smith, vice-president Central Union Trust Company; Elisha Walker, chairman of the board and president of Blair & Company, Inc.; Frank R. Warton, formerly vice-president of the Allied Packers Company, and Laurence R. Wilder, president American Brown Boveri Electric Corporation.

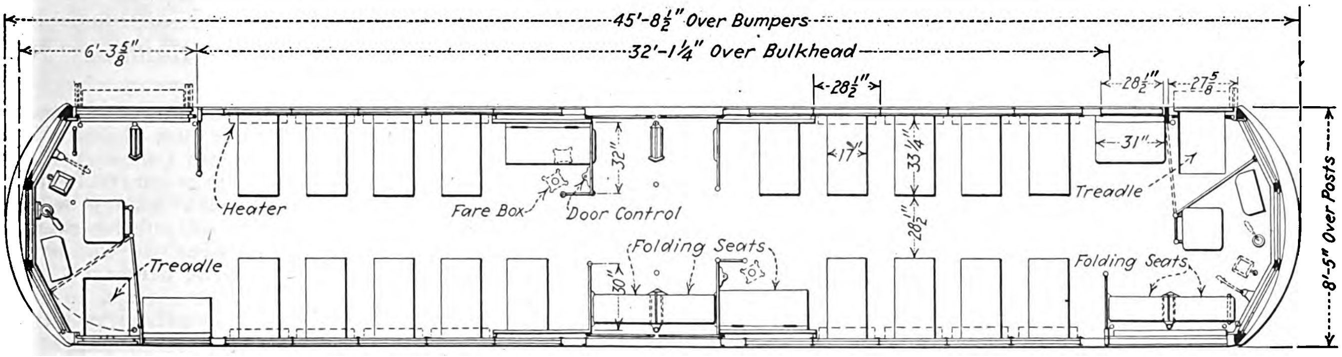
At the same meeting the following officers for the corporation were elected: Laurence R. Wilder, president; Clinton L. Bardo, Theodore Boveri, W. G. Groesbeck, Earl G. Hines and Frank R. Warton, vice-presidents; Norman R. Parker, comptroller, and J. T. Wickersham, secretary and treasurer.

Theodore Boveri, the son of the late Walter Boveri, one of the founders of Brown, Boveri & Company, Ltd., was for many years responsible for design and manufacture in the Baden, Switzerland, works of the company. His election as vice-president of the American Brown Boveri Electric Corporation in charge of engineering cements the working relations betwen the two interests.

New Standards Will Improve Lumber Trade

"Lumber stocks are as low as at any time in recent years," according to Wilson Compton, secretary and manager National Lumber Manufacturers Association. In spite of this Mr. Compton sees a bright outlook for 1927.

Writing in the *National Lumber Bulletin* Mr. Compton states that the national lumber trade extension program is not yet under way, but it is now expected to be on a scale of a minimum



Plan of Double-Truck Cars that Have Met with Much Favor in Dallas

of $1,000,000 a year for five years and will doubtless start during 1927.

"The consciousness of the lumber industry that it has at least reached such a degree of commercial intelligence and discipline that it is willing to inaugurate a great campaign for lumber is having an encouraging effect. The increasing observance and practice of American standards for lumber has paved the way for this campaign. The industry has put the manufacture, grading and merchandising of soft wood lumber, irrespective of species or region, upon a uniform basis, fair to the consumer, the distributor and producer. They indicate the dividing line between lumber manufactured from good timber, properly graded and sold for uses for which it is best fitted and lumber cut from inferior timber, roughly milled and poorly graded if at all."

New Cars Meeting with Good Response in Dallas

In May, 1926, an order was placed with the American Car Company, St. Louis, Mo., for 30 front-entrance, center-exit, double-truck cars to be used for city service on the Dallas Railway, Dallas, Tex. Delivery followed in approximately three months time, and since then the cars have been in regular operation, receiving very favorable comment from patrons of the company. They will accommodate 50 seated passengers, the front section being set aside for white passengers, while colored patrons use the rear. Treadle exits are provided at each end of the car.

The principal specifications are as shown in the following:

Bolster centers, length	26 ft. 11½ in.
Length over all	45 ft. 8½ in.
Truck wheelbase	5 ft. 1½ in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	10 ft. 7½ in.
Body	All steel
Interior trim	Mahogany
Roof	Arch
Air brakes	General Electric
Armature bearings	Sleeve
Bumpers	4-in. channel
Car signal system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	Brill
Compressors	General Electric
Conduits and junction boxes	Fabric duck
Control	K35-JJ, double end
Curtain fixtures	Curtain Supply Co.
Curtain material	Wyandasote DC 85-77-1
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Energy-saving device	Economy meters
Fare boxes	Johnson
Fenders or wheelguards	American Car Co.
Finish	R. F. Johnson's Krakno
Gears and pinions	General Electric
Hand brakes	American Car Co., drop handles
Heater equipment	16 Consolidated Car Heating Co., truss plank
Headlights	"Golden Glow" SM-95
Journal bearings	Brill plain
Journal boxes	General Electric
Lightning arresters	General Electric
Motors	Four GE-265-A, inside hung
Sanders	Nichols-Lintern
Sash and fixtures	Curtain Supply Co.
Seats	Brill "Winner"
Seating material	Wood slats
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	U. S. No. 13
Trolley wheels	U. S.
Trucks	Brill 177-E-1
Ventilators	Eight Utility
Wheels	Rolled steel, 26 in.

Safety Council's Calendar in Mails

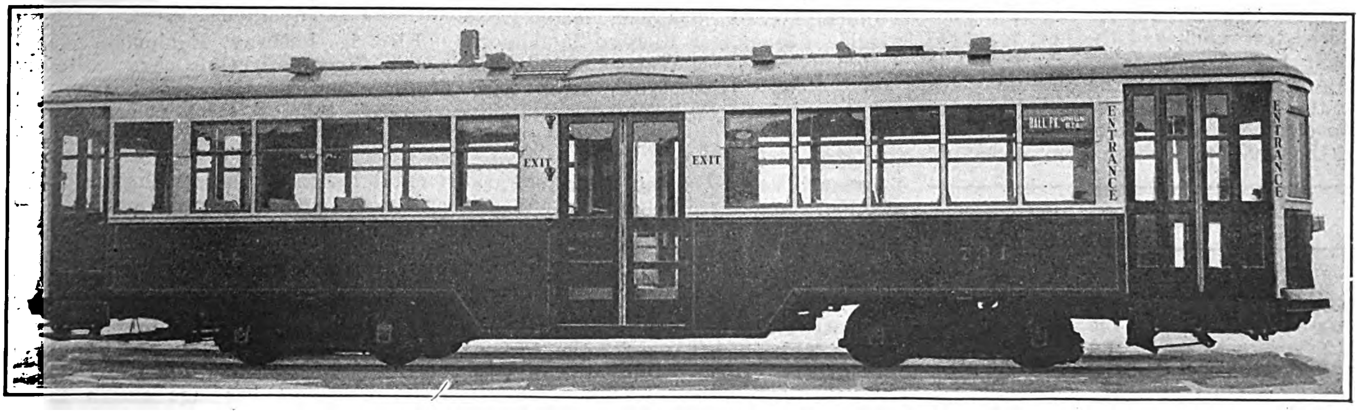
Suitable pictures and text characterize the 1927 calendar issued by the National Safety Council, Chicago, Ill. As usual, the pictorial features are about equally divided by the home and the factory. Special stress is laid in the text on the prevention of colds, local infections, heart disease, Bright's disease, headaches and the contagious diseases of childhood. Care of the eyes also is stressed.

Giant Order for Rectifiers Placed by Connecticut Company

The Connecticut Company has arranged for the purchase of mercury-arc rectifiers and all auxiliary equipment for its Bridgeport and Stratford 600-volt traction service substations. Orders for this material were placed with the American Brown Boveri Electric Corporation recently and were brought about by the decision of the company to shut down its power stations and secure energy from the New York, New Haven & Hartford Railroad, which operates an 11,000-volt, single-phase railroad between New York City and New Haven, Conn.

Installation at Bridgeport will comprise five manually controlled units, aggregating 6,000 kw. capacity. This is the largest mercury-arc rectifier installation both in number of units and total capacity in the United States. The Stratford substation will employ two full automatic units toaling 2,400 kw. capacity. A unique feature of this project is that all equipment is designed for operation at any of the following a.c. supplies: 13,900 volts, 60 cycles; 11,400 volts, 25 cycles; 6,600 volts, 60 cycles; and that the shifting from one to another may be accomplished with no appreciable equipment change.

It is claimed that the selection of this equipment has many advantages in that operating flexibility is provided without the heavy equipment replacement costs which would be necessary were other types of converting apparatus chosen; high efficiency over the entire working range characteristic of this type of conversion; and the economic light construction of substations is permitted by the low-weight, vibrationless equipment.



A Snappy Exterior Which Is Typical of the New Rolling Stock Delivered to Dallas Railway

Larger Buses in 1927 Forecast

In the opinion of Roy A. Hauser, manager bus department Mack Trucks, Inc., "the trend of bus development seems to be toward larger and more luxurious vehicles. With many of the smaller operators who were not financially able to take the risk of feeling the public's pulse retiring from the field, this is quite natural," said Mr. Hauser. "The big minds behind transportation systems have this courage, backed by financial ability; it is only natural, therefore, that the primary law of transportation, to the effect that cost per unit decreases with increase in number of units carried per vehicle, should assert itself."

Capper-Kelley Bill Denied Further Hearing

According to latest advices from Washington the Capper-Kelley bill, designed to permit the manufacturers of branded products to fix the resale price, has been denied further consideration by the committee on interstate and foreign commerce. "There is no probability," says the Washington report, "that anything further will be done on the bill at this session of Congress. While the measure has been strongly supported and has created considerable controversy for more than ten years, it has made no legislative progress in that time."

Miami Causeway Tracks Nearly Completed

Miami Beach Railway, Miami, Fla., through its president, A. L. Reynolds, announces completion of the double-track reconstruction work over the causeway from Miami to the plant of the Miami Beach Railway Company, east of Star Island. The remaining section of track covering the distance from the plant to the Miami Chamber of Commerce Building will be in operation in a short time. This reconstruction work was necessitated by the recent hurricane damage.

New York Car Wheel Company Disposes of Hammond Plant

The Hammond plant of the New York Car Wheel Company of Indiana has been purchased by the Southern Car Wheel Company of Pittsburgh, which is controlled by the Mellon interests. Negotiations for the sale were closed last week and the new management has already taken charge. The sale does not affect the Buffalo plant of the New York Car Wheel Company. No changes in the executive personnel of the wheel plant have been made.

Rolling Stock

Twin City Rapid Transit Co., Minneapolis, is including in its street railway expansion program the purchase of 25 new street cars of the noiseless type to cost $155,000. It is understood that the new equipment will be operated both in St. Paul and Minneapolis.

Metal, Coal and Material Prices

Metals—New York	Jan. 18, 1927
Copper, electrolytic, cents per lb	13.025
Copper wire, cents per lb	15.25
Lead, cents per lb	7.63
Zinc, cents per lb	6.88
Tin, Straits, cents per lb	66.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.325
Somerset mine run, Boston, net tons	2.575
Pittsburgh mine run, Pittsburgh, net tons	2.125
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N. Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.00
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.81

Track and Line

Georgia Railway & Power Company was recently granted permission by the Council of Atlanta, Ga., to lay its tracks on Bell Street, thus connecting the Decatur and Hunter Streets lines. With this connection the company plans to improve service on its Soldiers' Home-English Avenue line, which is now compelled to operate in both directions by a single track on Grant Street, a thoroughfare that is not wide enough for a double-track line.

Trade Notes

Westinghouse Electric & Manufacturing Company has appointed James A. Davies general superintendent of the South Philadelphia Works. The promotion was announced by H. T. Herr, vice-president in charge of operations, and was effective as of Jan. 7. Mr. Davies, who has been assistant general superintendent for the past eight years, was appointed to fill the position made vacant by the death, at Atlantic City, of H. M. Giles. The new general superintendent has a service record of seventeen years in the employ of the Westinghouse organization.

National Pneumatic Company, New York City, manufacturer of door and step controlling mechanisms for street railway cars, will occupy quarters in the Graybar Building, which it is expected will be ready for occupancy April 1.

Frank Metzger, manager of sales of the Standard Steel Works Company, Philadelphia, Pa., has been elected vice-president to succeed Richard Sanderson, resigned. R. Nevin Watts succeeds Mr. Metzger as manager of sales, with headquarters at Philadelphia.

J. D. Elsom for twelve years with the Economy Electric Devices Company, will represent the Johnson Fare Company in sales in the Central Western states. Mr. Elsom has formed the Illinois Motive Equipment Company, with headquarters in the Pure Oil Building, Chicago.

Armco Culvert Manufacturers' Association is the new name for the Armco Culvert and Flume Manufacturers' Association of Middletown, Ohio, effective Jan. 1.

Shops and Buildings

Portland Electric Power Company, Portland, Ore., has just placed a contract with the Austin Company, Cleveland, Ohio, for a large garage to house its trucks. The new garage will be 100 ft. wide with all interior columns eliminated. The structure will be 240 ft. long with a clear height of 14 ft. The building will be modern in every respect. Usually industrial as well as other construction is of timber in the Northwest. In this case 120 tons of structural steel will be employed. All sash will be of the modern steel type with ventilating sections. Special repair and greasing pits will be installed, having a newly developed ventilating and lighting system which has been designed by Austin engineers.

Indiana Service Corporation, Fort Wayne, Ind., is drawing up preliminary plans for the construction of an office building and terminal station at Fort Wayne, Ind, to cost $250,000.

New Advertising Literature

Timken Roller Bearing Company, Canton, Ohio, is presenting in booklet form "Recent Developments in the Application of Tapered Roller Bearings in Machine Tools," a study recently read before the machine tool section of the A.S.M.E. by S. M. Weckstien, M. E., industrial equipment engineer of the company. Comprehensive text matter and illustrations make this study a valuable addition to the manufacturer's library. Copies of the paper may be obtained by addressing the industrial equipment division of the company.

D. P. Frampton & Company, Pittsburgh, Pa., has just issued an attractive bulletin outlining the Frampton tie plugs.

Driver-Harris Company, maker of special alloys, Harrison, N. J., is now distributing a single-month calendar for the New Year, which advertises their Nichrome wire. The calendar is decorated with a humorous drawing which drives home the advertising thought.

Carnegie Library, Pittsburgh, Pa., has issued a bibliography on manganese steel, which was assembled by E. H. McClelland and Victor S. Polansky. The bibliography is in booklet form and has a preface by Sir Robert Hadfield, the inventor of manganese steel.

Electric Railway Equipment Company, Cincinnati, Ohio, has issued a leaflet listing the advantages of "Elreco" tubular steel poles. These poles fulfill a three or fourfold purpose in supporting trolley span wires, ornamental lighting brackets, lighting circuit wires, and even traffic signals.

Hoyt Metal Co., St. Louis Mo., has issued a pamphlet giving complete babbitt metal data. It contains much information of value to users of babbitt metal, embodying as it does sections dealing with the selection and handling of the metal, considerations in the design of babbitt bearings and a table giving results of laboratory tests.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, January 29, 1927 *Number* 5

Not Unfriendly, Merely Indifferent

WHETHER or not service is restored on the Grand Rapids, Holland & Chicago Railroad between Grand Rapids and Jenison, a distance of 8 miles, the 30,000 people along the route now know the value of reliable interurban service. Long since they had come to take the operation of the road as a fact. They were warned that their indifference and the indifference of others along the rest of the route of the road was driving the property into a position where eventually operation must be abandoned, but the supplications of the management meant little to them. The matter was not one for them to worry about; no, indeed.

The inevitable happened. Now these people are engaged in a belated effort to save at least a part of the road. Meetings have been called and there has been much weeping and wailing and gnashing of teeth. Buses have been installed in a partial effort to supply the present need, but so far they do not seem to fill the gap which withdrawal of the railway service has left.

This case is very much like that of the Dayton, Covington & Piqua Traction Company in Ohio. Lament there came too late, also. In fact, it was a pitiful picture of loss that one of the patrons of this line painted in a letter to one of the local papers. In the cases of both of these roads people set their clocks by the cars. They started work and quit work at their going and coming. They lay in bed on the stormy and sleety mornings while the freight crews of the interurbans stopped and picked up the milk in the early hours where not so many years before they had to hitch up Dobbin and drive into town. They got their morning and evening papers by interurban. If they wanted an article in an emergency they called by telephone and the interurban did the rest.

In recent years some of the needs of the patrons and former patrons of these lines have been supplied by their own private cars. But not all families have cars. Moreover, not all private cars are available at all times. These and a lot of other things the residents overlooked. They were not particularly unfriendly to the interurban. They were merely indifferent. Now that their indifference has resulted in the withdrawal of service they had come to accept as a fact, without any thought of responsibility on their part, they have grown alarmed.

It is getting to be an old story, this. In fact, these cases would not be worth dilating upon were it not for the warning which they carry to communities elsewhere of the fate that impends for some of them if they do not come quickly to realize that there are some things which are well nigh indispensable. This is meant particularly for the responsible business men, to whom the account elsewhere in this issue of the stagnation in building operations and the loss in real estate values that has followed the Grand Rapids suspension should serve as a warning. It does not mean that the territory served by these lines in the past and the residents of that territory have suffered irreparable injury. That would, perhaps, be saying too much. But it does mean that they have suffered needlessly because they had come to accept as a fact a service which was valuable to them, and had remained deaf to all efforts to enlist their interest and co-operation in meeting the impossible operating situation encountered by the railway. It is high time that business men of the country awaken to a full realization of how much their own interests are dependent on the survival and development of organized and permanent transportation service.

Newspaper Publicity Getting Demands the Right Methods

IF THE Pittsburgh Railways' "Ride the Trolley Week" did nothing else but prove that good publicity copy is news, then all the labor connected with its campaign was not in vain. That this utility secured newspaper co-operation to the extent of ten pages of front-page text, which at inside display rates would have cost $6,000, is indisputable proof that its campaign was for the good of the community.

Those who doubt this statement are invited to try their luck with that greatest of all cynics the news editor of a daily paper. That this gentleman is a cynic and not a lunatic is due to marvelous self-control, for no one from Dan to Beersheba is called upon to consume as much blah in the guise of philanthropic and altruistic gestures as he who presides over the "city desk."

If, for example, the Prince of Wales expresses a strong preference for button shoes, this gentle cynic is supposed to believe that the publicity agent of the Amalgamated Button-Hook Corporation is his star reporter. So on *ad libitum, ad infinitum.*

Taking into account this preamble, an examination of the Pittsburgh Railways' publicity approach is of value to the entire electric railway field. Apparently it was based on that fundamental factor of all amicable relations—in short, reciprocity. For example, in connection with a double issue of the company's house organ, *Transit Guest*, distributed in the cars, each newspaper was permitted to circulate a fac simile edition in which its style, feature departments and make-up were made known to thousands of citizens without the paper going to the expense of distributing sample copies. In addition to this, during "Ride the Trolley Week," as recorded elsewhere in the JOURNAL, cars were placed at the disposal of the newspapers in order that they might feature contests of interest to the community.

Small reason, then, that such reciprocal action, backed as it was by the company's record of service to Pittsburgh, should have won such unqualified support from the press. In other words, the Pittsburgh Railways had something to say that was of civic value, and in attempting to put across the message it did not fail to consider that there were others who could derive benefit from its efforts. All of which leads the JOURNAL to make the query: "Is newspaper publicity so hard to secure after all?"

El Paso Peforming Creditable Merchandising Work

EVER since awakening to the realization that electric railways are in competition with private automobiles the efforts along merchandising lines have been in the process of development. Good work has been done in recent years, but naturally many mediocre efforts have also been made. However, all such efforts are moves in the right direction, and if hammered at long enough will result in ultimate good.

Occasionally efforts at merchandising are developed that are exceptional. The story of El Paso told in the JOURNAL of Jan. 22, 1927, is one of those accomplishments that indicate a flash of genius that is refreshing. Street car service that once stood in the background as "a basic necessity" is personalized by these efforts to a high degree. The stranger, for instance, arriving in El Paso for the first time immediately is informed that "this car takes you to your hotel." He does not have to look for inconspicuous signs or ask questions—the whole side of the car is used as a billboard to tell him the answer to the first question every stranger asks when he leaves his train.

Then for the home folks as well as the stranger the advertising cards have been re-created so that the reader is made to think of Heinz soup and street car service as somehow linked together. Not only Heinz is called to mind in a new connection, but the car service is forcibly advertised at the same time.

Such skillful linking together of disassociated ideas is a mark of cleverness that, taken alone, stamps the El Paso work as a real achievement in advancing the art of merchandising service.

The Intangible Factor in the Commercial Department

IN STRESSING the need for developing commercial sense in street railway operation, R. N. Graham in the JOURNAL for Jan. 15 contributed a vital thought to the industry. Mr. Graham, writing from the standpoint of a practical operating man, goes beyond the accepted practices of selling service to focus attention upon the business that may be derived as a result of impressions as intangible as they are vital. In so doing a goal had been set up to which the present railway practices are but quarter posts on the racetrack of business.

To illustrate: It is quite possible by means of a well-organized publicity campaign, a splendid roadbed, attractive cars and well-balanced schedules to have the town talking, so to speak. But these in reality never impress the public that the operating company has plumbed the sentiment of the community or that it is not trying to mend an old garment with new cloth. In other words, all of these modern phases of transportation may be present, yet selling service to the saturation point is impossible because no study has been made of individual or conglomerate phases. Here is where we find the intangible factor.

To determine what will appeal to the greatest number of citizens and what will create it by means of balancing all the factors that enter into railway management is clearly the function of a specialized department. Unquestionably such a department in a reasonable length of time will deduce the intangible factor that finally solves the equation of 100 per cent business.

There is nothing highbrow in considering this intangible factor. Hundreds of manufacturers and merchants have already appreciated its value. The electric railway industry is a manufacturer that so far has, like other manufacturers in the old days, relied upon the product to sell itself, particularly as the product was a necessity. That day is past. With the advent of the automobile, the necessity for transportation became the necessity to sell transportation, hence inventive genius must be called upon to meet the situation. Now the industry is called upon to fight an ever-increasing tide of private transportation, the cost of which seems to be no deterrent. To win back this lost business is a task for specialists, who besides possessing technical knowledge should have vision, taste and that rare gift the ability to judge human nature.

To bring about this desired result has been the prime reason for establishing commercial departments in the various industries. As far as the commercial department in the street railway industry is concerned, it will be considered efficient and to have reached the goal set by Mr. Graham when it can get the average citizen to say he prefers to ride on a street car but cannot give the reasons for such preference.

Some Things Detroit Is Thinking About

IMPORTANT as were the questions raised by one of the Detroit aldermen calculated to fix the relative earning power of railway and bus lines of the Detroit municipal railway, they are as nothing compared with some of the other transit issues that have raised their heads in that city. As indicated in the ELECTRIC RAILWAY JOURNAL for Jan. 22, the Mayor thinks that the burden is unbearable to which the city committed itself under the terms of the contract by which it agreed to take over the lines of the Detroit United Railway. He may or may not be right, but the fact that the question has been raised just at this time is causing no little concern, particularly as it would appear that a fare increase is necessary unless the contract is modified.

In all the bickering at Detroit, just what is one to believe when certified accountants of national reputation and the system's own auditors present reports that are about $1,000,000 apart? That is quite a discrepancy, so much so that another audit has been suggested. It may seem queer to men accustomed to dealing with facts and figures that two reports covering the same period on the same property could differ so widely. Those who pretend to know say that the explanation is to be found in the accounts for "depreciation charges." It is explained that the system's own accountant has failed to charge off $1,096,000 for depreciation. This is a sum, so city officials say, a private company would charge off. A sum similar in amount is applied by the city to the purchase of the lines from the private company. In this connection the ELECTRIC RAILWAY JOURNAL finds itself largely in agreement with the Detroit *Free Press* on some of the conclusions drawn by that paper from events at Detroit, notably the expressed sentiment that the conflicting audits raise the question whether, if the Detroit municipal railway continues to travel the financial road it has been going, the city of Detroit will have any property of real value to show for its money and pains when it gets through paying the Detroit United Railway for the property it forced that concern to sell and has also met other cost obligations.

Apparently the effort at Detroit is to maintain the *status quo*. In this respect it has been charged that for the past eighteen months the physical property of the system has been allowed to deteriorate, presumably in order to make a fictitious showing of earnings. This statement will probably be resented, but the feeling is difficult to overcome that politics is seeping in at Detroit, ever so gradually, perhaps, but seeping nevertheless. It was inevitable, and the present city administration need not be too resentful of criticism to this effect.

Criticism, merely as such, defeats its own ends. Capable operators still remain with the Detroit municipal railway, but the conclusion is inescapable that it can hardly be expected they will be able to keep the property up to its former level of efficiency unless the degree of initiative in their moves is permitted to be enjoyed that existed at the inception of the municipalization of the system. It might have been possible for the city to assume a rocking-chair attitude of repose under a proper grant to a private company, but it certainly cannot do so under municipal ownership. All of which goes to prove that a municipal railway is subject to all the hazards that attach to private operation and a few—a very important few—that seldom, if ever, cause concern to the private utility handled with any degree of perspicacity. Certainly recent events at Detroit do not appear to be reassuring.

London Woman's Sudden Wealth Shows Community Value of Transportation Service

SINCE the opening of the London Underground Railway extension to Edgware a land boom has spread over that entire district. Values began to increase even before construction work commenced, and with the completion of every new half mile of track they grew by leaps and bounds. Fifteen years ago a woman had come to Edgware with the idea of spending the rest of her life in the seclusion of the country and had purchased a house on five acres of ground for $25,000. When the Underground began to look for a site for its terminal, the engineers decided that the logical spot for it was exactly opposite the center of this woman's property. One morning a real estate agent called on her and offered her $150,000 for her land. This she accepted without further ado, and the five acres now constitutes the finest business site in Edgware. Many stores have been erected where formerly there were only open fields and the section adjacent to the terminal has become an active center for local merchants.

Thus another striking illustration is afforded of the well-known fact that land is valuable only to the extent to which it is accessible. All other factors remaining the same, the coming of electric railway transportation increased the value of this property to six times what it was before. After all, there seems to be some good in the railway, despite the horrible pictures of their wickedness which the demagogues love to paint.

Grand Rapids Makes Its Report

ELSEWHERE in this issue is abstracted the annual report of the Grand Rapids Railway, whose achievements have occupied many columns of space in the JOURNAL during the past two years. In fact, some have wondered why all this attention was being paid to Grand Rapids; why this comparatively small property in a Michigan city of some 150,000 population was the cause of so much discussion in the industry.

Part of the answer is given in the annual report mentioned. The proof of the pudding is in the eating, and the final test of a railway management is its balance sheet. In the Grand Rapids report there are some mighty significant things. They are not spectacular, but they are significant, nevertheless. They do not indicate that the railway property there has suddenly become a gold mine to its owners. But the results accomplished by the serious attempt which was made on this property to see what could be done toward making a community proud of its railway seem to indicate not only that the policy adopted was sound, but that it was good business as well.

During the period from July 1, 1926, after the new cars were put in service on three lines in the city, to Nov. 30, 1926, passenger revenue on these lines increased 2.51 per cent over the corresponding period of the previous year. During the same months revenue on the remainder of the system not equipped with the new cars fell off 0.99 per cent. In weighing these figures it must be borne in mind that business conditions in the city were practically constant during the year and that the period of comparison is during the summer and early fall months when railway revenues suffer most from the use of private automobiles. Here in a city of 150,000 population is a different story on passenger revenue from that told in most cities of this size throughout the country. It must also be remembered that there are only 27 of these new rail coaches, as they are called, out of a total of approximately 100 cars operated in the city.

On the cost side of the ledger a similarly convincing story is told. Through general operating economies effected on the property during the year operating expenses were $8,465 lower during the first five months of 1926 than for the corresponding period of 1925. But after the new cars were obtained the decrease for the remaining seven months of the year in comparison with the corresponding period of 1925 was $45,170.

To measure the value of the good will created for the railway by the favorable effect of its new equipment is obviously impossible. But when the Mayor of the city is led to say in the public press that the city has such cause to be proud of its railway as to be well justified in subsidizing its operation, if that ever becomes necessary, and when a state senator from the Grand Rapids district openly advocates a change in the city charter so that the railway may be relieved from street paving, some measure of the value of the public good will being created may be obtained.

Grand Rapids has made its first annual report since its practical application of modern business psychology to railway management, and that report almost speaks for itself. It should prove of more than passing interest to railway managers in many medium-sized cities that have so far failed to find an answer for a constantly drooping curve of passenger earnings.

A Bevy of Chorus Beauties from the "Yours Truly" Company That Assisted in the Publicity Campaign of "Ride the Trolley Week"

Making Pittsburgh Trolley-Conscious

Host of Ingenious Publicity Stunts, Indorsement of Newspapers and Official Approval by Mayor of Pittsburgh Marked the Introduction of "Ride the Trolley Week"

"A WEEK for this and a week for that" has become of such recognized value to American advertising practice that the Pittsburgh Railways recently determined to employ this high-powered method in selling transportation to citizens of the Iron City.

Once the period of Jan. 10 to Jan. 16, inclusive, had been fixed as the "Ride the Trolley Week" the commercial department, under the direction of W. H. Boyce, commercial manager, began to lay out a comprehensive program that would make Greater Pittsburgh trolley-conscious.

MAYOR KLINE GIVES OFFICIAL SANCTION

Official recognition from the municipality was thought to be the first step, and this was accomplished when Mayor Charles H. Kline issued a proclamation on Jan. 3 urging all loyal Pittsburghers to support in every way the effort of the railway company to render more efficient public service. Mayor Kline recommended that citizens avail themselves of this service, stressing the common interest now existing between the city and the railway company because of the recent traction agreement. Enlarged fac similes of this proclamation—perhaps the first of its kind—were displayed on all bulletin boards in the carhouses and shops; also in all offices of the company and in those of affiliated gas and electric interests.

About 1,500 paper burgees which carried pink letters on a black background, were hung from the span-wire intersections at important streets and were used as decorations in stores and offices. This publicity was put up some time in advance of the opening day and was followed on Jan. 5 by about 1,500 paper pennants bearing the slogan of the week which was printed in white on blue and red backgrounds. Through the courtesy of Barron G. Collier, Inc., front dasher space, usually sold for mercantile and outside advertising, was placed at the disposal of the company. This dasher placard bore the slogan "Ride the Trolley Week—Jan. 10-16," and was printed in yellow letters on black background. Inside the cars there were posters illustrating a two-car train being boarded by eager patrons; each poster carried the invitation "Join the Big Parade—Ride the Trolley Week."

Another feature of the campaign was the use of 9x22-in. placards or snipes, each carrying a different message or slogan. Some of these printed eye-attracters were:

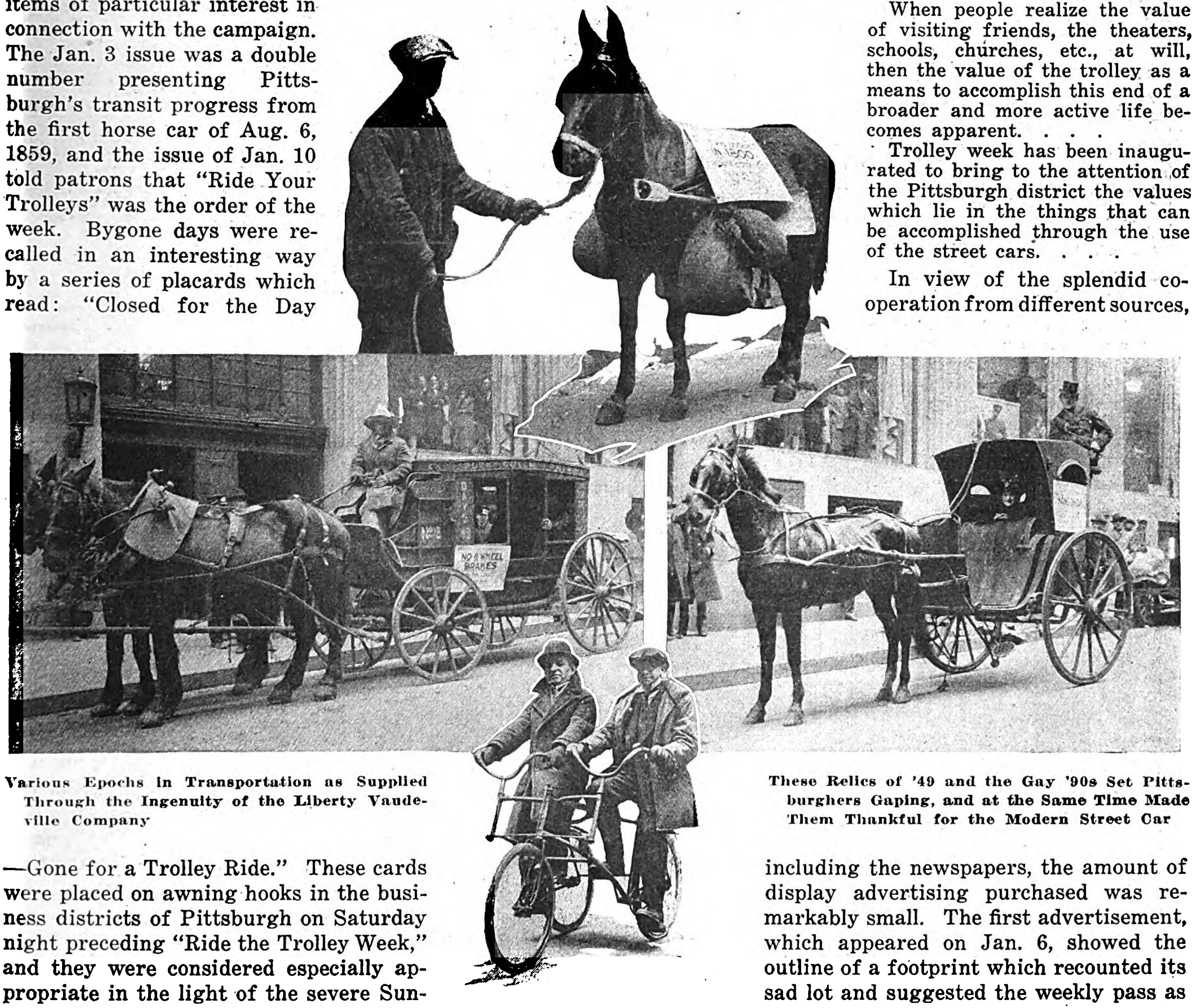
Flapper Flo Says:
"We go to the movies oftener when sweetie has a pass."
(A reciprocal boost for the films)

Your January
Weekly Pass Coupons
Are Good Toward the Purchase
Of a Telechron Electric Clock.
Gas and Electric Shops
(A reciprocal boost for the gas-electric companies)

To Noah, said a latecomer,
"Let's go, step on the gas."
"Keep off this ark," said Noah,
"You have no weekly pass."

Tired? Nervous?
Go Home by
Trolley Tonight

Where is my wandering boy tonight?
He's gone to see some lass;
Never fear, mother dear,
He's got a weekly pass.
The Board of Directors
Has Just Declared the Regular
Unlimited-Ride Dividend on
The Weekly Pass.



Various Epochs in Transportation as Supplied Through the Ingenuity of the Liberty Vaudeville Company

These Relics of '49 and the Gay '90s Set Pittsburghers Gaping, and at the Same Time Made Them Thankful for the Modern Street Car

In addition to these special side-window signs, *Transit Guest*, the house organ of the company, carried items of particular interest in connection with the campaign. The Jan. 3 issue was a double number presenting Pittsburgh's transit progress from the first horse car of Aug. 6, 1859, and the issue of Jan. 10 told patrons that "Ride Your Trolleys" was the order of the week. Bygone days were recalled in an interesting way by a series of placards which read: "Closed for the Day—Gone for a Trolley Ride." These cards were placed on awning hooks in the business districts of Pittsburgh on Saturday night preceding "Ride the Trolley Week," and they were considered especially appropriate in the light of the severe Sunday closing laws which are common throughout the state of Pennsylvania.

The associated Equitable Gas & Duquesne Light companies not only displayed this placard and others in their stores and offices, but also followed the Pittsburgh Railways' example of using the service vehicles for the display of linen banners. In their public salesrooms, the "Gas & Electric Shops," they also featured placards which read:

> Ride the Trolley Week
> Buy your weekly pass Jan. 7-8-9 and secure a free coupon to apply on the purchase of an electric clock.

This was in accordance with the practice begun in June, 1926, of giving appliance discount coupons to those who buy weekly passes in advance. Under the plan, a different article is featured each month with possible discounts of $2 and $2.50 according to the pass weeks of the month, and the holder of the coupon issued during a given month has three months in which to take advantage of reductions.

MERCHANTS CO-OPERATE

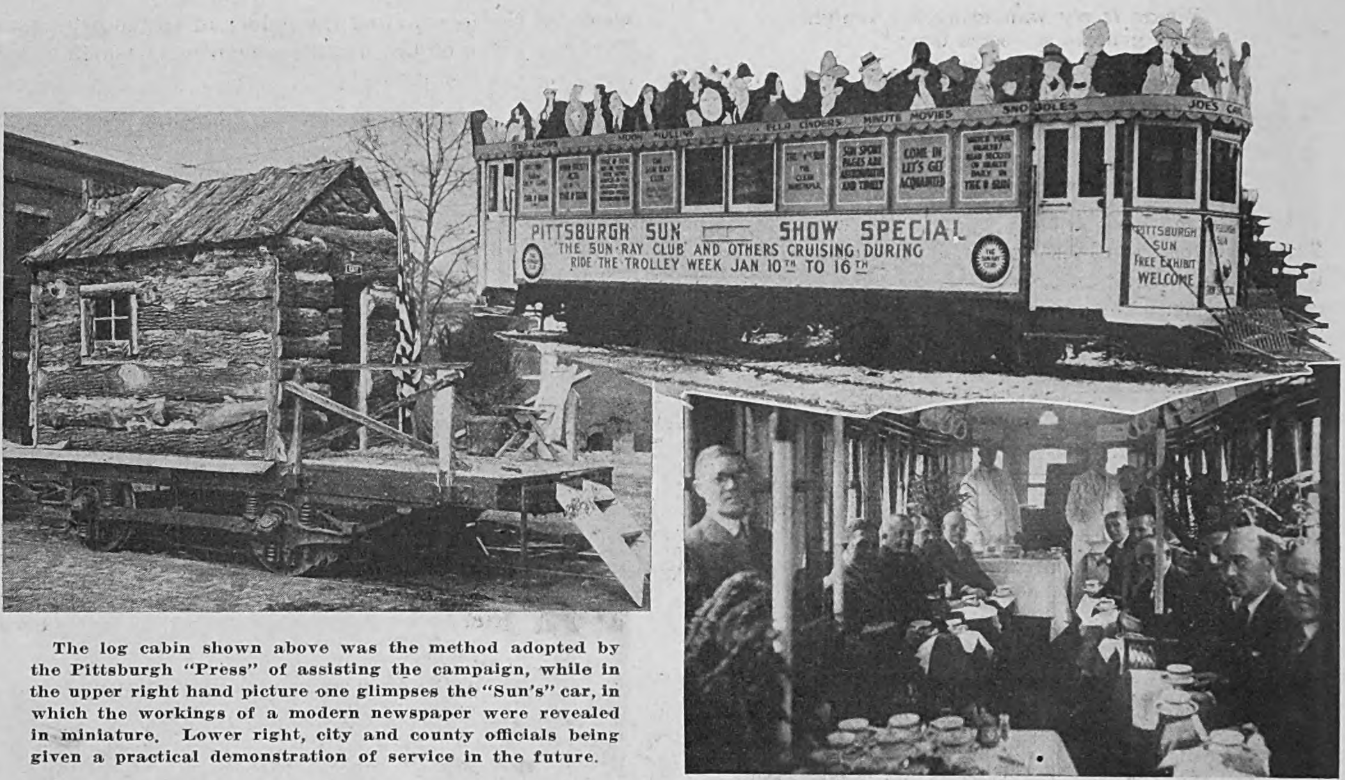
Through the courtesy of the Merchants' Association, 100,000 stuffers or circulars were printed to be placed in packages sent out by the big stores. The text of the message contained paragraphs of this nature:

> When people realize the value of visiting friends, the theaters, schools, churches, etc., at will, then the value of the trolley as a means to accomplish this end of a broader and more active life becomes apparent. . . .
>
> Trolley week has been inaugurated to bring to the attention of the Pittsburgh district the values which lie in the things that can be accomplished through the use of the street cars. . . .

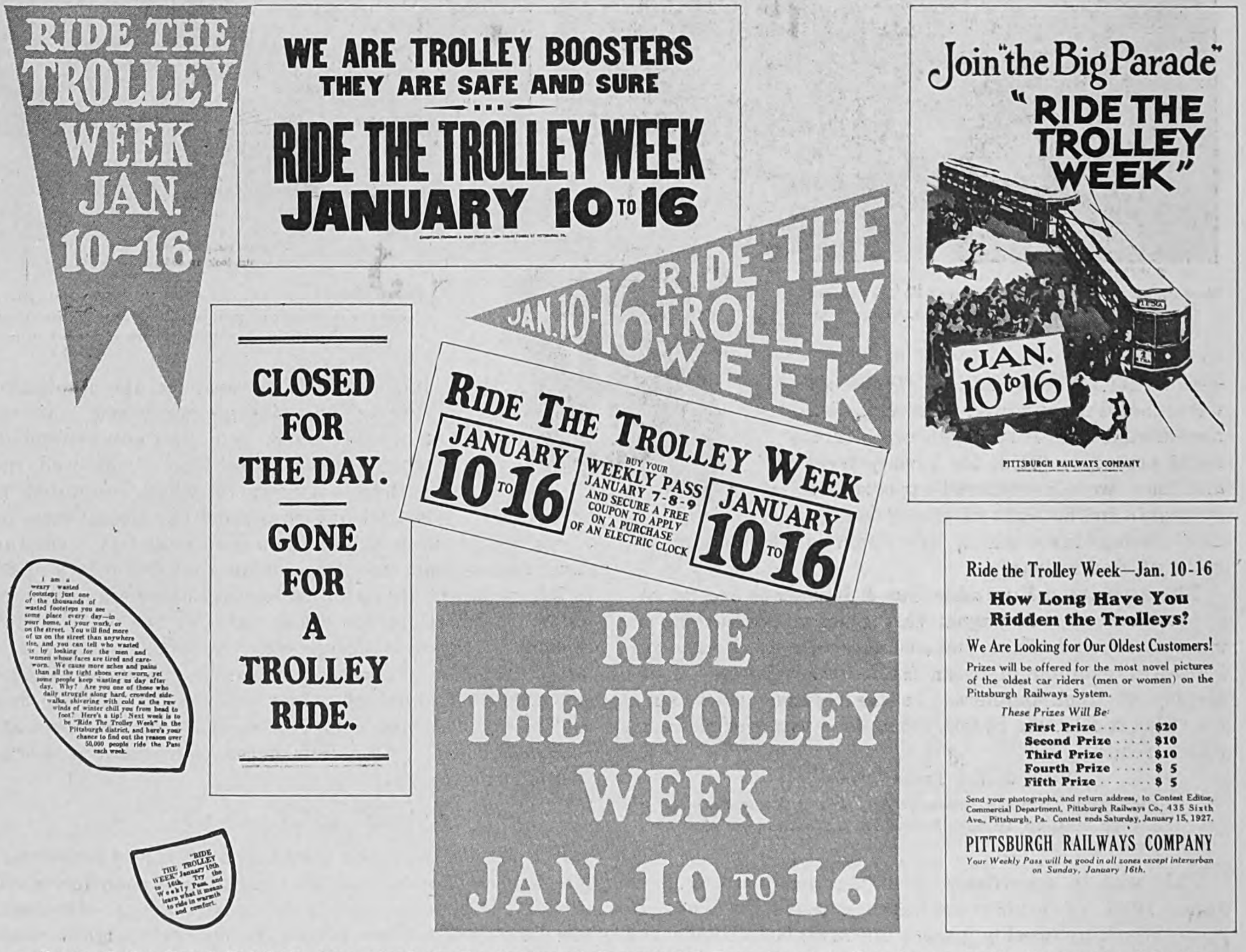
In view of the splendid co-operation from different sources, including the newspapers, the amount of display advertising purchased was remarkably small. The first advertisement, which appeared on Jan. 6, showed the outline of a footprint which recounted its sad lot and suggested the weekly pass as a way of avoiding aches, pains and cold feet. On the same day announcement was made that five prizes of $5 to $20 would be given to the oldest customers who submitted the most interesting pictures of "ye olden tyme" in transportation. Among other advertisements was a letter from Dr. Thomas S. Baker, president Carnegie Institute of Technology, which expressed the belief that the weekly pass had helped to increase night school attendance from 1,000 pupils three years ago to nearly 3,500 at the present time.

PRESS AIDS CAMPAIGN

In line with the spirit shown by the entire community, the *Gazette-Times* and the *Chronicle-Telegraph* gave splendid support to the campaign by direct editorials. The *Gazette-Times* expressed the opinion that the week would be a good time to see whether prejudice against the service of other days was justified now. On the


PITTSBURGH SUN SHOW SPECIAL
THE SUN-RAY CLUB AND OTHERS CRUISING DURING
RIDE THE TROLLEY WEEK JAN 10TH TO 16TH
COME IN LET'S GET ACQUAINTED
PITTSBURGH SUN FREE EXHIBIT WELCOME

The log cabin shown above was the method adopted by the Pittsburgh "Press" of assisting the campaign, while in the upper right hand picture one glimpses the "Sun's" car, in which the workings of a modern newspaper were revealed in miniature. Lower right, city and county officials being given a practical demonstration of service in the future.



RIDE THE TROLLEY WEEK JAN. 10–16

WE ARE TROLLEY BOOSTERS
THEY ARE SAFE AND SURE
RIDE THE TROLLEY WEEK
JANUARY 10 TO 16

JAN. 10-16 RIDE-THE TROLLEY WEEK

Join "the Big Parade"
"RIDE THE TROLLEY WEEK"
JAN. 10 to 16
PITTSBURGH RAILWAYS COMPANY

CLOSED FOR THE DAY.
GONE FOR A TROLLEY RIDE.

RIDE THE TROLLEY WEEK
JANUARY 10 TO 16
BUY YOUR WEEKLY PASS JANUARY 7-8-9 AND SECURE A FREE COUPON TO APPLY ON A PURCHASE OF AN ELECTRIC CLOCK
JANUARY 10 TO 16

I am a weary wasted footstep; just one of the thousands of wasted footsteps you see some place every day—in your home, at your work, or on the street. You will find more of us on the street than anywhere else, and you can tell who wasted us by looking for the men and women whose faces are tired and care-worn. We cause more aches and pains than all the tight shoes ever worn, yet some people keep wasting us day after day. Why? Are you one of those who daily struggle along hard, crowded sidewalks, shivering with cold as the raw winds of winter chill you from head to foot? Here's a tip! Next week is to be "Ride The Trolley Week" in the Pittsburgh district, and here's your chance to find out the reason over 50,000 people ride the Pass each week.

"RIDE THE TROLLEY WEEK" January 10th to 16th. Try the Weekly Pass and learn what it means to ride in warmth and comfort.

RIDE THE TROLLEY WEEK JAN. 10 TO 16

Ride the Trolley Week—Jan. 10-16

How Long Have You Ridden the Trolleys?

We Are Looking for Our Oldest Customers!

Prizes will be offered for the most novel pictures of the oldest car riders (men or women) on the Pittsburgh Railways System.

These Prizes Will Be:

First Prize	**$20**
Second Prize	**$10**
Third Prize	**$10**
Fourth Prize	**$ 5**
Fifth Prize	**$ 5**

Send your photographs, and return address, to Contest Editor, Commercial Department, Pittsburgh Railways Co., 435 Sixth Ave., Pittsburgh, Pa. Contest ends Saturday, January 15, 1927.

PITTSBURGH RAILWAYS COMPANY

Your Weekly Pass will be good in all zones except interurban on Sunday, January 16th.

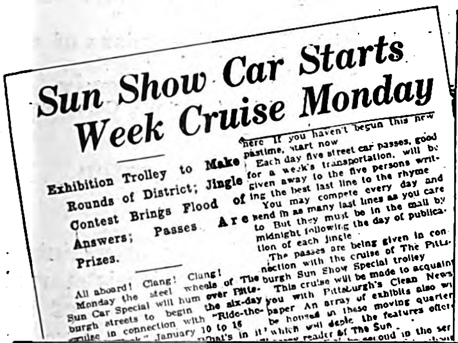
Some of the Novel Publicity Copy Used by the Railways' Commercial Department to Put Across "Ride the Trolley Week"

other hand, the *Chronicle-Telegraph* pointed out that improvement in equipment had been backed by lower fares through more transfers and both weekly and one-day passes.

Additional publicity was secured through the courtesy of the Kaufmann & Baer department store, operators of station WCAE. Service of the station was placed at the disposal of Thomas Fitzgerald, vice-president of the Pittsburgh Railways, who addressed the radio public on Thursday night, Jan. 6. Mr. Fitzgerald first discussed the amicable situation now existing in the city with respect to the transit problem, and then proceeded to these interesting comparisons between 1923 (Pittsburgh's biggest revenue year) and 1926:

1. Fare reduced from 6¾ cents gross to less than 5½ cents gross per ride.
2. Service increased by 1,700,000 car-miles.
3. Usefulness increased by 60,000,000 to 70,000,000 car rides.
4. One hundred miles of track completely rebuilt.
5. Nine new administration buildings erected for the transportation department.
6. Gross earnings $880,000 less.

Mr. Fitzgerald was followed by Frank R. Phillips, former general manager of the Pittsburgh Railways, and now vice-president of the Duquesne Light Company, and Fred R. Cogswell, director of traffic promotion.



Sun Show Car Starts Week Cruise Monday

Exhibition Trolley to Make Rounds of District; Jingle Contest Brings Flood of Answers; Passes Are Prizes.

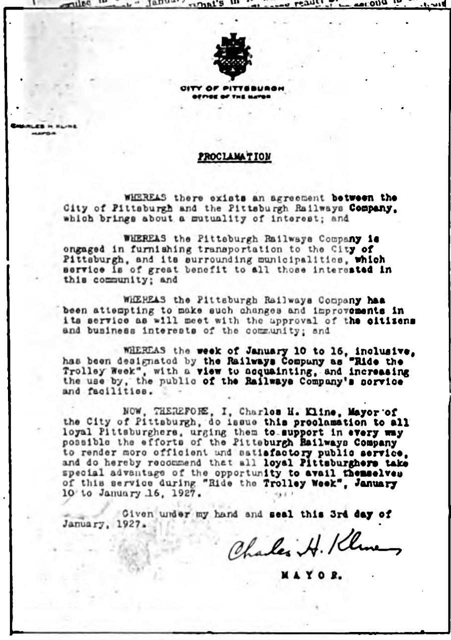
All aboard! Clang! Clang! Monday the steel wheels of The Sun Car Special will hum over Pittsburgh streets to begin the six-day cruise in connection with "Ride-the-... January 10 to 16

here If you haven't begun this new pastime, start now

Each day five street car passes, good for a week's transportation, will be given away to the five persons writing the best last line to the rhyme

You may compete every day and send in as many last lines as you care to But they must be in the mail by midnight following the day of publication of each jingle

The passes are being given in connection with the cruise of The Pittsburgh Sun Show Special trolley This cruise will be made to acquaint you with Pittsburgh's Clean News-paper An array of exhibits also w... be housed in these moving quarter... which will depic the features offer... The Sun.



CITY OF PITTSBURGH
OFFICE OF THE MAYOR

CHARLES H. KLINE
MAYOR

PROCLAMATION

WHEREAS there exists an agreement between the City of Pittsburgh and the Pittsburgh Railways Company, which brings about a mutuality of interest; and

WHEREAS the Pittsburgh Railways Company is engaged in furnishing transportation to the City of Pittsburgh, and its surrounding municipalities, which service is of great benefit to all those interested in this community; and

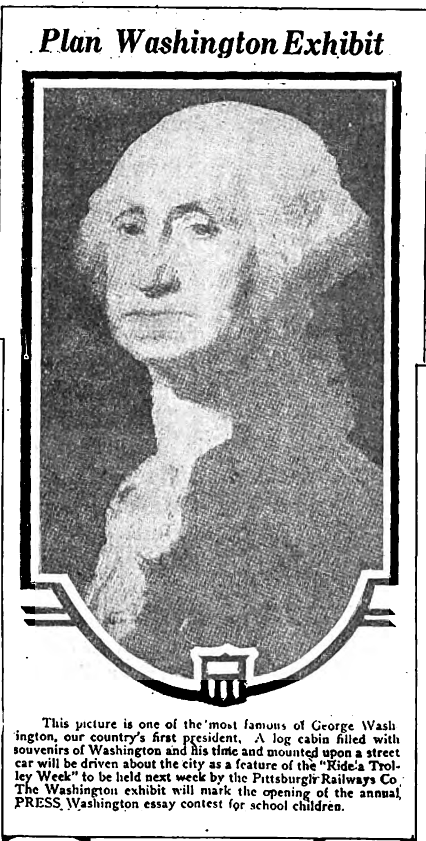
WHEREAS the Pittsburgh Railways Company has been attempting to make such changes and improvements in its service as will meet with the approval of the citizens and business interests of the community; and

WHEREAS the week of January 10 to 16, inclusive, has been designated by the Railways Company as "Ride the Trolley Week", with a view to acquainting, and increasing the use by, the public of the Railways Company's service and facilities.

NOW, THEREFORE, I, Charles H. Kline, Mayor of the City of Pittsburgh, do issue this proclamation to all loyal Pittsburghers, urging them to support in every way possible the efforts of the Pittsburgh Railways Company to render more efficient and satisfactory public service, and do hereby recommend that all loyal Pittsburghers take special advantage of the opportunity to avail themselves of this service during "Ride the Trolley Week", January 10 to January 16, 1927.

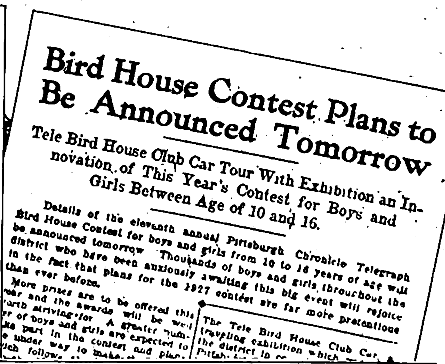
Given under my hand and seal this 3rd day of January, 1927.

Charles H. Kline
MAYOR.



Plan Washington Exhibit

This picture is one of the most famous of George Washington, our country's first president. A log cabin filled with souvenirs of Washington and his time and mounted upon a street car will be driven about the city as a feature of the "Ride a Trolley Week" to be held next week by the Pittsburgh Railways Co The Washington exhibit will mark the opening of the annual PRESS Washington essay contest for school children.



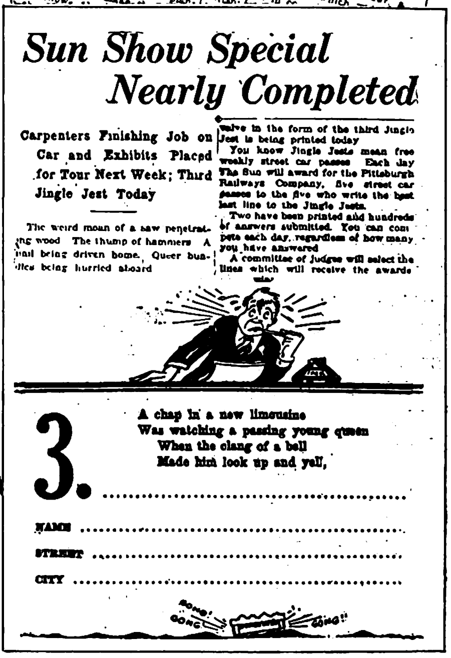
Bird House Contest Plans to Be Announced Tomorrow

Tele Bird House Club Car Tour With Exhibition an Innovation of This Year's Contest for Boys and Girls Between Age of 10 and 16.

Details of the eleventh annual Pittsburgh Chronicle Telegraph Bird House Contest for boys and girls from 10 to 16 years of age will be announced tomorrow Thousands of boys and girls throughout the district who have been anxiously awaiting this big event will rejoice in the fact that plans for the 1927 contest are far more pretentious than ever before.

More prizes are to be offered this ...ear and the awards will be well ...orth striving for A greater number of boys and girls are expected to ...ke part in the contest and plans ...e under way to make ...

The Tele Bird House Club Car traveling exhibition which ... the district in ...



Sun Show Special Nearly Completed

Carpenters Finishing Job on Car and Exhibits Placed for Tour Next Week; Third Jingle Jest Today

The weird moan of a saw penetrating wood The thump of hammers A nail being driven home. Queer bundles being hurried aboard

...valve in the form of the third Jingle Jest is being printed today

You know Jingle Jests mean free weekly street car passes Each day The Sun will award for the Pittsburgh Railways Company, five street car passes to the five who write the best last line to the Jingle Jests.

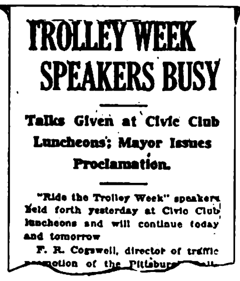
Two have been printed and hundreds of answers submitted. You can compete each day, regardless of how many you have answered

A committee of judges will select the lines which will receive the awards

3\.
A chap in a new limousine
Was watching a passing young queen
When the clang of a bell
Made him look up and yell,
....

NAME ....
STREET ....
CITY ....

Gong!
Gong!
Gong!



TROLLEY WEEK SPEAKERS BUSY

Talks Given at Civic Club Luncheons; Mayor Issues Proclamation.

"Ride the Trolley Week" speakers held forth yesterday at Civic Club luncheons and will continue today and tomorrow

F. R. Cogswell, director of traffic promotion of the Pittsburgh ...

Some of the Various Printed Appeals That Concentrated the Attention of Greater Pittsburgh Upon the Vital Question of "More and Better Trolley Rides"

Mayor Kline's Proclamation, Shown on the Left, Set in Motion "Ride the Trolley Week" and the Two-Column Appeals Revealed the Interest Shown by the Press

Several speakers assisted these gentlemen by making fifteen-minute addresses before different civic clubs during the week preceding the campaign, and to broaden the scope of the publicity 700 ministers were advised of the purpose of the drive with the respectful suggestion that a topical sermon might be deduced by comparing the transportation facilities in Biblical days with those available today. In addition hundreds of restaurants and theaters were asked to mention the campaign on their menus and programs, respectively. In the case of moving picture houses, many of them featured the "Ride the Trolley Week, Jan. 10 to 16, inclusive," slogan. They also flashed on the screen a yellow street car with the following legend:

> We have pledged ourselves to ride the street cars this week. So long—here comes the trolley now.

The theaters also were called on to supply further assistance in the person of vaudeville and musical comedy artists. Among these were Leon Errol, Ethel Bowen, and Gene Buck, producer of "Yours Truly." Miss Bowen, dressed as Sis Hopkins and traveling a-foot and a-car, attracted much attention with her antiquated satchel, which from time to time popped open to reveal the week's slogan. Leon Errol, famous for his comical falls, did ground and lofty tumbling from a trolley car, having as his motorman Gene Buck and as a background a group of chorus beauties. The Liberty Vaudeville Company, through which Miss Bowen was engaged, offered a clever variation of the evolution of travel by sending through the city a battered Frisco stagecoach, miner's pack mule, hansom cab and a two-passenger tricycle.

In spite of this, however, perhaps the outstanding features of the "Ride the Trolley Week" were the dressed up street cars. In this connection it is of interest to note that four of these cars advertised Greater Pittsburgh's leading schools. The cars were run in regular passenger service on the crosstown routes, to give the greatest publicity per mile run. They were in keen competition for public interest with those sponsored by the evening papers. The *Chronicle-Telegraph*, which has given prizes to boy builders of bird houses for the past ten years, ran a "Tele Club" car. The car, painted light yellow, contained live and stuffed birds in both cages and houses and was specially designed in connection with the paper's eleventh contest for trips to Washington. It was accompanied on its trips through the town by a lecturer, reporter and photographer.

The *Sun* car was painted lavender with the text matter done in purple and cartoons of *Sun* comics appeared around the top on the outside of the car. Inside was an exhibition showing how a newspaper receives news and how its various features are made up. As a means of reciprocity, the *Sun* featured a missing line limerick contest for which the Pittsburgh Railways was to give as prizes for the most amusing endings five weekly passes during six days. The *Sun* had expected from 200 to 300 jingles a day, but the average exceeded 1,000, which necessitated increase in the number of prizes.

A log cabin built on a flat car was the unique contribution of the *Press*. Inside was a collection of articles associated with George Washington, and an impersonator of the Father of His Country met the boys and girls to give them a button and register them for the 100-word prize essay contest which was sponsored by the paper. As an added feature, the *Press* announced that the Pittsburgh Railways had donated 30, and then increased it to 60, passes as a prize for the best letter on results from want ads.

Realizing that a campaign of this nature would not be productive of major results unless service was maintained at the highest efficiency, Mr. Cogswell, director of traffic promotion, made a careful survey of every situation where an increase in service appeared desirable to meet any likely contingencies. There were no special fare reductions offered in connection with the campaign, except that the weekly pass, usually confined to the area one fare each side from Pittsburgh center, was made good for all city car zones on Sunday, Jan. 16. This meant that the holder of a weekly pass would have the same Sunday privileges as are granted under the 40-cent-all-zone Sunday-holiday pass. This extension of the weekly pass privilege was tried for the first time on Sunday, Nov. 14, 1926. In this connection it is significant that during the campaign $58,937 was realized from the $1.50 weekly pass sale, which was an increase of $2,700 compared with the same week in 1926.

A number of President Robertson's staff members wrote letters to their personal friends. A good example of the replies follows:

> I do not know whether you are particularly interested or not, but we have been advocating in our office to our salesmen the use of the street cars rather than the automobile as an aid to efficiency. Some of our best salesmen have followed our advice and have tried out the suggestion with good results.
>
> They have found that where heretofore they have used automobiles daily, and therefore habitually, by using the street cars four days out of a week they have increased their efficiency and considerably reduced the wear and tear on their nervous system, to say nothing of the decrease in their personal overhead.
>
> I am starting this year with a discussion of efficiency methods, and I am going to bring out the value of the use of the weekly pass, not only from an economic point of view but as a time saver. I shall advocate cutting out the personal automobile entirely for business purposes, and the use of the street car where they can, and the taxi where the street car will not suit.
>
> I thought you might be interested in these plans of one of the most efficient sales organizations in the country.
>
> LEE D. HEMINGWAY,
> General Agent Connecticut Mutual Life Insurance Company.

Left Rule of Road on Rochester Rapid Transit Line

A DEPARTURE in railway methods will be introduced in Rochester, N. Y., when service is started on Rochester's rapid transit railway in the bed of the abandoned Erie Canal. Instead of operating cars on the right hand track in the direction of travel, it is planned to use the left track.

This radical change from right to left hand service is due to the installation of island platforms at the fourteen stations within the city limits, it was explained. These platforms are built between the eastbound and westbound tracks. Access to the midway platform is provided by stairways from the street level.

In order to relieve the operating company of the cost of rebuilding its equipment to meet the American or right hand travel system, the city engineers in charge of the railways decided on use of the English or left hand system. Otherwise passengers entering the subway would have no way of boarding or leaving the cars by way of the island platforms, which have no connection with the sides of the railway.

It is expected that the road will be in operation in the spring, although a movement was on foot among business men to force the opening of the line last fall. No definite plan of operation nor decision as to who shall operate the city-built railway has yet been evolved. This matter is up to a citizens' committee appointed by the late Mayor Van Zandt and headed by John P. Morse.

All the city stations are complete. Besides caring for interurban traffic, thus relieving street congestion, the new line, which bisects the city, was built for use by local steam railroads to provide better switching facilities for industries of the city.

Traffic Control Surveys to Be Made in 250 Cities

PLANS for the work of the committee of the American Engineering Council which is to co-operate with the National Conference on Street and Highway Safety were outlined at the annual meeting of the council, held in Washington, D. C., early in the present month. It will include a survey of the methods for traffic control in about 250 cities which have populations of more than 50,000, together with a few smaller sample cities to be picked out geographically. Engineers living in these cities will be expected to co-operate by collecting the necessary field data. The committee of the Engineering Council is headed by W. B. Powell.

Taxing the Utility

Taxing Systems Are Reviewed, with Particular Reference to New York State—The Gross-Net Principle Is Believed Fundamentally Sound and Should Be the Only Tax the Utility Should Pay

By Edwin R. A. Seligman
Professor of Economics Columbia University, New York, N. Y.

Editor's Note—Prof. Edwin R. A. Seligman of Columbia University, nationally known economist and tax authority, delivered an address before the regular and advisory members of the committee on taxation of the American Electric Railway Association at the meeting of that committee in New York held on Dec. 10, 1926. This meeting was briefly reported in the Journal for Dec. 18. The address by Prof. Seligman was given extemporaneously and the stenographic notes have been edited by the author.

The address was a part of the committee's study of utility taxation. It was considered of such interest that it has been abstracted in this article.

NATURALLY the methods of imposing taxes are of vital interest to you as well as to the public. Quite naturally and justifiably you look at it from the point of view of your own interests and the conservation of your own properties. On the other hand, many of you have also learned to regard it from the additional point of view of the larger economic problems involved; that is, from the point of view of social policy and general economic welfare. For the most forward-looking men among you, like the big men in every business, realize that in the long run you cannot prosper unless the community prospers and that this interdependence—this dependence of business profits upon general welfare—is inevitable.

This is the point of view from which I shall endeavor to approach the subject. I am not unmindful of the problem of earnings and profits. After all, each of us takes up his particular vocation from the point of view of making a living or earning an income, but if he is wise he also adds to it the point of view of the equities involved. Thus I want to show, if I am able to, that there is a correlation between your own welfare and that of the public.

Leading up to that, let me say a word first as to the genesis of the problem. Although it is an old story to all of you, let me recall to your minds how it has come to be a problem with us. It is a curious fact that it is not such an extensive problem anywhere else in the world, not in England, not in France. The reason why it is a problem here is because our existing tax system is a survival of an earlier system which was indeed well suited to the more undeveloped and primitive conditions of a colonial or undeveloped economic community, whereas in all the other countries of the world when the street railways or the various public utilities came into existence the economic conditions had already changed materially.

With us, as you know, the system in the eighteenth and the nineteenth centuries was that of the general property tax, a system which had existed all over Europe in the Middle Ages, but which had been outgrown in each of the European countries long before the nineteenth century. As the general property tax responded to the instinctive feelings of justice on the part of the American taxpayer at that time, what was more natural than that when the first few corporations began toward the end of the eighteenth century, and then gradually increased during the first quarter of the nineteenth century, such as toll roads, canals and banking corporations, the community should endeavor to fit this new phenomenon into the existing situation. The fact was that every man was taxed or supposed to be taxed upon his entire property, real and personal. Unfortunately this did not work well from the very beginning, for the obvious reason that a corporation is not an individual. It is a fictitious person, but not an individual.

So far as the real estate owned by this fictitious person was concerned, there was not much difference viewed as a tax problem from the situation presented in taxing an individual. The difficulty arose when it came to the personal property, because as over against the personal property owned by individuals, consisting mainly of tangible goods—the pots and the pans of the housewife and the stock in trade of the merchant—the corporations had something else. As time went on and as corporate securities—first the stocks and much later on the bonds—developed, it was found that there were certain incorporeal rights attaching to a corporation, rights which nevertheless formed a part of their property, which could be bought and sold and which had a value. Therefore, to make a long story short, the problem that arose with us was this: What is the franchise, this peculiar thing, this liberty or privilege conferred upon artificial persons by government? How are you going to define it? How are you going to measure it? How is it to be valued and taxed?

TAXATION IN ENGLAND ON A DIFFERENT BASIS

Now this problem never arose anywhere else in the world. Why not? Because by the time corporations developed in England (let us confine ourselves to the England with which you are more familiar) the system of taxation there had become an entirely different one. As you know, there are two methods of measuring wealth, the basis of taxation. One is to figure it in terms of possession of property. But another method, and from the economic point of view the more fundamental, is that of utilizing the returns which when capitalized go to make up the property.

Our problem, moreover, was becoming increasingly difficult because the property which we had to measure and to evaluate in order to fit it into our system of taxation was becoming ever more elusive. It was intangible, and it was intangible not alone in the sense of corporate securities but it was intangible in the sense of this incorporeal privilege. After efforts more or less unavailing, however, all through the first half of the last century and down to 1875, it became increasingly difficult to tax the corporations with any semblance of equality either as among themselves or with reference to other property. Even real estate formed no exception, because in the case of the land which formed the right-of-way of the steam railroads, one stretch was valued like cow pasture and another was assessed at immense sums. The disparity was absurd because of the different criteria applied.

IN 1880 CAME THE FRANCHISE TAX

Thus it came about that in 1880 the state of New York, following the lead of Pennsylvania, which was then in the van, and despairing of reaching corporations in general for state purposes by a tax on the tangible property, introduced the tax which in the next year became known as a franchise tax. This franchise tax was, and still is, imposed upon the capital stock, although the rates vary somewhat according to the returns on that capital stock.

All sorts of difficulties soon disclosed themselves. As tax rates became high they became unequal. As a natural consequence every corporation, as every individual would have done under similar circumstances, tried to rid itself of the burden. So far as individuals are concerned, you remember that our general property tax long ago became grossly unequal. At present in this state the personal property tax, by law on intangibles and in practice on tangibles, has disappeared for state purposes and largely for local purposes.

Then a clamor arose against the public utility corporations. It was about in the '70s that the Granger movement in the West was directed against the railways. Subsequently, owing to many reasons which I need not mention here, the general feeling of suspicion of large aggregations of capital became more pronounced. Finally something had to be done about taxing the transportation companies, not only steam but now also the street railways as well as the others.

THEN THE UTILITY BECAME PUBLIC

We began to call them public utilities or businesses related to the public interest. They were now conceived by the community as standing in a class by themselves and as not susceptible to that condition of private ownership which is common in ordinary industry.

By the time the tax laws of the '90s were passed, affecting the electric railway industry, the situation had changed a little. There was an uneasy feeling on the part of the general public that there was something wrong with the American method of measuring wealth. So many inequities were involved that it often resulted in the tax being based on the private arrangement with the local assessor rather than the personal property. However, the business man now began to measure his prosperity, not in terms of capital or stock or business inventory, but in terms of profits. His prosperity depended on what he made. Here might be two business men, each having the same amount of stock, the one with a turnover ten times as great as the other, with a consequent greater degree of prosperity.

EARNINGS CONSIDERED AS A MEASURE OF WEALTH

Thus you see that the idea of earnings rather than of property began to come to the front. At first it was very crude. When the state began to apply it to corporations, it said: "Let us tax them upon their gross earnings." It is obvious why they did that. In the first place, that is about the only kind of earnings they could tax, because when they tried to get the net earnings there was no way of ascertaining them. Even among the railways there were no good methods of accounting. Every railway kept its accounts in its own way and according to no governing standard.

Thus under the conditions of that day the gross earnings tax was the only one which was practical. Here again, as time went on and as more refined methods of measurement became customary, it was realized that the gross earnings tax was a very primitive system. It was like the Biblical system applied to land—the tithe, the 10 per cent of the gross, which we still find in primitive communities in the world today, such as China.

The reason why gross earnings no longer responded to a sense of equity among the corporations themselves was that it drew no adequate distinction between the prosperous and the unprosperous companies and that it made no allowance for necessary expenses. As conditions became more complex the inequalities were intensified. Naturally, therefore, there began to arise more and more discontent. A slight attempt to meet the situation was made by the law of 1896, as a result of which the tax, although still on gross earnings, was supplemented in a minor degree by a reference to dividends.

THE SPECIAL FRANCHISE TAX APPEARED IN 1900

In New York, and in contrast to many other states, we are not allowed to deduct our debts from our real estate. In most states, if you have a farm worth $10,000 and borrow on it $5,000, you can deduct the $5,000 which you owe, but not so in New York. On the other hand, if you have debts you are allowed in the state of New York to deduct them from your personal property, a condition contrary to that which exists in most states.

In the case of one of the large railways the company found that it had been heavily burdened by unreasonable assessments on its personal property by the local assessors. Accordingly it tried to reduce the burden and devised an ingenious method by which the capital stock was reduced and replaced by a large issue of bonds. Then, of course, under the law a bonded indebtedness was deductible from the personal property, tangible as well as intangible. By issuing this great amount of bonds, the company was thus able to make its personal property a minus quantity. Moreover, it owned but little real estate, because it used the public streets, which were not liable to taxation. As a result the local tax was virtually eliminated.

Something had to be done. The company paid no taxes at all or very little taxes. In order to silence the public clamor which ensued, an ingenious senator suggested a new plan—to replace the whole existing system of taxing railways by something new. The privilege to use the streets which the state confers was called a franchise—not a general franchise, because that is the franchise to be a corporation, but a special franchise. Moreover, it was declared to be real estate, so that all the mortgage bonds would not be deductible from the assessed value.

It was about that situation that Governor Theodore Roosevelt asked me to consult with him in 1899. I told him at the time that while it was a most ingenious method and while it would surely accomplish its object, that of bringing the railways to terms, I foresaw not a little of future difficulty. I had already by that time come to the definite conviction that our method of attempting to assess wealth in terms of property was erroneous and that this new attempt would simply add another difficulty to the problem. But the political powers had determined to make capital of this situation, and, therefore, the advisers of the Governor tried to make it as good a tax, or as little bad a tax, as we could. Thus we came to have the special franchise tax.

THE TAX COMMISSION DETERMINED THE FRANCHISE VALUE

From this point on, the railways especially, and many other public utilities, began to have their worries. Why? Because the value of the franchise was relegated to the State Tax Commission and nothing was said in the law as to how it should proceed to value the franchise. Those of you who are acquainted with the situation in other states know that there are about as many different ways of valuing a franchise as there are human beings who do the valuing. Of recent years our commissions and officials have become very cautious in telling us how they value the franchise. The caution is easily explicable because as soon as they tell us how they value the franchise, you can attack it in the courts and perhaps overturn the assessment. But if they say, "We consider this the proper valuation," you can't very well claim that there is anything illegal about it.

So that is the situation as we have it today. The situation is further complicated by another unfortunate fact. As the price of securing the local franchise most of the street railway companies made all sorts of arrangements with the local bodies about paving and whatnot. In those days, horse cars were used and the horses continually got the stone pavement out of shape. That was long before the advent of good roads, the appearance of the automobiles, and the passing of the horse car. What was at one time a matter of little consequence has now, as many of you know, become a very decided burden.

In the meantime, while this antiquated and primitive system of taxation still applies to you, the efforts which some of us had been putting forth for some time bore fruit. In the case of personal, individual taxation our system has been completely changed in New York State. That is to say, we no longer rely upon the general property tax for either state or local purposes. New York is about the only state in the country which has gone almost to the limit.

In the first place, the property tax, even for local purposes, has become to all intents and purposes a real property tax. Ninety-eight per cent of the property tax or the so-called direct tax is raised from real estate.

Moreover, for state revenues, while we still have the so-called direct tax, it plays a very small rôle as compared to earlier times. We get ten, twelve or fifteen millions a year out of our total revenues of $150,000,000 to $200,000,000 a year. It has been replaced, as you know, by the income tax, the personal income tax and the corporate business tax. The personal income tax yields us this year about $40,000,000 and the corporate business tax, also levied on net income, yields about $60,000,000—together about $100,000,000.

Unfortunately, the so-called public utilities had been left out. In the rest of the world no such distinction is drawn between public utilities and other corporations. This is partly because the early public utilities behaved themselves better there than they did with us, or were made to behave better by Gladstone and others at an early period, and partly because of the peculiar economic conditions in this country, whereby the public utilities were recognized as belonging in a class by themselves. Accordingly they were omitted in this general reform.

What you gentlemen now have to face is the question as to how you should be made to fit into this general change which has been applied to all the other interests, including even the banks. The banks were the very last of the corporations to come in. They were formerly in the same position in which you are, but they were finally induced to come in under the general income tax law.

In the attempt to solve this difficulty, we said: "The simplest thing, of course, would be to do as they do in England, France, Germany and Italy, namely, to apply the general rule of the income tax and make all the companies subject to a general corporate income tax."

There were, however, two reasons which prevented us from accepting that simple solution. The one was that the problem of local taxation is a very difficult one with us in this country. How are we to raise the funds for schools and for roads? In those days we didn't get so much help from the state and the federal governments as we do now.

If the public utilities were freed from the obligations to pay taxes on real estate, it would impose a burden upon the individual owners of the rest of the real estate. Inasmuch as a given amount of money has to be raised, if you eliminate a large proportion of the taxables, obviously it must be raised by the rest. Thus you see that if the local real estate tax were abolished the public utilities would be deemed a disadvantage rather than a blessing to the localities. The local taxpayer would feel that he would have to dig his hands into his pockets because of the freedom of the public utilities from the real estate tax. That was one thing with which we had to reckon. The other was that while income or net earnings, from the abstract point of view, is decidedly the better, it is not ideal.

INCOME TAX OF EVER-INCREASING IMPORTANCE

That is the reason that, whereas the Civil War was waged with practically no income tax at all, the recent great war has been financed almost entirely upon the proceeds of the income tax. The income tax is today the sheet anchor of our whole national finance. Although income has many advantages and although we are all tending away from our property tax to the income tax, there are certain disadvantages to this method as a criterion of tax-paying ability. There is, in fact, no absolutely ideal system of measuring capacity to pay.

One of the disadvantages is that in a lean year the income is materially reduced or might even change into a deficit, whereas from the point of view of the public, the government expenditures must go on, in good or in bad years. Of course in bad years we may have smaller expenditures, but still the expenditures will not decrease in correspondence with the bad times. Since therefore you have the expenditures, you have got to have some sort of revenue. If your tax system is based entirely on income, where are you going to be?

THE GROSS-NET TAX

The consequence was we devised what we call the gross-net system. That, in a nutshell, is a system which imposes a small tax upon a corporation according to its gross earnings so there will always be a revenue, but which changes the rate according to the amount of earnings so as to diminish the objections which apply to the gross earnings tax. By imposing this gross-net tax the old system, which is no longer defensible, is eliminated and the general system of income taxation is approximated as closely as practicable under our present conditions.

For that reason, gentlemen, I should say that you ought to give this question careful consideration. I know that it will affect some of the public utility corporations differently from others. To some it will be an immense boon to get rid of the special franchise tax; to others, which perhaps have been doing a little better in their ventures and which are not yet so heavily taxed, it may involve a more or less unwelcome change. But if you gentlemen are forward-looking and wise, as I am sure you are, you will realize that in the long run you can't attempt to escape your due proportion of taxation. What we need in this country and what we are getting today, especially from our big men, is the acceptance of the principle that every man should bear his fair share according to his capacity to pay. Don't forget that in the long run, especially in a democracy like ours, no class of people and no class of corporations can hope to escape its fair share of the liability. We have had several interesting examples of this truth in our recent history. The first one was that to which I alluded when I spoke of the special franchise tax. There was another matter dating back a few years ago, when the banks contested a law which attempted to put them on an equality with other businesses and fought it in the courts. Because some of them were national banks they managed to take advantage of that clause in our federal laws which prohibits the states from doing certain things to national corporations or nationally chartered bodies. What was the result? The banks had the law declared unconstitutional and were happy. But in the very next session Senator Davenport persuaded the Legislature to impose the capital tax. This was really one of the worst taxes you can think of, a reversion to the old discarded system of property taxation. What was worse, however, the capital tax had to be so framed that it applied not only to the banks themselves, but to the private bankers as well, thus causing discomfiture to a great many other people.

You all know the great excitement that ensued. After considerable negotiation I obtained for them the assurance that as soon as the section in the revised statutes was so changed as to permit them to conform to an equitable system the capital tax would be abolished. It took them about two years to come around. Finally they consented, as they saw that the Legislature was obdurate. When the banks came around the whole thing was quickly adjusted. As a result they are now on a par with other moneyed corporations and the capital tax has been abolished.

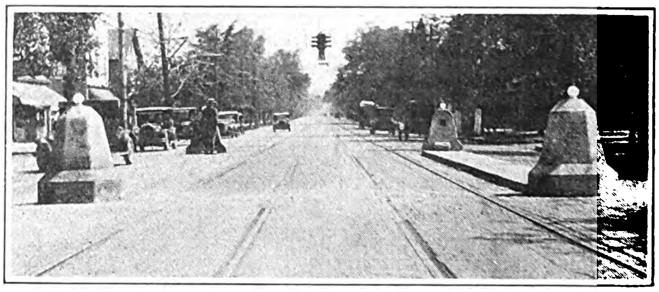
You can't expect, in a democratic community, which is so jealous of the rights of the individual, to erect yourself into a favored class. You have got to take your portion with everybody else.

From the point of view of prudence, with reference to the situation as it is going to develop in the next five or ten or fifteen years, and from the larger point of view of what is fair and equitable and forward-looking for the community as a whole, you ought to get behind this gross-net proposition and do away with all the absurd things in our laws today, including the special franchise tax.

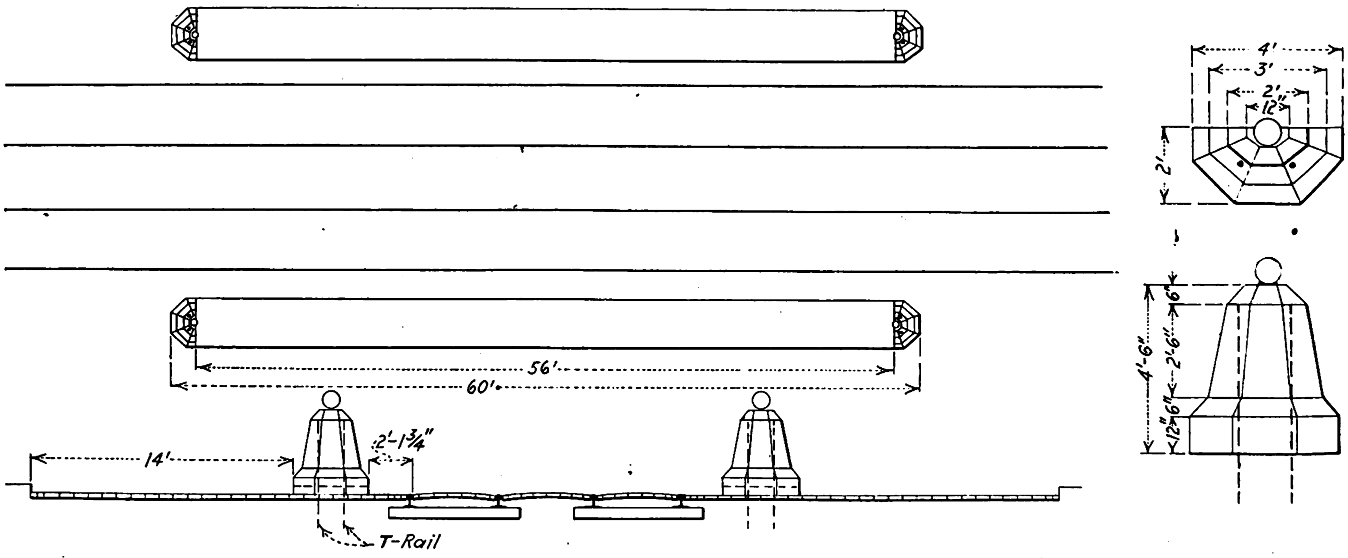
If you do this, and approach the subject fairly and loyally, you will be able to help solve both the state and the local tax problem and you will achieve something that will ultimately redound not only to your own benefit but to the prosperity of the community as a whole.

Loading Platform Meets Public Approval

LOADING platforms recently erected by the Wilkes-Barre Railway, Wilkes-Barre, Pa., have been heartily approved by the riding public. Four of these have been installed. Two are located at Fort Wells and Slocum Streets, Forty Fort, Pa., and two at Vaughn's Corners, Wyoming Avenue, Kingston, Pa. They are all of concrete, 4 ft. wide and 60 ft. long over abutments. The platform is raised 6 in. above the street surface. Abutments are octagonal in shape, 4 ft. 6 in. high and 4 ft. wide, reinforced by means of 80-lb. T-rail sunk about 4 ft. in the ground. Each abutment is illuminated with a single lamp incased in a round globe. This construction is rugged and presents a pleasing appearance.



Pleasing Appearance and Rugged Construction Are Combined in These Loading Platforms



Dimensions of Loading Platform Erected by Wilkes-Barre Railway

Berlin Carries Out Extensive Car Improvement Program*

FIRST ARTICLE

Complete Review of Car Development in German Capital Since Horse Cars Shows Change from Single to Double Truck Cars and Back to Four-Wheel Motor Cars and Trailers—Latest Type Equipped with Cardan Drive

By Wilhelm Pforr
General Manager Berlin Street Railway System, Inc.,
Berlin, Germany

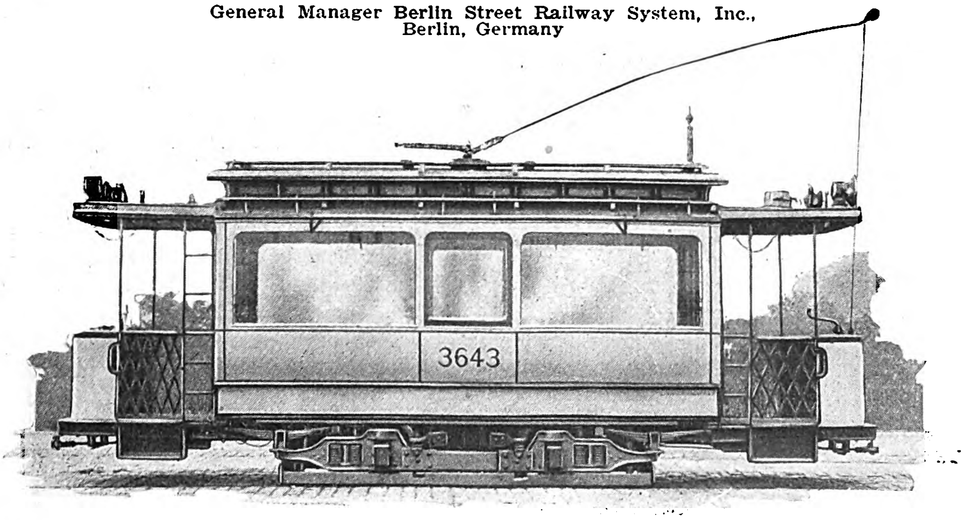


Fig. 1—Type of Motor Car First Used in Berlin. Weight, 22,000 Lb.; Length, 27 Ft. 11 In.; Wheelbase, 5 Ft. 9 In.

STREET railway cars in Berlin have undergone a continuous development since the time of horse cars. For such service, only small, light cars were used. When the lines were equipped for electrical operation, the greater part of the horse cars were used as trailers. For service as motor cars new single-truck cars were built with a wheelbase of 1.75 m. (5 ft. 9 in.) and equipped with two motors, each of 15 kw. (20 hp.). On account of the short radius curves on the line and the consequently short wheelbase necessary, the length of these first motor cars had to be kept down to 8.5 m. (27 ft. 11 in.). Braking continued to be done by hand, and the brakes on the trail cars were operated by a brakeman on the trailer. To reduce the number of employees this method of braking was abandoned in favor, first, of short circuiting electric brakes, followed by air brakes, for which electrical solenoid brakes were later substituted.

Fig. 1 shows such a motor car which was put into service at the time electrical operation was begun. It weighs 10 metric tons (22,000 lb.) and has seating and standing room for 48 passengers. It is shown equipped with a trolley pole, but at the beginning of electrical operation, for esthetic reasons, the installation of trolley wire was forbidden on certain streets, and cars strong enough to carry storage batteries had to be added to the rolling stock. Such a car is shown in Fig. 2 and its truck and wheel arrangement in Fig. 3. Its weight inclusive of batteries was 16 metric tons (35,200 lb.), and it had room for 28 seated and 35 standing passengers. When storage-battery operation proved impracticable, the batteries were taken out and the double-truck cars were equipped with trolley poles and operated over all lines of heavy loading. It developed then, however, that with only two driven axles these cars did not have sufficient traction to haul trail cars, but four motors were not put on, as at this time four-motor control had not been very well developed. Then, to improve their tractive effort, even when operated without trail cars, maximum traction trucks were installed, with total wheelbases and truck wheelbases as shown in Fig. 5.

Such a maximum traction car is shown in Fig. 4. It has room for 30 seated and 26 standing passengers and weighs 14 metric tons (30,800 lb.). About 600 cars of this type are yet in operation in Berlin. However, on account of their operating disadvantages and high operating and maintenance cost, they are being kept in service only until the time comes when they can be retired.

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*This series of two articles is based upon an article by the author entitled "Die Entwicklung des Wagenparks der Berliner Strassenbahn," in the *Zeitschrift des Vereines deutscher Ingenieure* for Nov. 13, 1926, supplemented by other information just received by ELECTRIC RAILWAY JOURNAL from Mr. Pforr.

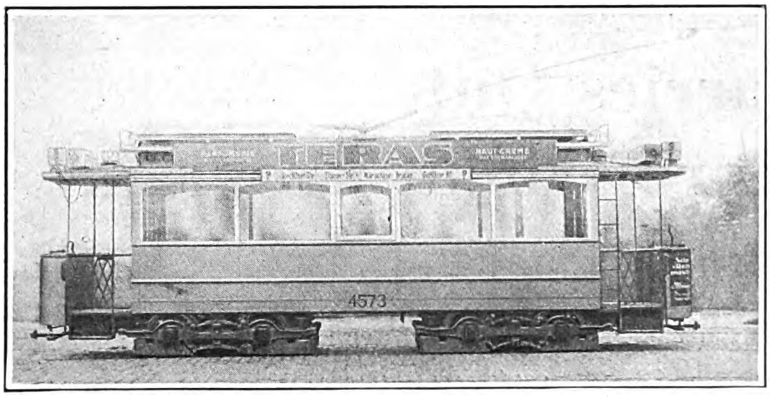


Fig. 2—Double-Truck Motor Car, Weight, 35,200 Lb., Originally Designed for Storage Batteries and Later Used with Overhead Trolley

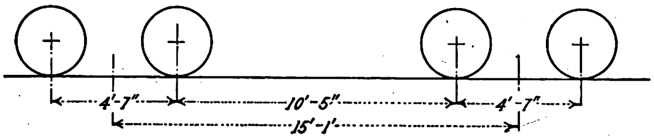


Fig. 3—Arrangement of Axles of the Motor Car Shown in Fig. 2 After Conversion for Trolley Operation

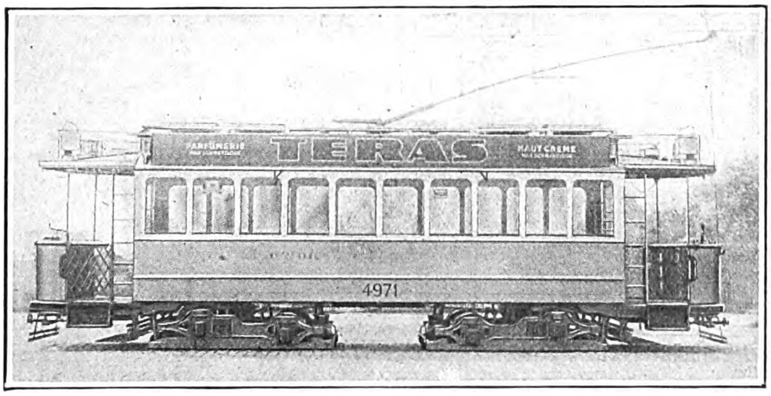


Fig. 4—Maximum-Traction Motor Car Truck of the Berlin Street Railway. Weight, 30,800 Lb. A Step in Car Development in Berlin Following the Design Shown in Fig. 2

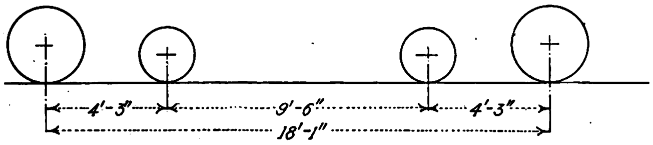


Fig. 5—Arrangement of Axles of the Motor Car Shown in Fig. 4

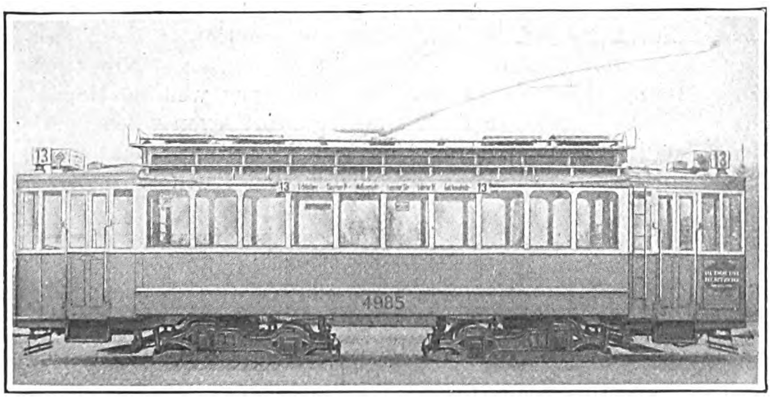


Fig. 6—Double-Truck Car with Inclosed Platforms Rebuilt from the Car Shown in Fig. 4. This Car Weighs 31,900 Lb.

On about 250 of these cars that appeared to be in the best physical condition the platforms were inclosed as shown in Fig. 6 and more powerful motors were installed. This car weighs 14½ metric tons (31,900 lb.) with 30 seated and 41 standing passengers, and its length was increased from 11 to 11.7 m. (from 36 ft. 1 in. to 38 ft. 5 in.). Cars of any greater length than this could not be run with safety in Berlin on account of the clearance at curves, and, moreover, with cars of larger capacity it is believed that two conductors would be required at many points along the line for proper collection of fares.

Of the cars shown in Fig. 1, the greater part have been scrapped, a few have been rebuilt and the remainder are used occasionally for extra service. Of those shown in Figs. 2 and 3, about 40 remain in service, but these will be retired as soon as substitutes can be provided.

During the past few years the Berlin Street Railway has been increasing the radius of its sharp curves. In all new construction a minimum radius of 15 m. (50 ft.) has been sought, and in most cases has been attained. Only in the entrance curves to carhouses in a few narrow streets have sharper curves than this been installed. With this improvement in the track, it was possible to increase the wheelbase of the two-axle cars from 1.75 m. (5 ft. 9 in.) to 3 m. (9 ft. 10 in.) and to build such cars with a length of 10 m. (32 ft. 10 in.) and a capacity of 24 seated and 43 standing passengers. Such cars are shown in Figs. 7 and 8. These were the first cars to be built with inclosed platforms, and since their construction all cars have been so equipped. The cars shown in Figs. 7 and 8 are equipped with two 39-kw. (52-hp.) motors each and weigh 13.3 metric tons (29,260 lb.). This is, of course, a large weight for a four-wheel car, but is cared for by motors of large capacity and rugged construction and by a truck with spring support between axle and truck and between truck and car body. About 200 of these cars are now in operation in Berlin.

The motors on these cars were the first in Berlin to be equipped with commutating poles, automatic ventilation and roller bearings. These three features have been continued in all of the cars used in Berlin since that time.

During the post-war inflation period it was not possible to add any more cars to the Berlin system, but some old cars, like those shown in Fig. 1, which seemed to be in good physical condition, were rebuilt to the type shown in Fig. 9. The system now possesses 250 cars of this type. It will be noticed that the truck side frames have been extended so as to reach under the inclosed platforms. This permitted an increase in length of the car from 8.5 m. (27 ft. 10 in.) to 10 m. (32 ft. 10 in.) In spite of this increase in length, the weight of the body is no greater than that in the old car shown in Fig. 1. This was made possible by the discontinuance of the use of heavy oak side sills in the body, which were no longer necessary with the extended spring base; by the substitution for the old motors of modern high-speed motors, and by the discontinuance of the use of the old wheel brakes. These had to be abandoned because the brakeshoe hangers were supported on the side frame of the truck and consequently in the new design were affected by the movements of the car body. As a result, the brakeshoes got too far away from the car wheels and interfered with the working of the hand brakes. As substitutes for the wheel brakes a drum brake was developed, this drum being mounted on the armature shaft and not being affected by the spring support of the car body. Fig. 10 shows a motor equipped with one of these brakes that is modeled after the brakes used on automobiles. This brake was described in ELECTRIC RAILWAY JOURNAL for Feb. 13, 1926.

THE NEW CARS

The reconstructed car shown in Fig. 9 was the forerunner of an entirely new design of car, of which during the past year the Berlin Street Railway has added 500 motor cars and the same number of trail cars. The new motor car is shown in Fig. 11. It has an arched roof and the framework, Fig. 12, is entirely of steel. The side sill in the reconstructed car, as shown in Fig. 9, is visible from the outside and in this car is a Z beam on which the car body rests. To these beams, which are strengthened by a strut frame, are attached the axle pedestals and the car side posts, as shown in Fig. 12. The car journals are equipped with S.K.F. roller bearings and these cars were the first to use this type of bearing in Berlin. The high-speed motors, as shown in Fig. 10, were also used with these cars for the first time. Such a motor has a capacity of 35 kw. at 800 r.p.m., and weighs 800 kg. (1,760 lb.), as compared with the earlier motors, which ran at 600 r.p.m. and required an 820 mm. (32¼ in.) diameter wheel, whereas the new motors could use a wheel of only 720 mm. (28¼ in.) diameter. This permitted so low a car floor that the usual riser between the platform and the inside of the car could be omitted.

In these cars as well as in the reconstructed cars, as already pointed out, the drum brake was substituted for the usual wheel shoe brake. As it does not operate on the wheels it is independent of the suspension of the car body, brings no side pressure on the wheels and journal boxes, and is lighter than the ordinary wheel brake. Moreover, it has the advantage that the braking material used can be an asbestos composition. The efficient operation of this brake, combined with the long life of the brake band, is such that electrical braking can be used exclusively in operation and the hand brake is required only to hold the car at a stop. On account of the small wear, it is necessary to change the wearing parts of the brake only at long intervals.

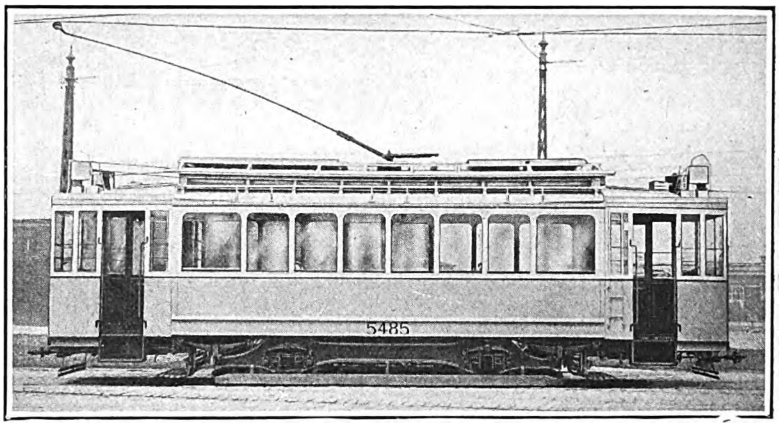


Fig. 7—This Car and That Shown in Fig. 8 Mark the Beginning of the Present Trend Toward Four-Wheel Cars with Extended Wheelbase in Berlin. The Weight of This Car Is 29,260 Lb. Its Wheelbase Is 9 Ft. 10 In.

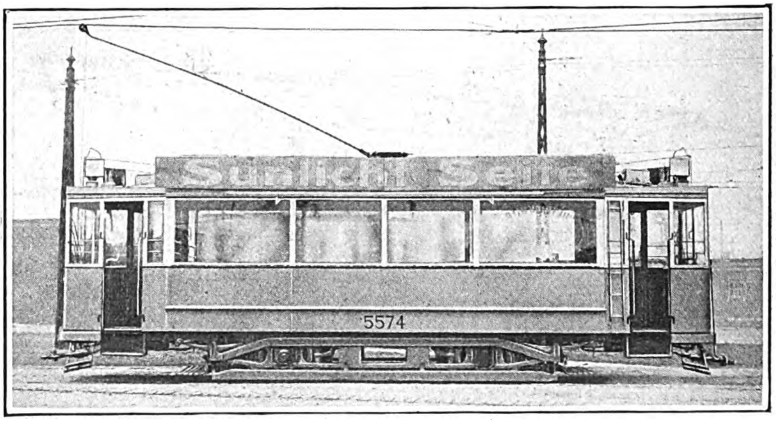


Fig. 8—A Modification of the Car Shown in Fig. 7 but with the Same Weight and Wheelbase

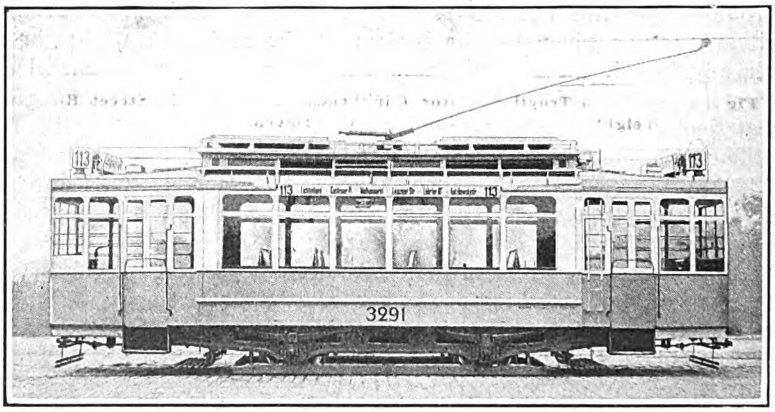


Fig. 9—Car with Long Inclosed Platform Rebuilt from That Shown in Fig. 1. The Weight Is 22,000 Lb. and the Wheelbase Is 9 Ft. 2 In.

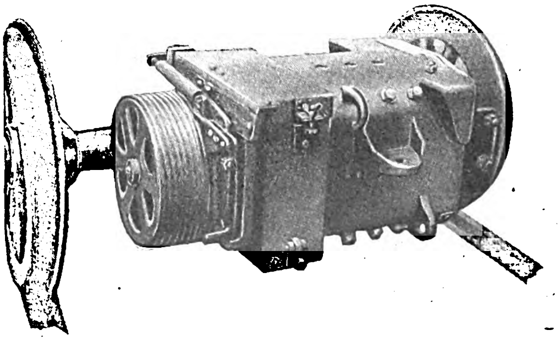


Fig. 10—35-Kw. (47-Hp.) Motor with Drum Brake on the Armature Shaft. This Motor Was Built for Use on the Motor Car Shown in Fig. 9

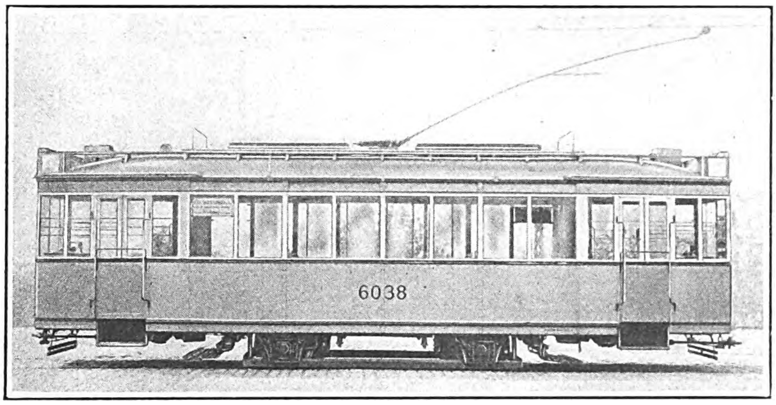


Fig. 11—The Last Type of Motor Car in Berlin in Which the Motors Are Hung on the Axles, and the Cardan Drive Is Not Used

This car is of all-steel construction with arch roof, but its principal feature of interest is the absence of a truck, the axle pedestals being attached to the body of the car. This car has a weight of 24,200 lb. and a wheelbase of 9 ft. 2 in., like that shown in Fig. 9.

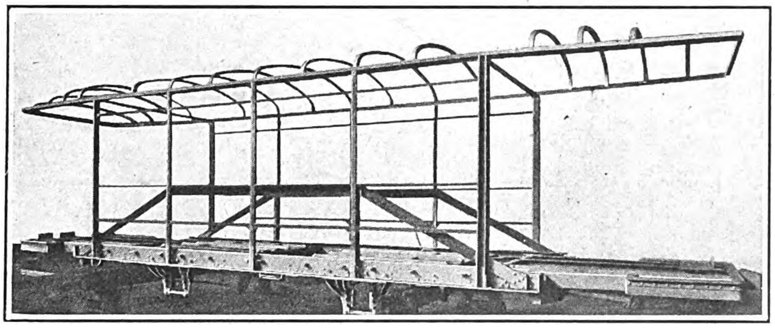


Fig. 12—Framing of the Car Shown in Fig. 11. The Side Sills Are Z Channels

On the trail cars the shoe brake has been abandoned, as on the motor cars. For the trailers the latest braking device is the so-called plier (or tongs) brake, which provides for the trailers the same kind of braking advantages as given by the brakes on the motor cars already described. An article on this brake, with chart showing method of application, appeared on page 174 of last week's issue of this paper.

The new motor cars, Fig. 11, weigh 11 metric tons (24,200 lb.) and have a capacity of 24 seated and 42 standing passengers. In the trailers there is room for four more standing passengers because of the absence of the control equipment. The low weight is due in part to the high-speed motors and in part to the absence of any truck. With the same passenger capacity, the new motor cars weigh 2 tons (4,400 lb.) less than the four-wheel cars shown in Figs. 7 and 8, and about 5 tons (11,000 lb.) less than the maximum traction truck cars, Figs. 4 and 5. To these advantages should be added that of the lower maintenance inspection required because of the new brakes and use of roller bearings.

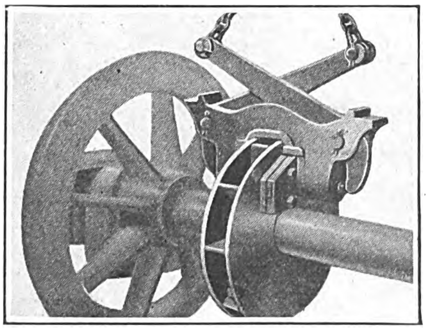
TRIALS WITH CARDAN DRIVE

In all of the cars so far described, the system of motor drive has been that in which the armature shaft is parallel with the car axle to which it is connected by spur gearing. This system of drive, which is common on most street railways, has notable objections, among them the fact that the drive is not entirely dustproof and does not operate in oil. Another disadvantage is that part of the weight of the motor is not spring supported, and this is bad for both the motors and for the track.

To overcome these disadvantages, an attempt has been made to use the system of automobile drive, known as the Cardan drive, which was first tried out by the Dortmund Street Railway under the direction of General Manager Albrecht, and about the same time was applied to some new cars on the Paris street railway system. Cars with this same type of drive have been in use also by the Berlin Street Railway, which for the last two years has had a car similar to that shown in Fig. 9 equipped with this type of drive. The method employed is that shown in Fig. 14. Ten of these Cardan drive cars are now being used with satisfaction by the Berlin Street Railway. The one which has been in regular service for two years does not show the slightest wear on the drive. The motors also, which are of the high-speed type up to this time have not given any trouble.

It should also be said that the Berlin Street Railway has been engaged in a study to see whether light-weight metal cannot be used to reduce the weight of trailers. For this purpose two trailers of the latest type built with framing made entirely out of light metal have been put in operation. It has been found that by the use of this metal a saving in weight of from 10 to 15 per cent has been secured, though the cost has been increased by about that same proportion. The ability of such metal to stand up under the conditions to which it is subjected has not yet been determined. Such ability will be made clear only by experience.

Particulars of the operation of the cars equipped with Cardan drive and the plans of the company as regards rolling stock for the immediate future will be treated in a following article.



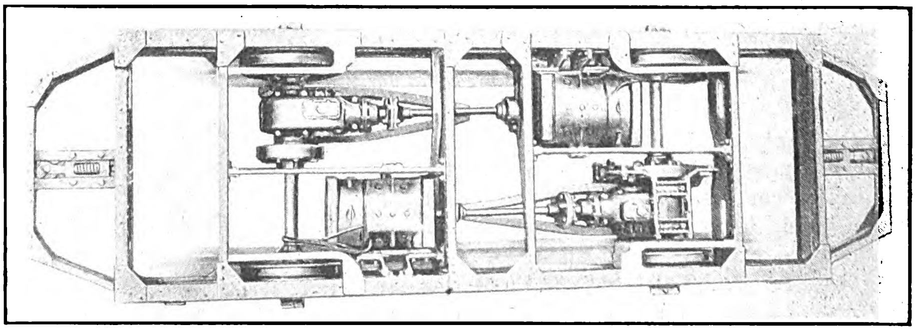


Fig. 13—(At Left) "Tongs" Type of Brake, Used on the New Trail Cars in Berlin. Fig. 14—(At Right) Floor Framing of Berlin Motor Car Equipped with Two Cardan Drive Motors

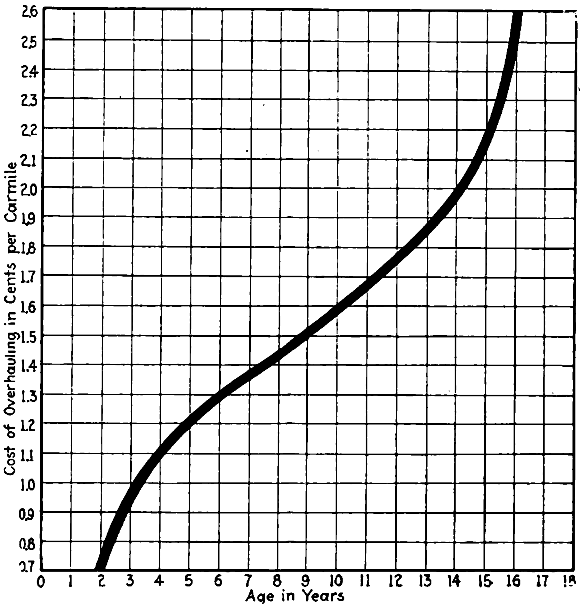
New Equipment Saves $1,528 Per Car Per Year[*]

By W. C. Bolt

Superintendent of Rolling Stock and Shops
Eastern Massachusetts Street Railway, Boston, Mass.

Experience of the Eastern Massachusetts Street Railway with Modern Rolling Stock Has Been so Satisfactory that 50 New Cars Will Be Bought This Year—Other Equipment Is Being Remodeled for De Luxe Service

IMPROVEMENT in cars and equipment on the Eastern Massachusetts Street Railway has stimulated travel, increased revenue and reduced operating cost. During the war the company found itself in receivership, thoroughly impoverished, with equipment of all vintages, an infinite number of types of cars, trucks and motors, most of which were worn out. In 1917 such improvements as limited funds permitted were inaugurated. Following reorganization and formation of the present company under control of a board of public trustees appointed by the Governor of the state, 250 single-truck safety cars of our own design were purchased and placed in operation. These cars were reinforced and were more substancial than the standard Birney car sold at that time. Some 450 existing double-truck cars previously operated by two men were prepared for one-man operation, through the addition of a conductor's valve which when pulled by a passenger applies emergency brakes, unlocks rear doors, and cuts off power through the line switch. By the latter part of 1921 practically all of the service on the 681 miles of track operated was being performed through one-man operation.



Overhauling Cost Increases Rapidly with Age of Cars

All of these cars have been modernized in so far as possible. All cars have been provided with highly efficient glass reflector type of headlights, automatic heat regulators, pneumatically operated doors, pneumatic sanders and illuminated destination and side route signs. Cumbersome drawbars and fenders have been removed and the fenders have been replaced by wheel guards which met with the approval of the State Department of Public Utilities. Reduction of noise has been given every possible thought, and it has been the endeavor to eliminate noise on all cars to the greatest possible extent.

The value of clean and well-painted rolling stock as a business getter was recognized. After five or six years the frequent painting of interior and exterior of cars has lifted the estimation of the company to a high level. All service cars, including snow equipment, are likewise kept in first-class paint condition, as it is not intended that a single piece of equipment should appear shabby on the streets.

Within the last several years, 75 double-truck, low-level light-weight cars were added. Believing that service, particularly on longer routes, could be made still more attractive, nineteen light-weight, double-truck cars were provided with specially designed Spanish leather seats, cushions of which are 8 in. thick, double spring construction. Backs are of the individual divided type with curved tops. Seat spacing was increased from 28½ in. to 31 in. to provide greater kneeroom. The cars were provided with linoleum floor covering, and the piping in the vestibules was completely inclosed.

Cars of this type have been placed in service on the Lawrence-Boston route, distance one way 23.2 miles; on the Lowell-Boston route, distance one way 24.2 miles, and on the Brockton-Boston line, distance one way 14 miles. The Lowell-Boston service was started in October of last year. The Lawrence-Boston and the Brockton-Boston line have just been started with de luxe service.

The first de luxe route established has shown very satisfactory results, and it is expected that the annual earnings of this route, about $250,000, will be increased at least 8 per cent judging from the results of the first four months of operation. There is no question in our minds but that this improved service will attract patronage. The management is so firmly convinced that this improvement in car service will produce pleasing results that it has authorized the remodeling of a total of 50 cars along these same lines for use on other routes which for convenience we might call "suburban routes" as distinguished from city routes or interurban routes.

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[*] Abstract of a paper presented at the midwinter meeting of the New York Electric Railway Association, New York City, Jan. 25.

In addition to this, the purchase of 50 additional double-truck light-weight de luxe cars has just been authorized, and deliveries are expected early this year. These cars will likewise be provided with a similar type of de luxe seats and Pullman type of rubber floor covering. They will be finished on the interior in genuine mahogany, and will be lighted with five Pullman type dome fixtures, each fixture containing a 94-watt compensated lamp.

Upon delivery of these 50 cars, the company will then have 100 de luxe trolley cars which will take care of the larger portion of the so-called suburban service. The new cars will replace 50 old-style heavy double-truck cars, and will still further improve the high standard of equipment which the management has fixed.

Purchase of these 50 de luxe cars was predicated upon a study made of economies which might result from their purchase as well as their added business getting value. Every company has car equipment of various styles and ages, and usually the older cars are less modern and are more expensive to operate. This was true in our case.

It has been our custom to keep accurate records of the cost of reconditioning every car at the expiration of the predetermined mileage interval, which will be later referred to. Individual car reconditioning costs were summarized by car group, and the results of this summary are given below. An accompanying chart shows this graphically.

SUMMARY SHOWING AVERAGE TOTAL COST AND COST PER CAR-MILE OF OVERHAULING OR RECONDITIONING ELECTRIC PASSENGER CARS CLASSIFIED BY CAR TYPE OR GROUP

Car Group	No. Cars in Group	Weight Per Car, Lb.	Age in Years	Average Cost	Miles Operated Per Overhaul	Cost Per Car-Mile, Cents
A	30	32,000	2	$749.00	100,000	0.75
B	2	33,640	2	749.00	100,000	0.75
C	25	32,000	4	1,070.00	100,000	1.07
D	101	42,880	9	1,402.00	100,000	1.40
E	100	46,280	9	1,402.00	100,000	1.40
F	74	43,200	13	1,842.00	100,000	1.85
G	43	43,900	16	1,956.00	75,000	2.60

In order to arrive at an average annual saving in maintenance per car for each new car placed in service, the expense of maintaining an old type car for a service period of 400,000 car-miles, equivalent to eight years of time, was compared with the cost of maintaining a new light-weight car—all based upon the cost figures as previously set forth and as based upon our own cost records.

COST OF CAR MAINTENANCE

Old Type Car (400,000 Car-Miles)

Initial cost of overhaul to make old car reliable		$2,600
Cost of overhaul at end of....	First 100,000 miles at 2.6 cents per car-mile	2,600
	Second 100,000 miles at 2.6 cents per car-mile	2,600
	Third 100,000 miles at 2.6 cents per car-mile	2,600
	Fourth 100,000 miles at 2.6 cents per car-mile	2,600
Total cost of overhauling (400,000 car-miles)		$13,000

New Light-Weight Car (400,000 Car-Miles)

Initial Overhaul	New Car	0
Cost of overhaul at end of	First 100,000 miles at 0.75 cent per car-mile	$750
	Second 100,000 miles at 1.07 cents per car-mile	1,070
	Third 100,000 miles at 1.20 cents per car-mile	1,200
	Fourth 100,000 miles at 1.40 cents per car-mile	1,400
Total cost of overhauling (400,000 car-miles)		$4,420
Total saving 400,000 car-miles		$8,580
Total saving per car-mile, cents		2.145
Total saving per car per year		$1,072

The saving in energy on a basis of 50,000 miles per car per year for the light-weight double-truck car over the old type car and at the rate for energy of 1 cent per kilowatt-hour was calculated at $455.80 per year.

It was also necessary to amortize the original value of the old type car to the extent of 20 per cent of its original value ($6,000 × 20 per cent), or $1,200 over the period of eight years or $150 per year.

The combined annual saving in energy and in car maintenance was, therefore, as follows:

Annual saving in maintenance of equipment	$1,072.00
Annual saving in energy	455.80
Total annual savings	$1,527.80
Fixed charges for each new car:	
Interest at 6 per cent on $15,000	$900.00 per year per car
Depreciation on basis of twenty-year life, 5 per cent compounded annually	405.00 per year per car
Amortization of 20 per cent of original value of old car ($6,000 × 20 per cent) or $1,200 over a period of eight years	150.00 per year per car
Total	$1,455.00 per year per ca

The annual savings, therefore, in energy and in maintenance of equipment for each new car placed in service, and for each corresponding old type car retired from service, will more than pay for the fixed charges. In other words, the cost of service would actually be reduced, and no effect has been given in these calculations to other important economies resulting from this replacement, such as reduction of cost of general carhouse labor and material, including brakeshoes, lubrication, armature maintenance, etc., and the intangible savings in maintenance of track.

IMPROVEMENTS IN CAR MAINTENANCE

Coincident with the modernization of shops and car equipment as earlier set forth, the company proceeded to inaugurate modernized maintenance practices. Thirty thousand car-miles was first established as a mileage interval between general reconditioning and overhauling. This interval was later increased to 45,000; as the condition of equipment continued to improve, the interval was again increased to 60,000, later to 75,000, and 100,000 car-miles has now been established as the reconditioning period.

Every passenger car has been equipped with Economy watt-hour meters complete with car inspection dials, and these meters accumulatively register the energy consumption. The meters are used as a basis for both carhouse inspection, which is equivalent to an inspection for every 1,000 miles of car service, and for the 100,000 car-mile shop reconditioning. On the first of each month, the meter dial readings are recorded by the local carhouse foreman, and these readings forwarded to the general rolling stock office on a form provided for that purpose. One point advance on the meter dial is equivalent to 4,000 car-miles. Accordingly, when a car has reached 25 points on the meter, it has operated the equivalent of 100,000 car-miles, and therefore is due for reconditioning. When the car is reconditioned, the locked dial is again set back to zero. Considerable economies have resulted from the use of this plan, as individual car mileage statistics are entirely eliminated with the corresponding saving of some 26 clerks formerly engaged in this one operation. Cars which are in regular service become due for shop reconditioning in approximately two years. Other cars which are in infrequent service, perhaps cars of older type, do not become due for reconditioning within three or four years. This system also enables us accurately to forecast our annual budget.

The department of rolling stock and shops is continuously engaged in the scientific study of life of various car parts with consequent view of securing materials of such design and construction that will give maximum life to co-ordinate with the 100,000 car-mile overhaul basis.

Prior to 1920, it was the practice to make general repairs to cars in each of the larger carhouses. Such major repairs have been eliminated at carhouses, and have been concentrated at the shops, where work can be accomplished by specialists. Division carhouse work now consists almost entirely of inspection, cleaning, lubrication and replacement of rapidly wearing parts, such as brakeshoes, trolley wheels, controller fingers, etc.

Modern practice, together with modernization of equipment, has contributed largely to our substantial reduction in armature failures. In 1920 we were having armature failures at the rate of 475 per month, these failures occurring largely on motors of the old types. At the present time our failures aggregate 55 per month, or about 1 per cent of the total in service.

Every armature is dipped and baked and retested every 100,000 car-miles, and this procedure has had very marked effect upon armature troubles.

Similarly, a thorough examination, testing, dipping and baking of field coils every 100,000 car-miles has reduced field coil failures from some 300-odd per month in 1920 to practically 100 per cent performance.

At the period of reconditioning of car equipment, it is the practice of the company to remove all equipment parts, and thoroughly to overhaul and test each individual part. Motors which are found to have excessive wear in the axle bearing housings are welded and rebored to restore original conditions. It is considered of vital importance that armature and axle bearing housings be continuously in first-class condition, this resulting in ultimate long life of axle and armature bearings.

The company has entirely discontinued the practice of rebabbitting axle and armature bearings, and uses full brass bearings almost exclusively, with the exception of high-speed GE-264 and Westinghouse-508 motors. Every car at the overhaul period is equipped with new full brass axle and armature bearings and, barring accidents, these bearings do not require replacement until the next general overhaul period. This plan practically eliminates the necessity of installing armature or axle bearings in divisional carhouses. During the first ten months of this year 360 pairs of new axle bearings were installed in divisional carhouses, or an average of 36 pairs per month. This is equivalent to installing new bearings on only 4½ cars per month, or at the rate of one-half of 1 per cent per month of all axle bearings in service.

Within the past year and a half very careful investigation of air brakes on all passenger equipment has been made, with the purpose of bringing the brake performance on each car as near as possible to that of the light-weight double-truck car equipped with variable load brake compensators.

Maintaining car reservoirs in a safe condition is considered of sufficient importance to warrant more than the usual superficial examination for defects. Accordingly, a hydrostatic and hammer test of all tanks is included as a part of the regular car overhauling schedule.

A car repainting schedule of from 33,000 to 50,000 car-miles has been established, which operates to bring in regular cars for paint every twelve to eighteen months, while those in irregular service on this basis receive paint approximately every eighteen to 24 months. This practice of repainting cars on a mileage basis is working out very satisfactorily. The frequency with which cars are repainted has been made possible by reason of some very substantial reductions in car painting costs. Our general painting schedule has been augmented within the last year to include the use of the so-called two-color scheme.

In 1920 the cost of repainting a 44-ft. double-truck car was approximately $257, whereas today it is costing less than $100 for complete repainting of a car interior and exterior.

The following tabulation indicates the total cost of maintaining rolling stock exclusive of depreciation and retirement for the years 1918 to 1926, inclusive:

Year	Total Cost of Maintaining Rolling Stock Exclusive of Depreciation and Retirement	Cost Per Car-Mile, Cents
1918	$1,361,000	5.02
1919	1,485,000	5.69
1920	1,418,000	6.20
1921	915,000	4.65
1922	857,000	4.42
1923	797,000	4.06
1924	662,000	3.60
1925	556,000	3.04
1926 (eleven months)	533,000	3.14

The costs above indicated exclude our fixed charges, such as depreciation and retirement of equipment, and represent expenditures recorded according to the Interstate Commerce Commission classification of accounts:

29—Superintendence of Equipment
30—Maintenance of Car Bodies, Trucks and Air Brake Equipment
32—Maintenance of Brakes and Service Cars
33—Maintenance of Electrical Equipment
36—Shop Tools
37—Shop Expense
39—Miscellaneous Equipment

It should be noted that while the cost of maintaining equipment as a whole is now about 3 cents per car-mile, our cost for maintaining single-truck safety cars as distinguished from the whole is 1.6 cents per car-mile.

It may be pointed out that more than 75 per cent of the total car mileage is operated with double-truck cars, the larger portion of which are of a type weighing approximately 44,000 lb.

Car pull-ins are generally used to indicate the reliability of service. Comparison of pull-in records as between several properties is always difficult, and care must be exercised when such comparisons are made. Comparison, however, on any one property can well be considered as an indication of relative performance.

In 1920 our records indicate a pull-in for every 1,550 car-miles of service; this mileage interval was increased to 1,884 in 1921, and has been increasing each year, and for the first eleven months of 1926 the average was:

Year	Total Maintenance Pull-Ins	Average Maintenance Pull-Ins Per Month	Car-Miles Per Maintenance Pull-Ins
1920	14,436	1,203	1,550
1921	10,423	869	1,884
1922	4,972	414	4,035
1923	2,981	248	6,745
1924	1,864	155	9,994
1925	947	78	19,668
1926 (eleven months)	627	53	27,110

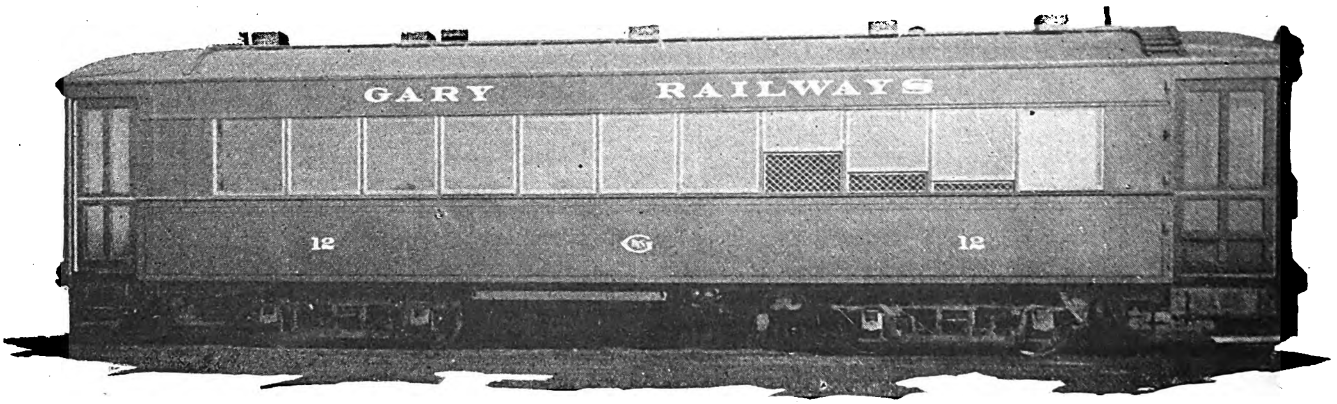
The pull-in record is carefully watched by each of the thirteen operating managers, comparative records being sent out each month. It is our endeavor to see that all divisions are as good as the best, and each manager is keenly interested in having his division at or near the top.

Seven Modern Light-Weight Cars for Gary Railways

New Equipment Part of Extensive Rehabilitation and Modernization Program Undertaken During Past Two Years—Light-Weight Steel Rolling Stock Is the Goal of This Utility

RECENTLY another step forward in the interest of operating economies, passenger comfort and safety was completed by the Gary Railways when it received seven new light-weight, one-man cars. This new equipment was ordered last June from the Cummings Car & Coach Company of Paris, Ill., and is soon to be placed in operation on the 10-mile interurban division between Gary and Hammond, Ind., to give a twenty-minute service.

While the new cars for the Gary-Hammond line closely resemble the type put into service last July between Gary and East Chicago, they embrace many new features. Whereas cars of the old two-man type weighed more than 50,000 lb. each, the new cars tipped the beam at only 37,000 lb. Besides being lighter in weight and much more attractive in appearance, this new equipment is expected to effect a material saving in operating expense not only with respect to maintenance and repairs but also in reduced platform and power expense.



New Interurban Cars for Gary Railways

These modern cars, weighing only 37,000 lb., have replaced two-man, 50,000-lb. cars on interurban line between Gary and Hammond, Ind. Each car cost $17,000.

The new interurbans are propelled by four GE-247 motors of 40 hp. each and have a free running speed of about 45 m.p.h. The low-hung frame and headlinings insulated with felt help to reduce noise in operation.

The cars are equipped with wheels of small diameter in order to do away with the high step, and there is a ramp in the vestibule at either end which lowers the distance from the street to the main body floor level by several inches.

With their low, streamline body construction, attractive orange color, and wide letterboard above the windows, these cars present a striking and pleasing appearance. The interiors are finished in mahogany, the floors are covered with green battleship linoleum and the ceilings are painted an ivory color, giving a light, clean and attractive aspect. Seats accommodating 46 passengers are upholstered in green plush and equipped with deep, easy-riding springs. Directly over the aisles are mounted dome lighting fixtures of Pullman car design. The wide, clear-vision windows have been given a unique touch by making the sash of brass. This feature tends to exclude cold air. In the motorman's compartment all the unsightly control apparatus and piping have disappeared behind unobtrusive cabinets. All seven of the new cars are equipped with sliding doors and automatic treadle exits.

With the installation of the new interurban cars, the Gary Railways will have completed a substantial portion of its extensive program of rehabilitation and modernization. During the past year twelve new modern cars costing approximately $200,000 will have been purchased and placed in operation. Modern, light-weight, economically operated steel equipment is now being operated over every one of the company's four interurban lines.

Use of a chemical weed killer was begun by the Illinois Traction Company in 1924. The results were so successful that chemical weed extermination has now been made standard over all divisions of the Illinois system.

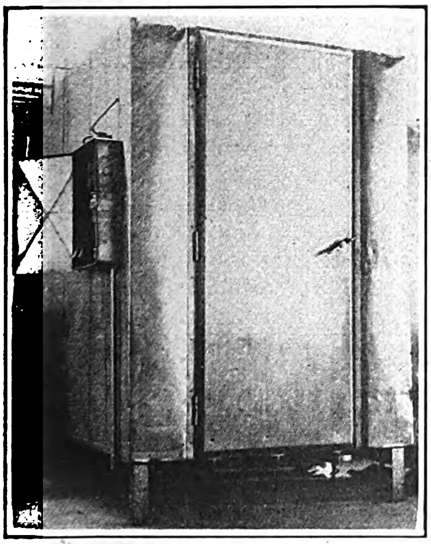
PRINCIPAL SPECIFICATIONS OF THE NEW GARY CARS

Type of car	Light-weight, double-end, one-man interurban
Seating capacity	46
Weight:	
Car body	17,600 lb.
Trucks	11,000 lb.
Equipment	8,400 lb.
Total	37,000 lb.
Bolster centers, length	21 ft. 0 in.
Length over all	44 ft. 8½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8¼ in.
Height, rail to roof	10 ft. 9½ in.
Body	All steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Armature bearings	Sleeve
Axles	Forged steel, 4-in.
Bumpers	Channel
Car signal system	Faraday high voltage
Car trimmings	Statuary bronze
Center and side bearings	Cummings Car & Coach
Doors	Sliding
Door-operating mechanism	National Pneumatic
Fenders	Steel pilots
Gears and pinions	General Electric
Hand brakes	Drop type
Heater equipment	Railway Utility
Headlights	Golden Glow
Journal bearings	3¾ in. x 7 in.
Journal boxes	Cummings Car & Coach
Lightning arresters	General Electric
Motors	Four GE-247, 40-hp., inside hung
Paint	Detroit Graphite Co.
Rear exit treadle	National Pneumatic
Registers	Ohmer
Sanders	Ohio Brass
Sash fixtures (brass)	O. M. Edwards
Seats	Hale & Kilburn reversible
Seating material	Green plush
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	General Electric
Trolley wheels	General Electric
Trucks	Cummings Car & Coach, MC-62
Ventilators	Nichols-Lintern
Wheels	Davis steel, 26 in.

Maintenance Notes

Asbestos-Incased Baking Oven

RADIATION of baking oven heat has been reduced at the Norfolk shop of the Virginia Electric & Power Company by the construction of an asbestos-incased oven designed and erected in the shop under the supervision of the master mechanic, T. W. Madison.



Neat and Substantial Appearance of Asbestos-Covered Baking Oven Used in the Norfolk, Va., Shop

This oven is 5 ft. 3 in. wide, 5 ft. 6 in. deep and 6 ft. 9 in. high. It is of all-metal construction. The corner, roof and door framing are made of 3-in. x 3-in. steel angles, riveted together. The floor framing consists of 3-in. tees. All cross framing and bracing is made of $1\frac{1}{4}$ angles. This angle framing is covered entirely with No. 16 sheet steel. A layer of asbestos wool 1 in. thick is placed outside of this metal on all six sides of the oven and is held by an outer covering of $\frac{1}{16}$-in. sheet steel. The seams of these plates are covered with $\frac{1}{8}$-in. x 1-in. metallic strips fastened by means of machine screws. A substantial door, 3 ft. wide, provides for easy entrance and exit of the armatures and field coils.

Pipe racks for the support of the field coils undergoing the baking process are installed 4 ft. above the floor inside of the oven near the back. Two banks of Consolidated Car Heating Company's double-coil car heaters, four units on each side of the oven, provide the necessary heat. They are controlled from a metal cabinet located outside the oven, which has four switches and four fuses to permit of four-step heat adjustment. The first step gives a maximum oven temperature of 100 deg. F., the second 150 deg. F., the third 225 deg. F. and the fourth 275 deg. F.

This oven has a capacity of approximately 25 field coils and three railway motor armatures. All armatures are placed in the oven and removed from it by means of a Frankline crane. The oven was made high enough to allow clearance for the entrance of the crane boom.

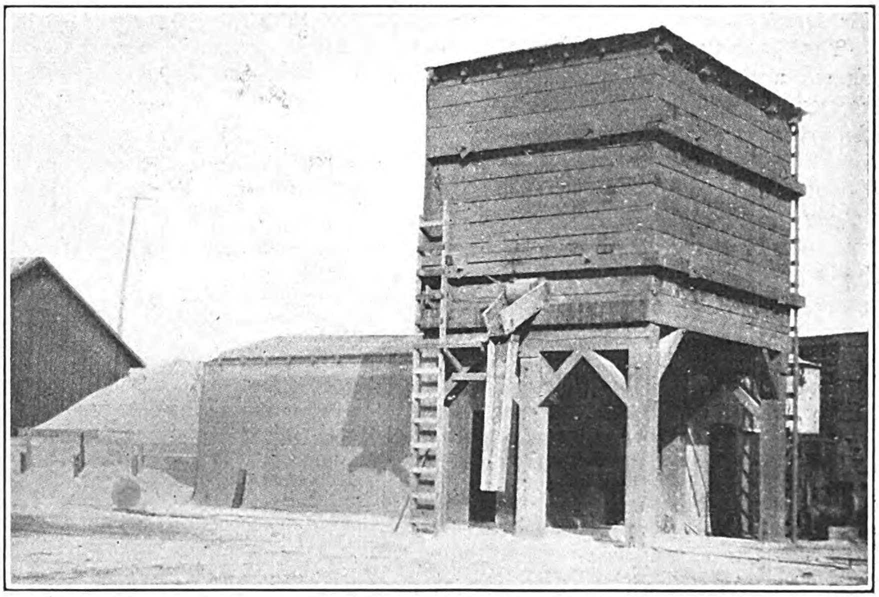
This oven has supplied a quick and effective method for the handling and the baking of armatures and field coils.

Sand Drier of Large Capacity

SAND used by the various departments of the Los Angeles Railway is dried in a rotary kiln at the materials yard of the way and structures department. This plant has a capacity of about 100 tons of sand a day. It is entirely machine operated, the only attention required being the breaking down of the supply of piled up wet sand.

In the drier wet sand is passed through an internally heated drum, placed at an angle of 10 deg. so that the sand flows through by gravity. The wet sand is taken from the pile outside by a bucket conveyor and carried to the head of the rotary, which is about 8 ft. above the floor of the plant. There are two concentric drums, the outer approximately 4 ft. in diameter and 10 ft. long. In this drum is another of equal length, 2 ft. in diameter. This is supported by spokes between it and the outer one. Both are rotated by an electric motor drive in a manner similar to that used on drum concrete mixers. At the lower end of the inner drum are gas jets for directing an intense flame up through the cylinders, while the upper end is connected with a flue leading outside.

Sand from the hopper supplied by the bucket chain conveyor is fed into the upper end of the outer drum. It flows by gravity to the lower end,



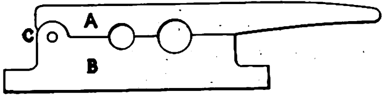
Sand Drying Plant of Los Angeles Railway Has Capacity of 100 Tons Per Day

Its operation is continuous and automatic, the wet sand being fed by bucket conveyor to an inclined drum kiln, out of which it falls into buckets of another chain conveyor, which carry it to the loading bin.

out of which it falls into buckets of another chain conveyor. These empty the now dry sand into a large hopper bin located over two side tracks. Openings in the bottom of this bin permit the controlled loading of two supply cars at a time. The whole outfit is contained in a frame building.

Device for Rounding Copper Sleeves

IT IS quite general practice among electric railways to use a sleeve over stranded conductors where they fit into terminals. For this use both the inside and outside dimensions of the sleeve must be maintained within desirable limits. Where seamless brass tubing is used both inside and outside diameters can be specified, so that the inside will fit the conductor accurately and the outside will fit the coil terminals or brush-holder lugs.



Device for Shaping Soft Copper Sleeves for Installation on Leads

Seamless brass tubing is quite expensive and some railways have had serious delays in getting delivery. Soft rolled copper is usually available as scrap from other electrical repair operations and has been used to advantage for these sleeves. This material, being soft, yields easily and so some method of rounding the sleeves after they are installed is necessary, as they will become distorted.

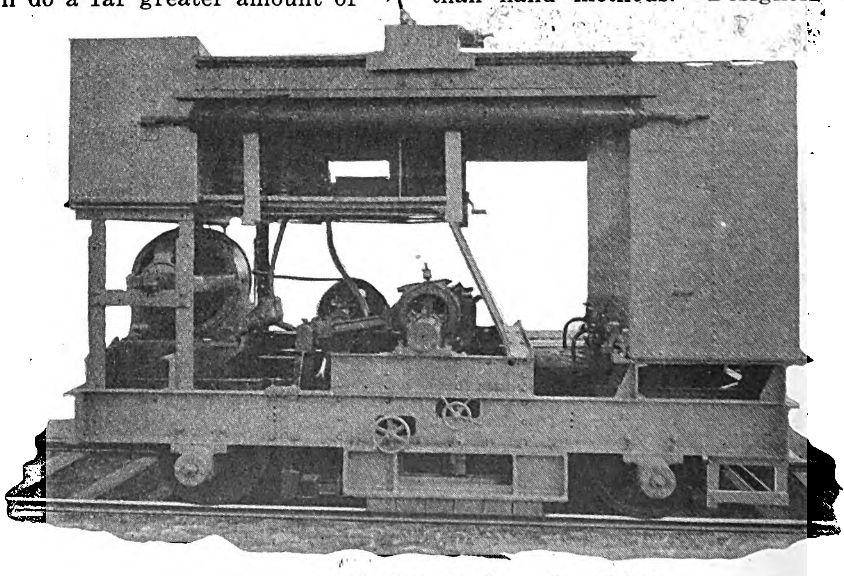
The accompanying illustration shows a device for rounding such copper sleeves which is in use in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. The upper member, marked *A*, has an extension to be used as a handle. This is hinged to the lower member at *B*, the lower member being screwed to a bench so as to hold it firmly in position. The two members *A* and *B* are fitted with several half poles of different diameters as are required, the two sections being arranged so as to register accurately. With a sleeve installed on the end of a lead it is placed in one of the holes corresponding to its outside diameter and the upper member of the device is brought down sharply, so as to produce a hammerlike blow. This equalizes the diameter of the sleeve and insures an accurate fit in the round hole of the terminal or lug to which it is to be applied.

> *"Save the surface and you save all." Another reason why you should dip and bake your armatures.*

New Equipment Available

Heavy-Duty Reciprocating Grinder

FOR use by the larger electric railway companies which are troubled seriously with large quantities of corrugated rail, the Railway Track-work Company, Philadelphia, Pa., has just placed on the market a heavy-duty reciprocating rail grinder. Present practice of electric railway companies is to grind out corrugations as quickly as possible so as to insure that the amount of corrugated rails does not become excessive. The new track grinder will do a far greater amount of work than smaller grinders, so that the cost is reduced.



New Type of Heavy-Duty Reciprocating Grinder

The new machine is arranged with six grinding bricks on each rail. The reciprocating movement for the grinding is furnished through a rocker arm so as to give an 8-in. stroke. A 50-hp. motor is used for the driving and 150 strokes per minute are produced at the grinding surface.

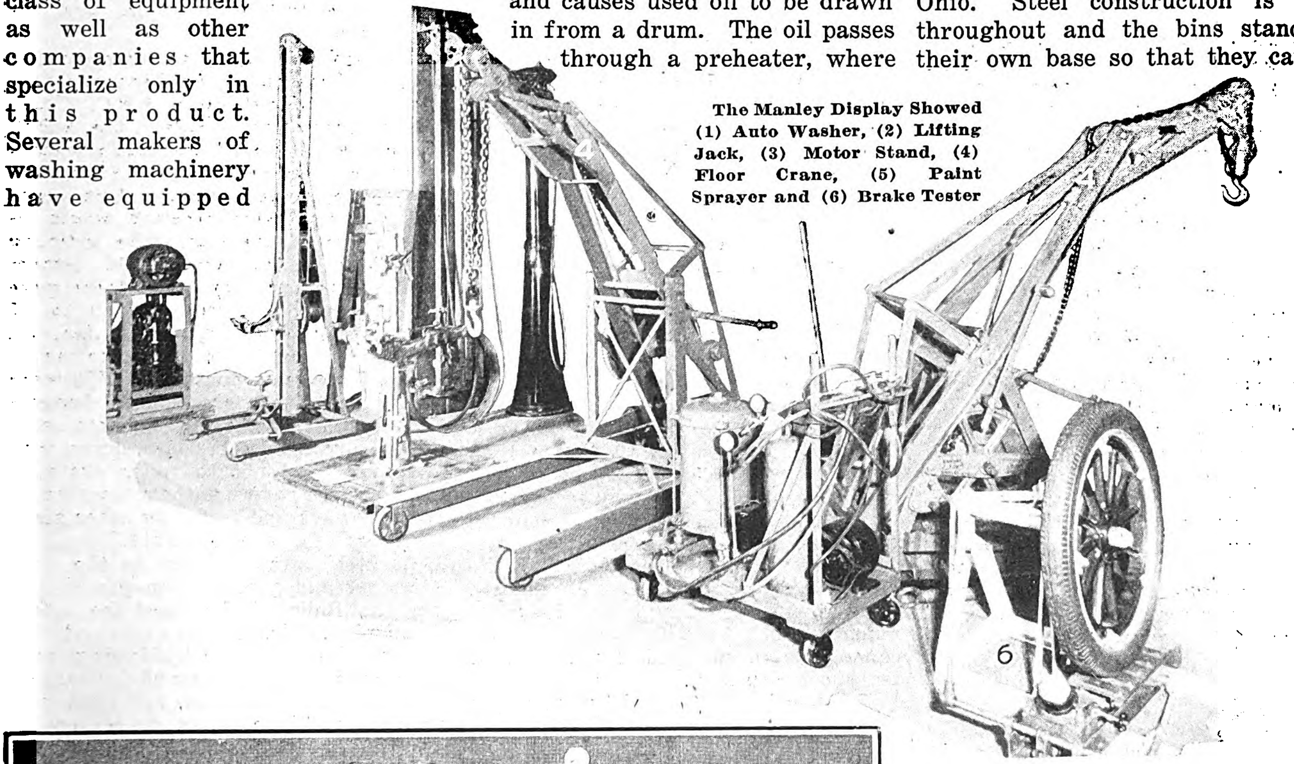
In order to provide a convenient water supply for the grinding the new machine has two storage tanks, which provide a total of 1,000 gal. The grinder has also been arranged so that it will operate as a self-propelled unit, and for this purpose a standard 25-hp. motor has been provided. The complete outfit weighs about 20,000 lb. and for ordinary work a crew of three men is sufficient.

Equipment Suitable for Bus Maintenance Shown

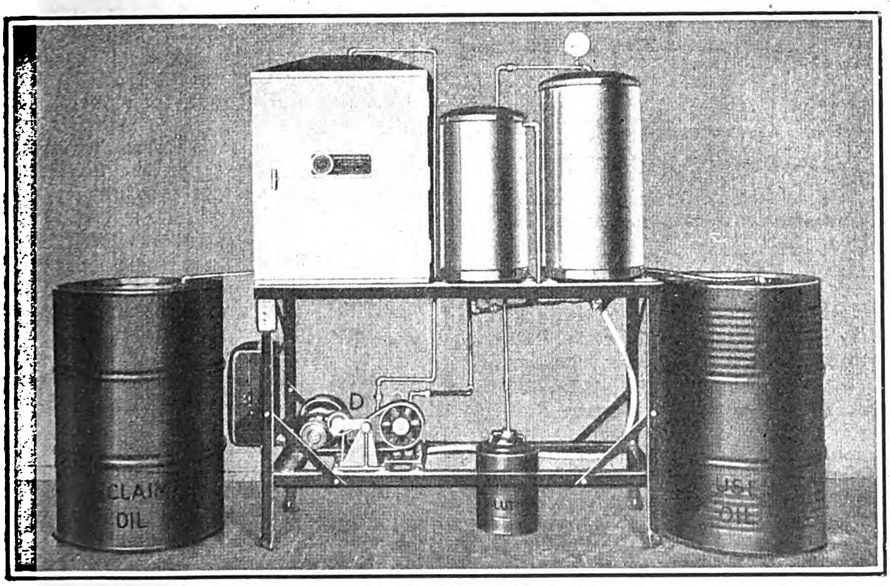
SHOP tools and fixtures for servicing of heavy automotive equipment was shown at the annual Automobile Show held in New York Jan. 8 to 15. The equipment was of particular interest to electric railway men who are operating buses because of the attention paid to maintenance problems. Servicing equipment shown covered a wide variety of types and uses. Jobs which are ordinarily done by hand on a bus chassis were demonstrated to show the use of maintenance tools in the various working exhibits. In most cases new equipment resulted in a considerable saving in time and labor and gave more uniform results than hand methods. Designers of apparatus were awake to the fact that maintenance service requires sturdy construction in order to give long life.

The provision this year for a shop equipment section at each of the various automobile shows throughout the country is sure to prove of educational value to electric railway personnel, since there will be an opportunity to see the various pieces of apparatus used for maintaining automotive equipment in actual operation. Because of its general utility value to a bus repair shop, compressed air was a prominent factor at the show in New York. Equipment shown demonstrated the saving in time and labor that results from the use of air for paint spraying, cleaning operations and forcing methods.

Car washing machinery was one of the leaders of the show. Air compressor companies exhibited this class of equipment as well as other companies that specialize only in this product. Several makers of washing machinery have equipped their products so that compressed air is made available for other operations, such as tire inflation, air cleaning and spraying. A new fluid dynamometer exhibited for testing engines provides a quick and easy means for measuring the horsepower.



The Manley Display Showed (1) Auto Washer, (2) Lifting Jack, (3) Motor Stand, (4) Floor Crane, (5) Paint Sprayer and (6) Brake Tester



New Oil Reclaiming Equipment

> *"99-44/100 per cent pure" should apply to your wool waste for motor bearings.*

Another piece of equipment of particular interest to electric railway maintenance men was the oil reclaimer exhibited by the Skinner Automotive Device Company, Inc., Detroit, Mich. With this system a pump maintains a constant vacuum and causes used oil to be drawn in from a drum. The oil passes through a preheater, where it is warmed, and then enters a rectifier tank, where it is heated and aerated until the liquid impurities are distilled out. The impurities pass as a vapor into the preheater, where they finally are condensed and collected.

The refined oil in the tank is conducted to the preheater, where it flows into a chamber. Heavy solid particles settle out and are deposited in a drum. The oil is then delivered to the top of a filter chamber and passes over a series of filters to remove the remaining dirt. The oil as finally purified drains by gravity into a drum.

A revolving bin for economical storage was displayed by the Wellston Manufacturing Company, Wellston, Ohio. Steel construction is used throughout and the bins stand on their own base so that they can be located as desired. Each section revolves independently of the other and can be rotated in either direction. A patented stabilizing feature prevents sagging and getting out of line due to heavy load.

A very complete display of equipment suitable for bus maintenance was shown by the Manley Manufacturing Company, York, Pa. The display included portable floor cranes, motor stands, auto washers, tire changers, forcing presses, lifting jacks, paint-spraying equipment and a brake tester.

The brake-testing equipment shown, while simple in construction, is sturdy enough for most bus garages. This tester reverses conditions from the standard method by providing a moving platform on which the wheel of the bus is mounted in order to register the pressure required to cause the brake drum to turn in the band. A lever is used to build up pressure for equalization adjustment purposes.

Association News & Discussions

New York Electric Railway Men Meet

Annual Midwinter Session Well Attended—Papers Covered Wide Range of Operations, Specializing on Accident Prevention and Maintenance—L. S. Storrs Reviewed European Trip

ON JAN. 25 the members and delegates of the New York Electric Railway Association gathered at the Commodore Hotel in New York for the annual midwinter meeting. The morning and afternoon sessions were crowded with talks and discussions by New York operators as well as invited speakers from neighboring states.

The annual dinner was held in the evening, at which the Hon. A. Harry Moore, Governor of New Jersey, gave an address, followed by the "constructive humorist" Dr. W. Warren Giles.

At the morning session Lucius S. Storrs spoke extemporaneously and gave many interesting comments on his recent trip through Europe.

"Unbounded enthusiasm," said Mr. Storrs, "never existed in Europe in making extensions into undeveloped territories and in providing service to small communities as it has in America." Had it not been for such extension and overdevelopment in the early days of American electric railway development the industry today, in all probability, would not be in the condition that it is. It is general all through Europe that there is five times the population per mile of track that there is in the United States. Even with the further advantage of not having the number of private automobiles with which to contend and compete, European operators find their situation in many respects as acute as it is in America today.

Many of the same problems that are being solved in the United States today are being solved in Europe in a somewhat similar manner. The service in the big cities is being unified, or coordinated, and where competitive services have been unified it has generally been found that the patronage of the combined service was greater than that of the sum of the competitive systems. This unification work is being accomplished in London and Berlin particularly.

Mr. Storrs made the statement that European street cars are noticeably quieter than those in the states. This is due jointly to better maintenance of both track and rolling stock with the objective of noise reduction, as well as in the design of the cars.

"Along the lines of new design there have been many interesting developments in London, Berlin and Nuremberg," said Mr. Storrs, "and many of these designs have recently been brought to your attention through the good agency of the JOURNAL." There is somewhat of a general tendency to get away from double-truck cars and to build long car bodies mounted on four wheels. New designers in London are for the first time beginning to use air brakes, but generally on the Continent electric braking is the rule.

New Paris cars are very free from cumbersome equipment mounted underneath the bodies. Two small high-speed motors below the floor are connected to the driving axles through a system of bevel gears which are completely submerged and running in oil.

Mr. Storrs read a brief comment from the manager of a large European system wherein the manager spoke of his visits to the United States and the reports of many other European visitors, saying in effect that "the time will come when Europe will be modern and the United States will become old fashioned. The world used to look to the United States for progress and new developments, but not so today." While Mr. Storrs disclaimed a belief in this, it was natural that it was food for much thought and an observation that cannot be overlooked by American transportation men.

H. K. Bennett, safety manager United Electric Railways, Providence, R. I., delivered an inspiring talk on the value of safety work by utility companies as well as by all organizations. The monetary value of life and limb is of no consequence compared to the real value to the individual and his associates.

COMING MEETINGS OF

Electric Railway and Allied Associations

Feb. 2—Central Electric Railway Master Mechanics' Association, Toledo, Ohio.

Feb. 3—New England Street Railway Club, meeting, Copley Plaza Hotel, Boston, Mass.

Feb. 3-4—Central Electric Railway Association, winter meeting, Toledo, O., Commodore Perry Hotel.

Feb. 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

Feb. 7-10—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

Oct. 3-7—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.

On Nov. 15 last year, through the agency of the radio, Mr. Bennett established an "Uncle Red's A.B.C. Club" for the promotion of safety, the A.B.C. being the initials of the club's watchword, "Always Be Careful." Announcement was made that the first eight whose names were received would be the officers of the club. The morning after the announcement 500 letters awaited opening. By Jan. 1 there were 900 names of children from 9 to 15 years of age enrolled, and on Jan. 24, due to a membership drive for which some 27 prizes amounting to $500 were distributed, the enrollment became 16,950 children. As Mr. Bennett said: "There are nearly 17,000 children who have promised not to roller skate in the streets, not to use their scooters on the highways and to follow other similar rules of highway safety."

A. L. Hodges, assistant to the vice-president and general manager Brooklyn City Railroad, discussed the safety bonus plan. Mr. Hodges explained that this plan consisted of allowing each motorman and conductor $5 for each 30 days that he worked on full time with no "at fault" accidents to his credit. Even a faultless accident that was unreported caused the trainman to lose the bonus for that month. Both the motorman and conductor are held jointly responsible for "at fault" accidents and likewise receive separate bonuses. The result for the first few months of this system are told in Mr. Hodges' analysis, which appears on page 215.

Dr. C. P. Segard, assistant secretary of the Third Avenue Railway, New York City, took an opposing view of the bonus plan, as explained in his paper abstracted on page 216.

In discussing the safety problem, A. D. Brown, claim agent for the New York State Railways, Syracuse, N. Y., said that the particular system employed, whether with or without a bonus system, was not of so much importance as the interest and energy that was displayed by the employees in promoting safety.

R. R. Hadsell, general superintendent of transportation New York State Railways, Rochester Lines, stated that the award system was in effect on that property. This plan has worked well and has created considerable interest in the subject of safety. Awards should not be monetary and the interest of trainmen can be aroused by talks from the executives in which the cost of accidents are thoroughly analyzed.

Samuel Porcher, assistant to the vice-president Pennsylvania Railroad, developed at some length the purchasing and stores system as now used by that company. Some 14,000 articles in amounts totaling about $50,000,000 represent the normal stock carried by the railroad. The purchases to maintain this inventory are about $150,000,000 a year, or three times the normal value of stock on hand.

There is no centralized storeroom, but there is a centralized store control. The stores accounting system is based on actual inventories, which are kept up to date monthly. On the entire system there are 21 ordering and distributing storekeepers, with supplies under their jurisdiction kept in 400 to 500 locations. The entire department is under a stores manager and is divided into two main parts, under two general storekeepers, one of whom, located in Philadelphia, has charge of the requisitioning of material that must be purchased from outside sources, while the second, located at Altoona, has supervision over that element of the stores manufactured in the company's shops.

It is interesting to note the source of the maintenance and operating materials that are handled by the stores department. Sixty-six per cent comes from manufacturers direct, 12 per cent in value are materials that are essentially manufactured in the company's shops and 22 per cent are recovered or reclaimed from old or obsolete equipment which otherwise might be largely scrapped or wasted.

Operating under the stores manager are ten supervisors who are the eyes and the ears of the department. These supervisors have no definite office or any office force, but are continually traveling over the road observing the use or possible waste of materials and to see that the stores control is carried out as planned. Certain of these supervisors are specialists, one on scrap, one on supplies, one on storing and binning, and another specializes on "frozen" items of material.

Due to the reorganization of this department several years ago, the inventory for the property has been materially lessened, from $87,500,000 to $64,000,000, and in 1925 to $50,000,000, due to the close adherence to minimum quantities in stock and by the close attention given to stores service.

Recent improvement in car design was the subject of a paper presented by W. C. Bolt, superintendent rolling stock and shops Eastern Massachusetts Street Railway. In the opinion of Mr. Bolt the electric railway industry is not up to date in the matter of car design. At least it has been slow in bringing out new models. While much valuable work has been done by the committee on unification of car design and the committee on equipment, he said that he thought another committee could do some worth-while work for the industry by studying European as well as American design. Germany and France have made radical changes in car design recently, while in this country there has been developed a car of less weight but very much resembling the car of 20 to 30 years ago. This, Mr. Bolt thought, is not sufficient to keep abreast of the times. Continuing, he gave an outline of the developments in car design on the Eastern Massachusetts Street Railway system. An abstract of his paper appears on page 207.

Mechanical improvements to reduce maintenance costs were discribed by W. L. Welter, Public Service Railway, Newark, N. J. More than 5,000 motor frames were revamped by electric welding. Smaller bearings were installed and oilers added. This resulted in a reduction of about 50 per cent in bearing costs in 1926 as compared with 1920. He mentioned also the method followed by Public Service Railway of changing the operating end of single-end cars when they were rebuilt for one-man operation, thus placing the large platform at the front. Pneumatic door engines and electric fare boxes and registers were installed. At present the company is experimenting with refitted semi-de luxe cars.

Accounts, auditing and organization were discussed by H. D. Chamberlain, auditor Delaware & Hudson Company, Albany. He said that the balance sheet as a whole is inexorable. It will eventually reveal the truth, and any attempt to make it show results not in accordance with the facts will result in only temporary advantages to those indulging in such practice, with compensating disadvantages later to them or to their successors.

The auditor cannot successfully keep accounts without a knowledge of the practical and technical phases of the operations of his company. Neither can an operating officer successfully handle the affairs of any important department without a more or less complete knowledge of accounting. This would seem to obligate both the accounting officer and the operating officer to a certain degree of broadmindedness.

The afternoon session ended with a moving picture film showing the manufacture of steel wheels and axles. This was accompanied by a talk by George A. Richardson, manager technical publicity department, Bethlehem Steel Company.

Accident Prevention Bonus —A Means to an End*

By A. L. Hodges

Assistant to Vice-President and General Manager Brooklyn City Railway

Offering of a bonus to conductors and motormen who operate their cars over a given period without an "at fault" accident is not new. We had the privilege of studying such plans as were in effect on other properties before adopting our "Accident Prevention Bonus" on Aug. 1, 1926.

During the fiscal year ended June 30, 1925, our company paid out $679,283 in accident damage claims. During the fiscal year ended June 30, 1926, we paid out $810,186, an increase of almost $131,000 in a twelve-month period. The 1925 figure represents 5.8 per cent of our operating revenue and the 1926 figure 6.95 per cent. These figures include the cost of our legal and claims departments, which will average $20,000 per month.

Various sorts of "no accident" contests were held as between depots, with talks by representatives of the management; charts were prepared showing just what the men on each line out of each depot were doing, but in spite of all this work our claim costs increased.

As a result it was decided to establish our accident prevention bonus plan, which became effective Aug. 1, 1926. An individual copy of this plan was put in the hands of every operator.

We feel that the results thus far obtained have been most gratifying. The first payments under this plan were made on Dec. 15, 1926, representing four months of operation under the bonus system. At that time we distributed $20,770, more than half of this amount, or $11,205, going to 747 men, in $15 denominations. Ten dollar checks were distributed to 727 men and $5 checks to 383 men. Also nineteen men (four conductors and fifteen motormen) received $20 checks. This meant that this last-named group worked 120 days out of a possible 122 days without an "at fault" accident.

On Dec. 15 we had 2,172 conductors and motormen in service and 1,876, or 86.4 per cent, participated in this award. It is perfectly obvious, therefore, that while we might have, and did have, some skeptics among the conductors and motormen when this plan was first proposed, we now have at least 1,876 men who are thoroughly sold on the idea and are plugging every minute to see how many times they can get on the bonus list for 1927.

For the last five months of 1926 (August, September, October, November and December) we had 5,433 accidents of all classes. For the same period in 1925 we had 6,006 accidents of all classes, a decrease of 573 accidents. Some 3,439 of these accidents, or 57.2 per cent were car and vehicle collisions. Of the total of 5,433 accidents occurring during the last five months of 1926 we considered our conductors and motormen were at fault for 2,229, or 41 per cent. In other words, 49 per cent of our accidents are caused by the carelessness, selfishness or ignorance of the other fellow, and the most popular indoor sport in this great city is to try and get the railway companies to pay out their hard-earned nickles in this class of accident.

During the month of August our men were at fault for 45.5 per cent of the accidents. This percentage of "at fault" or "preventable" accidents has shown a steady decrease and for December was 38.3 per cent, the average for the five months being 41 per cent.

I know you are all thinking about the probable or possible increase in "blind" or unreported cases. That is a bugbear set up by most claims men whenever accident bonus is mentioned. Our experience during the last five months of 1926 in this connection has been most gratifying. During this period we received 128 blind accidents and for the same period in 1925 we received 194, a decrease of 33 per cent. This certainly should dispel any antagonism to an accident prevention bonus from the no-report viewpoint.

It is very difficult, on account of prolonged litigation in most claims work, to give the definite monetary savings, especially when the plan has been effective for so short a time. However, our claims payments for the first half of the fiscal year ended Dec. 31, 1926, were $349,567, which is 6.1 per cent of the operating revenue. If this same rate is continued, and we firmly believe that it will be, we will have an expenditure of $700,000 for the fiscal year, which will be $110,000 under 1926.

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*Abstract of paper presented at New York Electric Railway Association, New York, N. Y., Jan. 25, 1927.

As a further argument along this line let me point out that our 1925 payments on 1925 accidents amounted to $260,945, while our 1926 payments on 1926 accidents were $231,571, a decrease in current payments of $29,373.

Accident Prevention Work on Third Avenue System*

By Dr. C. P. Segard
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THE approach to accident prevention and safety has changed because the factors involved have changed. Traffic accidents were few when the horse-drawn vehicle was in vogue. Our accidents were mostly in the shops, where machinery was not well designed nor well guarded. To-day the situation is reversed in two ways. Industry has cut accidents down to a small fraction of what they were and traffic accidents now head the list. Individuals were also personally responsible in the days of unguarded machinery and slow traffic, with automobiles averaging 5 to 8 miles an hour. But when the speed doubled and machinery became, to all intents, foolproof personal responsibility and contributory negligence stopped breathing and turned cold.

Special training should be instigated so that in emergencies the right thing is done by force of habit. If the motorists who are involved in the majority of traffic accidents had the habit training in starting, stopping, cautionary and emergency operation that is given to platform men accidents would decrease.

Two groups of accidents that are of personal interest are the passenger and pedestrian group. In my opinion the trolley is the safest mode of transportation on the street to-day. The passenger and pedestrian group live in their homes under more hazardous conditions than any public would stand for. Many conditions of poor stairs, hazardous gas and electric equipment and broken stepladders in the home would not be tolerated by any street railway.

Coming now to a question of bonus as a means of accident prevention, as a first consideration it is part of the job of all of us to give safe service. Congestion of population, great increase in autos, traffic regulations, passengers per car-mile, private right-of-way and speed of general traffic are all factors that affect the accident ratio. They are all variable factors in that they affect one run and do not affect another. Neither can their efficacy be valued. For these reasons I believe that a bonus plan is but a temporary expedient that will cause new problems. Human weakness is such that every party involved lays the blame on the other. Your human classification of "who is to blame" can cause only dissatisfaction. Severity of the accident prevented cannot be measured. In view of all of these factors I am at a loss to understand how a bonus system can be equitable. In addition there is always the knowledge that the fellow who does nothing never has an accident. In other words, you can eliminate every accident by increasing the cost of transportation, decreasing your speed and slowing of traffic.

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*Abstract of paper presented at New York Electric Railway Association, New York, N. Y., Jan. 25, 1927.

New England Street Railway Club to Hold February Meeting

NEW ENGLAND STREET RAILWAY CLUB will hold a meeting on Feb. 3 at the Copley Plaza Hotel, Boston, Mass. The afternoon session will be called at 3 p.m., at which session, "Buses—Mechanical Drive and Electric Drive" will be the subject for discussion by speakers: Charles Froesch, engineer Mack Motor Truck Company; R. E. Fielder, sales engineer Yellow Truck & Coach Manufacturing Company; and J. C. Thirlwall, engineer General Electric Company. At 5:30 there will be an executive committee meeting. And in the evening Hon. Ralph S. Bauer, Mayor of Lynn, Mass., will address the meeting.

The secretary requests that reservations for the dinner, $2.50 per plate, be mailed immediately.

Equipment Men for Southern Properties Meet in Memphis

PLENTY of action pervaded the eleventh semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, at the three-day session in Memphis, Tenn., Jan. 26-29. More than 100 delegates were in attendance.

In his opening address Mayor Rowlett Paine emphasized the splendid co-operative spirit that exists between the Memphis Street Railway and the city of Memphis. A. D. McWhorter, president of the association and general superintendent of the company, visualized the magnitude of the railway industry for the members present by reviewing the subject in actual figures. He stated that the industry represented an investment of more than $5,000,000,000, with 300,000 people in its employ and an annual payroll of $300,000,000. In 1926 the industry transported more than 16,000,000,000 passengers. He also pointed out that 484 companies were operating 20,701 one-man cars. He supplemented this statement with a declaration of the fact that he believed the motor vehicle would be a co-operative factor rather than a competitive.

The subject "Modernization of Cars and Better Maintenance Practices" was discussed by E. W. Ford, vice-president of the Memphis Street Railway. Other subjects discussed were: "Modern Railway Control," by C. J. Axtell, special railway engineer General Electric Company; "Treadle Operation," by R. S. Frehse of the National Pneumatic Company; "Experience with Safety Cars," by T. R. Bristol, assistant superintendent of equipment of the Georgia Railway & Power Company; "Importance and Methods of Instructing Safety Car Operators," by E. R. Ray, employment agent of Memphis Street Railway; "Essential Features of Modern Street Cars," by E. A. Palmer, special railway engineer Westinghouse Electric & Manufacturing Company; and "Co-operation," by J. L. Brown, master mechanic of the Dallas Railway.

Delegates were taken on an inspection tour to the Memphis Street Railway's shops, carhouses, service building and power house. Among the entertainment features was a banquet and ball on Thursday evening in the Louis XVI ballroom of the Hotel Peabody, the headquarters of the association.

American Association News

Association Collecting Data on Insurance

QUESTIONNAIRES calling for data on their insurance experience in 1926 have been mailed out from association headquarters to all electric railway companies. This is on behalf of the committee on insurance, which, under the chairmanship of Paul E. Wilson, vice-president Cleveland Railway, is charged with the task of gathering accurate insurance data from the whole electric railway industry as a basis for its study of the insurance problem with a view to improving the industry's position in respect to insurance.

It is of vital importance to the success of the committee's work that it receive answers to its questionnaire from every electric railway in the country.

Every company, therefore, without exception, whether a member of the association or not, is urged to give careful study to the committee's questionnaire and to return it promptly to headquarters, filled out with the data requested.

Transportation Man and His Job

ON FRIDAY, Feb. 4, a meeting of the Metropolitan Section, American Electric Railway Association, will be held at 8 p.m. at the Engineering Societies Building, New York City. "The transportation man and his job" will be the general subject of discussion. G. T. Geer, secretary Third Avenue Railway, New York City, and Major J. S. S. Richardson, Pennsylvania Public Utility Information Bureau, will treat of various phases of this subject. Isabel Dazie, secretary woman's committee, Public Relations Section, N.E.L.A., will talk on "woman's place in the public utility field." Before the meeting the usual Dutch treat dinner will be held at Friedlander's restaurant.

The News of the Industry

Now They Know What They Miss

Residents in the communities and various suburban towns along the route of the Grand Rapids, Holland & Chicago Railroad, which discontinued service, sold its equipment, buildings and right-of-way several weeks ago, are bending every effort to have railway transportation restored to their communities.

Since the interurban company ceased operations factory workers, office clerks and women shoppers have permitted themselves to be packed into buses, after long waits, for the ride into the city or home. Four buses were placed in service at first by the bus company that is presuming to cover the territory, but it now has twelve in operation, and a Chicago Shore line bus company had added a commuter service. Still the service is inadequate to care for the demand of the residents along the route.

Seeing no relief in transportation, weary of the inconveniences and the irregularities, these residents are now attempting to form a company, lease the cars, right-of-way and purchase power from the Consumers Power Company, which bought the right-of-way for its power lines, and attempt to restore the old order of things.

The interurban suspended because of lack of patronage. Since service was withdrawn property values in the several villages, towns and suburban districts have slumped and new homes in process of building are being left unfinished pending the outcome of the efforts to re-establish the line. Lumber firms are instituting legal action against home and property owners for materials, hoping to collect before property values decline and jeopardize their liens. Factory workers from these districts who used their autos in preference to the interurban service now find parking restrictions in the city more closely drawn.

So, grasping at any plan that would partly restore the old-time interurban service, reduce accidents and permit wives of workers in the villages to go to Grand Rapids to shop and attend to other necessary duties, the much-agitated residents are seeking to effect organization of all suburban communities interested in resumption of interurban railway service between Grand Rapids and Jenison, a distance of about 8 miles, and serving a population of about 30,000.

H. T. Slaght, president of the Grandville State Bank, has been elected general chairman of the organization for the sale of stock in the United Suburban Railway, the name of the proposed company. Villagers, farmers and all who will pledge their support are being solicited. Subscriptions from $10 to $1,000 and over are being solicited. The keynote of the soliciting committee's plea is loyalty to the new company backed by patronage—if the wheels ever get turning.

A mass meeting was held on Jan. 21 in Wyoming park and solicitors were instructed by Mr. Slaght in anticipation of starting work the next morning. Committees are being formed in Galewood, Beverly, Homewood, Burlingame, Ivanrest and other communities. Every resident will be asked to subscribe.

Meanwhile the wrecking company from Chicago and H. Braudy & Sons, Grand Rapids, have completed the work of tearing up the track between Zeeland and Holland. The right-of-way between Saugatuck and Holland already has been cleared.

Manufacturing and other interests in Saugatuck made an effort to finance the purchase of rails, with the idea in mind of establishing a gasoline engine service between that town and Holland, but the move failed.

Chicago Extension Approved

Mayor Signs Ordinance Providing for a Day-to-Day Agreement for a Six Months Period—Public Referendum Suggested for Disputed Points in Proposed Transit Ordinance

CONTINUED operation of Chicago Surface Lines under a day-to-day franchise extension was assured on Jan. 27 by the Mayor signing an ordinance passed the day before by the City Council and approved by the federal court and the receivers of the Chicago Railways. The grant carries a six months limit cancelable at the city's option. The court relieved the city's anxiety by authorizing the receivers to continue payment of the percentage of net earnings stipulated under the terms of the grant under which the companies have been operating. The receivers of the Chicago Railways Company were also authorized to pay the interest on the first mortgage bonds and to utilize the present Surface Lines operating board.

Consideration of the consolidated surface and elevated lines ordinance framed some weeks ago by city and company attorneys was resumed on Jan. 21 by the local transportation committee of the Chicago City Council after several days inquiry into the independent proposal for the merging of all local transportation agencies into a $1,000,000,000 corporation recently laid before the committee by Henry A. Blair, president of the Chicago Surface Lines. Criticism of many of its important financial features caused the latter plan to be temporarily dropped from the program of discussion.

The new elevated-surface lines unification ordinance now in tentative form proposes the granting to a single company the right to operate surface, elevated, subway and bus lines under an indeterminate permit. New state legislation would be necessary before the city could grant such an ordinance or before the surface and elevated lines could consolidate. The present legal limit on street railway franchises in Illinois is 20 years.

The feeling exists in the local transportation committee, however, that little would be gained by seeking enabling legislation until the companies can come to a definite agreement on consolidation terms, reasonable valuation of all properties involved and a satisfactory rate of return. So long as these vital points remain unsettled, it is pointed out, no solution of the traction problem can be effected.

In event of a complete deadlock over these questions, Alderman Joseph B. McDonough, chairman of the committee, let it be known that he would submit all disputed points in the ordinance to the citizens' traction committee, which was appointed by the City Council last month to help bring about a settlement.

The question was raised by Corporation Counsel Francis X. Busch as to whether the city would have financial and legal authority to terminate the permit without long and involved litigation in case the company was not living up to the terms of its contract. He offered no opinion in this matter, but insisted that legislation creating the terminable permit would have to be coupled with adequate provision for local regulation. Mr. Busch also urged that all ordinances now pending before the committee be submitted to a referendum so that the voters would be afforded an opportunity to determine which of the several plans they preferred. Whichever plan received a majority of all votes cast, he said, would then be adopted.

Protests by Cyrus H. Adams, attorney for the Chicago Rapid Transit Company, to a clause in the terminable permit ordinance which provides that the new company taking over all transportation agencies should bear the expense of removing tracks and structures thought unnecessary evoked a lengthy discussion of that feature of the measure. Mr. Adams contended that the provision might be expensive to his company because the removal of the entire Loop elevated structure may be ordered. The obsolete trackage of the surface lines that would come under the order would be negligible in comparison, he declared. The committee finally overruled the objections, however, by voting to retain that feature in the tentative ordinance. Leonard A. Busby, president of the Chicago City Railway, and Weymouth Kirkland, attorney for the Chicago Railways receivers, agreed to accept the feature without disputing it.

The decision to require the company which receives the new ordinance to make surface lines extensions of 30 miles of single track each year for the first five years was one of the few points in which the committee was in complete accord. No recommendations were made as to elevated line extensions as attorneys for the rapid transit company have not indicated how much the company would be willing to undertake in this period.

At another meeting on Jan. 25, the subject of a suitable contract between the city and the company with regard to building and operating a subway was exhaustively studied. The committee hopes to complete its study of the ordinance in about ten days or two weeks.

Local exponents of municipal ownership for public utilities, recently organized as the "Detroit Plan Traction Ownership Club," are accusing Mayor William E. Dever, once a strong advocate of city ownership of the street car lines, of desertion from his former pledge and of seeking to avoid a public declaration of his attitude toward the present traction franchise negotiations.

Under the leadership of Henry M. Ashton, a local attorney, members of the club have announced their intention of fighting the plan to grant a new franchise to the Surface Lines. They demand that the city purchase the properties, as was done in Detroit when that municipality took over the street car lines at the end of their franchise period.

Seattle in Throes of Suit

Theater Owner Demands City Must Pay Municipal Railway Employees—Judge Hall Sums Up Railway Tangle—"A $5,000,000 Utility Is Not Worthless," He Claims

SUIT to compel the city of Seattle, Wash., to pay in cash employees of the Seattle Municipal Railway and all other expenses of operating the railway and to enjoin the city from paying to Stone & Webster any further money on the purchase contract for the line until all labor and operating claims are paid has been filed in the Superior Court by John G. Von Herberg, Seattle theater owner. The court issued a temporary order restraining the city from paying any further money on the purchase price of the street railway until labor and operating claims have been paid. The suit came as a complete surprise to city officials and there are varied opinions as to who is back of the move.

In his complaint Mr. Von Herberg asks the court not only to construe the contract of sale as requiring labor and operating expenses to be paid out of the street railway earnings ahead of any further payments due Stone & Webster but also asks that the city be prevented from using funds from any other municipal utility for the relief of the street railway, for operating, maintenance, purchase, replacement or for any other purpose. The court also is asked to direct the city to pay into the street railway operating fund all of the gross revenues of the line.

The suit attacks the City Council's position that bond redemption and interest payments of the street railway lines must be paid out of the street railway funds before the salaries of the employees. It came on the eve of the third consecutive "payday" in which street car men were paid in warrants, while the earnings of the line are diverted into the bond redemption and interest fund. Mr. Von Herberg on the Dec. 24 pay day took care of the employees' warrants and announced himself ready to cash the Jan. 10 warrants, but the employees found no difficulty in cashing their checks throughout the city.

On Feb. 1 the Seattle Municipal Railway must have $1,151,845 to send to New York for March 1 bond redemption and interest, and to provide this sum all earnings of the lines have been diverted into the bond redemption fund and the payroll and material charges have been placed on warrant. Unless enjoined by the court, this sum will be forwarded before March 1. In his complaint Mr. Von Herberg sets forth that no payroll of the Municipal Street Railway can be met in cash for a period of at least five months. It charges that the city is accumulating all the revenues of the railway and keeping them on hand to meet the payment due in March; that the city unlawfully transferred, on Dec. 21 last, $135,000 from the light and water fund to the railway fund, and that it has since dipped into the water fund and wrongfully transferred $10,000 from the water to the railway.

FORMER OWNERS WANT TO INTERVENE

Concluding an all-day hearing on the Von Herberg suit, Judge Calvin S. Hall of the Superior Court continued the case until Jan. 25. Previous to the hearing, and coincident with an attack by the city on the Von Herberg suit, the Puget Sound Power & Light Company, representing Stone & Webster interests, who sold the railway to the city in 1919, filed an action in the federal court in which it names both the city and Mr. Von Herberg as defendants, asking that they be restrained from withholding payment of the bond redemption and interest on the railway purchase contract until operating expenses of the line have been paid. In the city's return on the show cause order in the Von Herberg suit it asks that the plaintiff make the Puget Sound company a party to the suit, and in the federal court the Puget Sound company asks that Mr. Von Herberg be restrained from making the company a party to his action against the city.

The company, in its petition, asks for a temporary order restraining the city from using any portion of the gross earnings of the Municipal Street Railway to pay operating expenses or any other inferior claims until after the annual installment on bonds and interest due March 1 has been paid. The Puget Sound company recites the terms of the purchase contract and asks that Mr. Von Herberg be bound by the decree in the Frank Twichell case, in which the validity of the purchase ordinance and the bonds was upheld. In its complaint the company calls attention to the fact that in the purchase contract the city obligates itself to pay bond redemption and interest out of the gross earnings of the railway, even though the amount remaining should be insufficient to pay the operating costs of the line. It cites that since the city took over the lines the gross earnings have amounted to more than $25,000,000, a large part of which has been devoted to the payment of operating expenses. It contends that the legality of the ordinance and the bonds has been upheld in court, and charges that the Von Herberg action against the city is an effort to cause the city to default on its bond and interest payments, thereby doing irreparable injury to the holders of the bonds. The motion asks that the city be required to perform its part of the contract and to pay daily into the special bond and interest fund the entire gross earnings of the railways so the payments due March 1 will be on hand in the fund Feb. 1 as the contract requires.

The city, in its return to the Superior Court on the order to show cause why a temporary injunction should not be issued restraining the railway from putting any more money in the bond fund until the payroll has been met, filed a motion asking that the plaintiff, Von Herberg, bring into the action the Puget Sound Power & Light Company, so that any decision that may be made will be binding on the company as well as the city. The city also asserts that two causes of action have been improperly joined, a mandamus and an injunction action.

Judge Calvin S. Hall, commented at length on the railway situation, saying among other things:

> That the street car employees must be paid, and, that so far as he is able to do so, he will see that they are paid.
>
> That the corporate authorities have operated the railway efficiently and have accomplished what seemed impossible.
>
> That the railway is solvent.
>
> That he does not believe the City Council will make illegal transfer of funds.
>
> That the city owns the utility and that the power company has only a lien on the earnings and could not take it back.
>
> That the taxpayers have paid nothing, own nothing and never will pay anything on the railway—only the people who ride will pay.
>
> That the purchase contract is impossible of performance because the payments are too large.
>
> That the annual payments on the purchase bonds should be reduced from $833,000 to $400,000 a year.

Judge Hall declares that if it was apparent on Jan. 25 that the employees would not receive their pay, he would announce a decision, and continued in effect the temporary restraining order preventing the city from removing bond payment money out of the jurisdiction of the court.

Mayor Bertha K. Landes appeared before the Judge with the statement that she believed that the men would receive their pay on Jan. 25, the next railway payday. Judge Hall declared that if he could be assured that the men will get their money, he would not grant the restraining order.

After hearing the attorneys for both sides, Judge Hall made a statement in which he praised the accomplishments of Superintendent D. W. Henderson, Superintendent of Utilities Clark R. Jackson and the Council. He then continued thus:

> And I want to say that, in my opinion, if it ever comes to the Supreme Court, it will be held that due regard was not given for the payment of the cost of operation and the cost of maintenance in fixing this fixed amount of $833,000 annually, with interest. Neither the traction company nor the Council could have exercised its honest judgment and said that it would be able to pay that, because it amounted to 10 per cent upon $15,000,000.
>
> It has come to a point now where I believe the contract is impossible of performance, because the payments are too large to be made. The bondholders should recognize that fact, because if a receiver was appointed for the operation of the railway company, it would not mean that we would lose the railway. It would mean, in my opinion, that the cost of operation and maintenance would first be paid and then the bondholders would get what was left.
>
> The fair thing to do, in my opinion, would be for the traction company to acknowledge the fact that they exacted too much from the first; and instead of paying the balance of ten million dollars in twelve installments, that they make that twenty-five installments of $400,000 a year. Then the street car company would be solvent. The fund would be solvent then. Whatever additional amounts the utility could pay should be paid, but just bind the earnings to $400,000.
>
> I do not want to handicap the railway, and it is about time that the citizens of Seattle were not handicapping it, but should give full credit to those who are trying to work it out of the condition that it is in, and not by vexatious suits keep it in the minds of the public as being a utility that is worthless and discredited and thrown away, for it is not, as long as we have it and have paid $5,000,000 for it.

The city demurred to the Von Herberg application on the grounds that the court did not have jurisdiction in the case and that the bill of complaint did not constitute sufficient cause for action, but Judge Hall overruled the demurrer and the hearing proceeded on the application for the injunction.

Lord Ashfield for Complete Co-ordination Study

Lord Ashfield, first Baron of Southwell and chairman of the board of the Underground Electric Railways, London, has been making a visit in this country during the past few weeks. During this time he visited New York, Detroit, Washington, and other American cities. He returned to London Jan. 29. While in Detroit in discussing that city's transportation situation he said in part:

> Detroit, as well as other cities, should avoid the notion that the building of subways or the mere improvement of one branch of the system will meet any transportation difficulties it may have. These things should be done, of course, but they should be done with a view to co-ordinating all branches of the system.
>
> Buses will inevitably play an important part in the development of Detroit's transport system, but the street cars must be retained. The two should be operated as one system, even running on the same streets. Buses must be used in increasing numbers.

In speaking about subways, Lord Ashfield said:

> The work of constructing underground streets, for that is really what they are, should be started. And the subways should become part of the general transport system. At the outset, trolley cars in three or four car trains might be used to advantage on the underground streets.
>
> Subway construction is costly, but the results justify the outlay, just in the time saved the daily wayfarer. Time taken in traveling to and from work is time wasted, of no use to any one. Underlying discontent with transportation systems is, in most cases, slow service.
>
> The average speed of trolley cars and buses is 9 m.p.h.; subway trains—and I am not speaking of express trains—average 18 m.p.h. There is a time saving of 50 per cent. And, after all, time is money. I know of no city that needs an up-to-date transportation system more than Detroit, with its many factories in the outlying districts.
>
> The next step should be the drafting of plans of development of a co-ordinated system for the next ten years. And in exact proportion to the additional facilities provided, traffic will grow. We sometimes speak of "point of saturation," but I have never encountered this in the transportation business.

$175,000 for Another Milwaukee Cut-Off

Plans are under way by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., providing for the construction of a third cut-off electric line with a view to improving the interurban service now provided from Milwaukee to Hales Corners, Muskego Center, Big Bend, Mukwonago and East Troy on the East Troy division and from Milwaukee to St. Martins, Wind Lake, Waterford, Rochester and Burlington on the Burlington division. Faster time will also be made to Lake Geneva, Elkhorn, Delavan and Beloit, from which cities patrons are carried to the East Troy-Burlington electric line by the company's bus feeder line.

According to the application, which is now before the commission for approval, the proposed cut-off, which will be about a mile in length, is to be built from the West Junction station of the Milwaukee - Waukesha - Watertown rapid transit line south to the Fruitland station on the Burlington-East Troy line. This project will cost approximately $175,000 and will mean a 20-minute reduction in the running time of electric trains to Burlington, East Troy and intermediate points. This saving in operating time will be achieved by running the Burlington-East Troy trains over the more direct rapid transit route instead of the present slow roundabout way through the south side district of Milwaukee and the city of West Allis. The new line is also expected to effect substantial operating economies.

The cut-off will tap a large area now without any form of public transportation. It will be built over a private right-of-way acquired by the company. Three bridges will be constructed, one over the company's West Allis-West Junction electric line tracks and the others over the Sparta and Madison divisions of the North Western Railroad, coupled with the elevation of tracks at one grade crossing and depressing of tracks at another crossing.

Construction work on the cut-off will be started immediately upon receipt of the commission's consent of the plan so that it may be completed and in operation by midsummer. It is just another evidence of the progressiveness of the company.

"Silent Watcher" Contest in Salt Lake City Rewards Employees

Thirty trainmen of the Utah Light & Traction Company, Salt Lake City, Utah, and their wives, together with several officials of the company, attended an informal dinner party on Wednesday evening, Jan. 12, at the Newhouse Hotel, Salt Lake City, as guests of *Kar Fax*, the public relations publication of the utility.

The company prides itself on the high type of its trainmen, and this belief was substantiated when *Kar Fax*, started its contest for the pre-Christmas shopping days. The "Silent Watcher," a young newspaper woman here, was selected to observe and report the good things she heard and saw in connection with trainmen's performance of their duties. Her familiarity with company rules, car routes and human characteristics in general was sufficient evidence of her competency to judge and report her observations.

A notice posted on the trainmen's bulletin board a day or so before the contest explained its purpose. The points were scored in this order:

1. Courtesy toward passengers.
2. Consideration for the aged and for children.
3. Efficient operation of cars—easy stops and starts.
4. Calling streets.
5. Neatness and cleanliness in appearance.
6. Neatness and cleanliness of cars.
7. Efforts made to make car riding safe, comfortable and pleasant.
8. Refraining from unnecesesary conversation.

All trainmen were eligible to compete. The trainmen were enthusiastic from the start and dubbed the "Silent Watcher" their "Guardian Angel." The reports received and results obtained were encouraging and satisfactory in every respect.

The task of selecting the winners was by no means an easy one. When it was completed written invitations were sent to the winning trainmen and their wives. Each lady, before she was seated at her table, received a rose. The public relations department representative was toastmaster. Short talks were made by some of the company officials, the "Silent Watcher" was introduced and made a few remarks, and Mayor C. C. Neslen, on behalf of the company, presented each trainman with a card of thanks and appreciation to which was attached a $5 gold piece.

St. Petersburg Bond Election Set for March 1

A referendum bond election is scheduled for March 1 in St. Petersburg, Fla. The purpose is to authorize the construction of a municipal belt line railway connecting the port of St. Petersburg with rail transportation. By unanimous vote of the five city commissioners present at the regular meeting of the board the election was passed on first reading. The issue of the municipal securities proposed will amount to $362,000. In taking action city officials pointed out that the industrial electric railway could be constructed for at least $30,000 less than the amount already voted and now remaining of the proceeds of the bond issue formerly authorized for the transit shed improvements.

New Franchise Draft in Kansas City

A tentative draft of the proposed 30-year franchise for the Kansas City Public Service Company, new owners of the railways system in Kansas City, Mo., has been drawn up by A. N. Gossett, chairman of the special committee of the City Council. The franchise embodies points already agreed upon by the committee and the Council. The franchise will be presented to the City Council and then considered at public hearings. Included among the proposals of the tentative franchise are:

A return of not more than $2,000,000 annually after the company has expended $3,300,000 in repairs in the next two or three years.

A sliding scale of fares based on an implied valuation of $25,000,000.

An additional expenditure of $3,300,000 in improvements and extensions.

Resumption of traffic through the Eighth Street tunnel into the central industrial district.

Construction of a concrete viaduct over Mill Creek Parkway near St. Luke's hospital.

A sliding scale for fare reductions based on the earnings of the company.

Increased frequency of the railway operation.

Maintenance of all present lines and extensions when needed.

Limitation of fare increases and decreases to one year.

Reduction of the city members of the company board of directors from five to two, one of whom will replace the city member of the board of control and will have authority to determine what constitutes improvements and repairs.

Inclusion in the new franchise of the obligations of the company to pave the streets between the car tracks, pay car licenses and viaduct rentals and assume other obligations of the Jost franchise.

The Council committee is composed of Mr. Gossett, H. L. McCune and Jasper Bell. John T. Barker, city counselor; E. F. Halstead, assistant city counselor, and Bennett C. Clark, general counsel for the Public Service Company, also will attend the sessions of the special franchise committee negotiating with the company in drafting a new railway franchise.

Commission Claims 8-Cent Fares in Buffalo Sufficient

Expert accountants in the employ of the New York Public Service Commission have submitted a report to the board saying that the International Railway has been earning an average of 8 per cent on the investment of its Buffalo, N. Y., property under the valuation as fixed by the commission. The commission in its answer filed in the United States District Court at Buffalo to the equity action brought by the International Railway, seeking to raise its fare in Buffalo from 8 to 10 cents, says the company has been operating at a profit under the present rate of fare. It also contends the present rate of fare is adequate and that if the company is losing money the commission is the proper authority to grant an increase, without taking the case into the federal court

The company in its equity action contends the 8-cent fare is not sufficient to pay operating expenses and that the rulings of the commission are confiscatory. It requests an injunction from the federal court restraining the commission and the cities in which it operates local and interurban lines from thwarting the efforts of the company to put higher tariffs into operation. The company's application for a 10-cent fare in Buffalo will be heard by the utilities board early in February.

Atlanta Wage Scale Renewed

The Georgia Railway & Power Company has just secured a wage contract for the coming year with its railway employees without any increase in the wage scale now in force. The new contract for 1927, which has just been signed by representatives of the company and of the local employees' union, has been under consideration for several weeks. The employees demanded a material increase. The company averred that under present circumstances it could not afford to pay more than the scale now in existence. A renewal of the present wage scale was finally agreed upon, with provision for negotiations in May looking to an increase in wages for railway operators. The continued scale in Atlanta runs from 49 to 54 cents an hour, with extra pay to one-man car operators.

Battle Won with Customer Is No Victory, Says Woman Writer

At least one woman has been found who has emancipated herself from the class of female fighters. She is Mary Loftus Hulsman, copy writer in the advertising department of the Philadelphia Company, Pittsburgh, Pa., who tells the employees of the Pittsburgh Railways "if you want to argue join a debating class at night, but don't practice on your passengers." That is only one of the many admonitions contained in a recently written booklet entitled "Employees' Service Code." The purpose back of her literary effort is to suggest new ways and to recall old ways of serving the public in the best way possible. In twelve pages, with illustrated paragraphs about some phase of electric railway operation, Miss Hulsman suggests to the conductors ways of winning over the ladies, dilates on the value of being good natured and stresses the value of knowing their city and avoiding accidents. Loyalty for the company and enthusiasm for the work, she believes, are assets without which success cannot be attained.

"Show Me the Way to Go Home"

On being informed that one of the most successful operators in the electric railway business was formerly a show man, the editor of the Ottawa *Electric Railway News* said:

"Even at the present moment the successful street railway operator is a show man, responding through the medium of speedy, direct and comfortable service to the almost universal demand of the human race: 'Show me the way to go home.'"

Man Failure Responsible for Tragedy at Superior

An investigation conducted by Chairman Gettle of the Wisconsin Railroad Commission into the one-man car accident at Superior, Wis., has disclosed that the accident was due only to error by the human element and was not attributable to the one-man type of car. In this case the operator of the car, crossing the railroad track without first walking out upon it ahead of his car, saw the approaching train and, instead of crashing forward through the lowered gates, attempted to back off the tracks, then started forward again, and the car was caught by the train as it was finally pushing on ahead. The car was equipped with the required safety exits.

In reply to the wave of opposition against the use of the one-man car, statewide in character since the accident, Mr. Gettle declared that in all other cities now served in part or whole by one-man cars the record of accidents is no worse than is that experienced under two-man operation. In many instances the accident record of the one-man car is better than during the time two-man cars operated on the same streets. It is not believed that the accident will in any way change the commission's stand to continue to permit the operation of the smaller cars on those lines where they appear to be the most economical without retarding service.

On the other hand it is said that several legislators are gathering information preparatory to presenting bills for passage by the present Legislature requiring every street car to be manned by a crew of two men. To this end eight members of the Assembly from Milwaukee plan to attack the one-man car issue from another angle. They propose to introduce a bill taking the power of utility regulation out of the hands of the commission and giving it to local authorities.

The Railroad Commission has scheduled a hearing early in February on the application of the Superior Council to have one-man cars entirely withdrawn.

Rockford Franchise Adopted

The City Council of Rockford, Ill., recently adopted a new twenty-year franchise for the Rockford Public Service Company, with many changes from the franchise granted the Rockford City Traction Company in 1925. Two dissenting votes were cast. The new franchise grants many provisions sought by Milton Ellis, president and general manager of the new company. The new franchise exempts the railway from paving between its rails by direct assessment after five streets have been paved while the company bears the cost of paving between those rails; it must pay $50 annually for each car or bus it operates, a tax of $4,000 under the present equipment; may use one-man cars; must clear snow on its right-of-way within 48 hours, clearing the road to within a few feet of the curb. Wherever lines are abandoned the company is to remove tracks and restore paving to its original condition.

Louisville's "Best Public Servant" to Be Named

A notice has been posted on the various bulletin boards around the property of the Louisville Railway, Louisville, Ky., in connection with the Anthony F. Connelly award for 1926. Employees are urged to secure the necessary nominating blanks from the foreman and send in to the award committee the names of those considered best suited for the designation "Best Public Servant."

The notice tells the employees that in December, 1925, the directors of the Louisville Railway announced that as they had been inspired by the general effort on the part of the employees toward increased safety and efficiency they felt that this effort should be tangibly recognized and at the same time set up as a permanent recognition of the outstanding record of service of Anthony F. Connelly. The Anthony F. Connelly award carries an annual cash prize of $75 and a medal known as the Connelly Award, to be given to the employee of the Louisville Railway who during the calendar year rendered in his individual capacity the most useful or efficient service to the public which it served. All employees except officers and department heads are eligible for the award. The award is based either upon a sustained record of excellent public service throughout the year or upon one or more individual instances of outstanding and unusual public service, whichever, in the opinion of the award committee, constitutes the greatest contribution to public service record of the company. The notice was signed by James P. Barnes, president.

Work on New Kansas City Viaduct to Start

The Kansas City Public Service Company, Kansas City, Mo., has just begun work on its plans for a new viaduct to be built over Mill Creek Parkway at 43d Street. The new viaduct will be of reinforced concrete. During the process of construction a temporary trestle just north of the old viaduct is being used.

In all probability the roadway will be closed during the months of April and May to allow construction on parts of the new viaduct, according to William G. Woolfolk, president of the company. The viaduct is used constantly, being a Westport freight spur.

News Notes

Good Record in 1926.—During 1926 the number of accidents, cars charged off for defects, overhead emergency troubles and the number of derailments decreased substantially on the lines of the Toronto Transportation Commission, Toronto, Canada, over the previous year. The number of accidents per million car-miles in 1926 was 326, against 338 in 1925, 420 in 1924, 460 in 1923 and 512 in 1922. The company claims that the constant decrease is due largely to the vigilance and efficiency on the part of the men, the new and reconstructed rolling stock and the elimination of wyes.

Chair Car Service Withdrawn. — Operation of limited chair cars has been withdrawn by the Chicago, South Bend & Northern Indiana Railway on its South Bend-Michigan City division.

Early Report on Zone System.—The Tacoma Railway & Power Company, Tacoma, Wash., is now operating its railway lines under the zone system, effective from Dec. 20 until March 1, under the schedule filed with the State Department of Public Works. T. F. Marsh, superintendent of transportation, reports that the first few days operation indicate that the 5-cent downtown fare will prove popular with close-in dwellers and will increase this class of riding. No great confusion or difficulty was encountered in distinguishing car riders who traveled to the outside, or 10-cent fare zone. All fares are now collected as the passengers leave the cars instead of, as heretofore, upon entering.

Leavenworth Submits New Grant.—The City Commission of Leavenworth, Kan., submitted on Jan. 17 to the Kansas City, Leavenworth & Western Railway the draft of a new franchise ordinance. The new grant would permit the company to operate over the streets of the city for twenty years.

News Sheet Reappears. — The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has resumed publication of the Augusta-Aiken *News Letter*. The sheet will be published occasionally and will be arranged by employees for circulation among the employees. The last issue of the paper came from the press in March, 1924.

Gives Gift to Parting Official.—Members of the Street Railway Employees' Union, No. 313, Rock Island, Ill., as an expression of regret at the departure of Thomas C. Roderick, manager of the Illinois lines of the Tri-City Railway, presented to him a handsome desk set at a recent farewell reception in the assembly rooms of the Rock Island carhouse. H. E. Wendell, president of the union, made the presentation. Mr. Roderick leaves Feb. 1 to become general manager of the Ottumwa Gas Company.

Hears Foes of Subway Pact.—The Pennsylvania Public Service Commission heard argument on Jan. 24 from opponents of the contract between the city of Philadelphia and the Philadelphia Rapid Transit Company to construct a two-track subway in Chestnut Street. Counsel for the company, the city and the underlying lines summed up the case by emphasizing the necessity for the improvement and defending the agreement. The objectors claimed that the application was unconstitutional because the city was lending money to a corporation and also that it was illegal in that it violated the act of 1917 limiting contracts between municipalities and utilities to 50 years. Councilman Roper and former Public Service Commissioner J. Henry Scattergood opposed the scheme. Other representatives of organizations opposing the lease included C. Oscar Beasley for the United Business Men's Association.

Foreign News

Electrification of French Railroads Progresses

Electrification of the Paris-Orleans railroad line is progressing steadily. Recently ten passenger trains were carried by electric power between Paris and Les Aubrais, a distance of 123 kilometers. Before the end of 1926, electric traffic will be complete as far as Vierzon, and the power for the route to this point will be supplied by the hydro-electric mill of Eguzon, representing a total installed power of 50,000 kw.

The electrification program of the Paris-Orléans line includes the Paris-Brives section of the Paris-Toulouse line and the two transversal lines, St. Sulpice-Gannat and Brives-Clermont.

Safety First the Aim in Keighley

Despite the alarming increase of fatal street accidents in the London area, accidents caused by trolley cars are on the decline and only four are recorded for the last quarter of the year ending with the month of September as compared with 29 on the bus. The Keighley Corporation Tramways is helping to reduce still more the mortality caused by vehicular traffic by distributing to all of its traffic employees, small leaflets—miniature reproductions of the safety first posters used by the National Safety First Association.

Proposed Tunnel Through Mont Blanc.—Much interest is being taken in Italy in a project for the construction of a tunnel through Mont Blanc in order to give better means of railway communication with Italy, France and western Europe. The tunnnel would be a little more than 9 miles in length, but although not so long as the Simplon tunnel, which is nearly 11 miles, its cost is expected to be much greater. The project would include the construction of an electric railroad.

New Railway Offices Approved.—The directors of the London Underground Railway companies have approved the design for new headquarters which will be erected on Broadway, Westminster, where the present offices are situated. The plan is in the form of a Latin cross, the center portion of which contains entrance halls, staircases, and lifts, while the four arms give the office accommodation. The north wing will form on the ground floor the new entrance to St. James Park Station and will connect with the existing offices. The building is estimated to cost £300,000. The maximum height will be 100 ft.

Trackless Trolley System Adopted by Chesterfield, England. — Chesterfield Town Council has recently announced a decision to change its entire system from tram cars to trolley buses and as a result has placed a contract for fourteen trolley buses to be put into operation as soon as the alteration of overhead equipment is completed.

Recent Bus Developments

New York Awards to Be Narrowed to Seven Bidders

The Board of Estimate of New York City on Jan. 27 adopted resolutions directing the Board of Transportation to prepare franchise contracts with seven bus petitioners. Originally there were 72 such applicants. They submitted 106 separate petitions. The adoption of the resolutions by the board was in ratification of an agreement reached at an executive session on Jan. 26.

The companies for which the Board of Transportation was directed to prepare franchise contracts are the Equitable Coach Company, for a franchise for Manhattan, Brooklyn and Queens; the Surface Transportation Corporation, a Third Avenue Railway subsidiary, for a franchise for the Bronx; the Manhattan Surface Coach Company, a subsidiary of the New York Railways, which is seeking a franchise for Manhattan; the Coney Island & Gravesend Bus Corporation, a subsidiary of the Brooklyn-Manhattan Transit Corporation, and the Brooklyn City Railroad, which asks a franchise for Brooklyn; the Rauchwerger Bus Company, which seeks a Queens franchise, and the Tompkins Bus Company and the Staten Island Coach Company, a subsidiary of the Richmond Light & Railroad Company, each of which is an applicant for a bus franchise for Richmond.

The Board of Estimate set March 22 as the date for a public hearing on these contracts. Presumably the board will award the actual franchises soon after this meeting. The first regularly scheduled meeting of the board at which this can be done will be on March 24.

Gary Subsidiary Buys Coach Company

Authority to purchase the equipment of the Calumet Motor Coach Company, Hammond, Ind., was granted on Jan. 15 by the Indiana Public Service Commission to the Shore Line Motor Coach Company, a subsidiary of the Gary Railways and the Chicago, South Shore & South Bend Railroad. The capital stock of the Calumet Motor Coach Company, which operates ten bus routes in Hammond and adjoining communities, including two lines between Hammond and Chicago, was purchased last July from its former owners by the Midland Utilities Company, an investment company interested in the Shore Line Motor Coach Company and other utilities in that section of Indiana.

In a separate order the commission authorized the Gary Railways and the Chicago, South Shore & South Bend Railroad, each to buy at not less than $10 a share 13,614 shares of common stock of the Shore Line Motor Coach Company. Sale of this stock will enable the latter company to buy the equipment of the Calumet company.

Certificates of convenience and necessity were simultaneously issued by the commission to the Gary Railways authorizing the operation of two new bus routes in the city of Gary.

Bill Would Provide Tax on Buses

Corporation Counsel Countryman of Hartford, Conn., as a private citizen, and not as legal adviser, has drafted a proposed bill concerning the maintenance of highways used by street railways for the transportation of passengers by buses. It provides that for the transporting of passengers by bus over the streets of the city a company will pay to the municipality the cost of maintaining a street area which would be occupied by a single track of street railway plus an additional 16 in.

Changes Made in Lincoln.—The Lincoln Traction Company, Lincoln, Neb., has been given practically a free hand by the Nebraska Railway Commission in rearranging its downtown service by permitting it to add twelve more buses and to dispense with the operation of as many electric cars. Five different lines are affected.

Would Alternate with Buses.—The Northwest Traction Company, a subsidiary of the Puget Sound Power & Light Company, Seattle, operating sixteen round trips daily between Mount Vernon and Bellingham, has been permitted, in an order from the Department of Public Works, to take off half the cars and alternate with buses upon the Pacific Highway connecting Burlington, Skagit County and Bellingham. The application stated that the interurban system had met with greatly decreased earnings during the past several years and that it was thought buses along the highway, which parallel the railway's tracks, would render better service, if alternated with the electric cars, and would result in increased earnings.

Bus Lines Under Consideration.—Monroe, La., is considering a plan for operating bus lines in connection with its Municipal Street Railway. At a meeting of the junior board of the Chamber of Commerce the plan was given approval. It was said that such service would provide the city with fuller facilities on an economical basis. It was pointed out that the rapid growth of the city in recent years had brought into being two or three sections of the city to which street car service was not conveniently available.

Would Substitute Buses.—The street and the public utility committees of the City Council of Gadsden, Ala., it is reported, will take up with the Alabama Power Company the proposition to abandon railway tracks on the Ewing Avenue and Walnut Street lines and substitute bus service. The suggestion to abandon the trolleys was made by President Evan J. Owen of the Council.

Will Purchase Bus Line.—Clark V. Wood, president of the Worcester Consolidated Street Railway, Worcester, Mass., has announced that negotiations have been completed for the purchase by the railway of the Carter Bus Lines, Worcester. The Carter lines operate between Salem Square and the Lake District in Worcester, a large territory not directly served by the Consolidated where there are several hundred permanent residents and a much larger summer colony.

Cars Will Be Abandoned.—The City Council of Mattoon, Ill., has granted the request of the Central Illinois Traction Company to substitute buses for trolley cars in the city of Mattoon. The company recently asserted that for a number of years the lines were being operated at a loss, but of late the deficit reached such proportions that suspension became imperative. The rails will be torn up and trolley poles taken down. Three to four buses will be operated as traffic conditions warrant.

Seeks to Win Bus Grant.—The Grand Rapids Trust Company, receiver for the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., seeking to protect the railway's request for a bus franchise paralleling its route against a similar petition of the Greyhound Bus Line Company, has filed a statement with the Michigan Public Utilities Commission. The interurban company is prepared to put on the highway buses supplementing its railway service within ten days after approval of its application by the commission. Plans hinging on the approval call for hourly service by bus or railway from Grand Rapids, Grand Haven and Muskegon with transfer privileges at junction points.

New Line Opened.—The East St. Louis & Suburban Railway on Jan. 17 opened its bus line between Edwardsville and Glen Carbon, Ill. It replaces a private bus line formerly operated without a certificate from the Illinois Commerce Commission.

Buses Succeed Cars.—The Milford & Uxbridge Street Railway has received permission to abandon its railway lines between Milford and Hopkinton, Mass. Following this approval, the Milford Selectmen granted a permit to the Johnson Bus Lines, Inc., Milford, to operate buses from the Milford-Hopkinton town line to the Milford-Hopedale town line.

Would Run Line Between Olean and Bradford Junction.—The Olean, Bradford & Salamanca Bus Line, Inc., Olean, N. Y., subsidiary of the Olean, Bradford & Salamanca Railway, on Jan. 19, filed a petition with the Public Service Commission for permission to operate a bus line in the city of Olean, town and village of Allegany and the towns of Carrollton and Great Valley and the village of Limestone. This line is to be operated between Olean and Bradford Junction, sometimes called "Seneca Junction," through the village of Limestone to the state line and also to the city of Salamanca. The commission will hold a public hearing.

Financial and Corporate

Hearing on Boston Elevated

First Public Consideration of Matter of Disposition of Property with Passing of Public Control

The proposition to liquidate the present Boston Elevated Railway, Boston, Mass., and organize the Boston Transit System as a new public corporation to take over the business under a term of 40 or 50 years of public control was considered publicly for the first time at a hearing in the Massachusetts Legislature on Jan. 25. It was explained in detail by Henry I. Harriman, chairman of the Metropolitan Planning Division, which sponsors the proposition, and by B. Loring Young, former speaker of the Massachusetts House of Representatives.

The extension of the Boston Elevated, as outlined in the bill, would invade territory that is served by the Eastern Massachusetts and by the railroads entering Boston. Regarding the steam railroads Mr. Harriman told the legislative committee that they are in favor of the proposition as they would welcome being relieved of the burden of passenger service in and near Boston. The Eastern Massachusetts might not be so willing to give up territory to the Boston Elevated.

Briefly, it is proposed to extend the rapid transit lines in Boston from East Boston to Brighton in one direction and from Lechmere Square to Huntington Avenue in another direction, to parallel some of the railroads because of the cheaper cost of construction, and so push the Elevated lines out to Reading and to Winchester and Woburn, run them out to the Waltham branch of the Boston & Maine and to the Newton Circuit of the Boston & Albany. Proposed extensions would make use of existing subways and tunnels in which platforms would be lengthened so as to permit of the operation of four and five-car trains. Surface cars would be taken out of the subways.

Financing of these projects, as they are needed, would be facilitated by the state guarantee back of the new stock issues. This would make these issues almost equivalent to state bonds, carrying a lower dividend rate than the present Elevated Railway stock issues. A part of the saving on stock dividend would go toward a sinking fund with which the Commonwealth of Massachusetts would buy the road at the end of 40 or 50 years.

There will probably be a bitter fight in the Legislature during the next few weeks over these propositions.

Consolidation of Georgia Properties Approved

Preferred and common stockholders of Georgia Railway & Electric Company, Atlanta, Ga., have approved the consolidation of public utility properties acquired by the Georgia Power Company. Other properties involved in the consolidation are East Georgia Power Company, Athens Railway & Electric Company and Rome Railway & Light Company.

Consolidation of the utility interests involves the cancellation of the 999-year lease under which the railways of Atlanta are controlled by the Georgia Railway & Power Company.

Under terms of the consolidation, common stock in the electric company will be exchanged for 6 per cent preferred stock in the Georgia Power Company on the basis of 1½ shares of Power Company preferred for one share of electric company common.

Preferred shares of the electric company will be exchanged for preferred shares in the Georgia Power Company on the basis of one share of 6 per cent preferred for one share of 5 per cent non-cumulative preferred in the electric company.

Before the consolidation can be consummated it will be necessary for the State Public Service Commission to decide whether it is in the public interest.

Good Showing in Grand Rapids

Net Income Was $9,929 in 1926, Compared with $67,541 Deficit in 1925—Approximately 40 Per Cent of Price of New Rail Coaches Paid—Balance Due in Convenient Monthly Payments

GROSS earnings of the Grand Rapids Railway, Grand Rapids, Mich., in 1926 increased $37,978 over 1925. This is noted in the annual report to the stockholders for the year ended Dec. 31, 1926. The number of revenue passengers carried during the year was 19,542,920, an increase of 209,612 over 1925. Local business conditions, in so far as they affected street car riding, were not materially different from those in the preceding year. It was brought out that these increases were attributable largely to the operation, beginning on June 13, 1926, of 27 new type "one-man" cars on three of the principal car lines.

The decrease in operating expenses effected by the use of these 27 new cars could not be shown definitely. The general effect, however, was reflected in the total operating expenses, which, from Jan. 1 to May 31, the five-month period immediately preceding their installation, decreased $8,465 compared with the corresponding period in 1925, whereas for the five-month period from July 1 to Nov. 30, immediately following the installation of the new cars, the decrease was much greater, or $45,170 compared with the corresponding period in 1925. It was fair to assume then, according to General Manager DeLamarter, that more substantial gains in both gross and net would have been made if the new cars had been in continuous service throughout the year.

COMPARATIVE STATEMENT OF INCOME AND EXPENSES OF THE GRAND RAPIDS RAILWAY

Gross Earnings:	1926	1925
Passenger revenue	$1,724,395	$1,697,310
Revenue from special cars	3,480	4,273
Rent of equipment and tracks	38,035	23,994
Non-operating revenue	10,847	13,200
Total	$1,776,758	$1,738,779
Operating expenses and taxes:		
Operating expenses	1,108,709	1,172,157
Taxes	146,287	144,122
Total	$1,254,996	$1,316,279
Gross income available for fixed charges, retirements and dividends	521,761	422,499
Interest on funded debt	261,515	268,248
Interest on unfunded debt	56,609	36,755
Amortization of debt discount	18,577	19,072
Provision for retirements	175,129	165,963
Total interest, other fixed charges and retirements	$511,832	$490,038
Net income	$9,929	*$67,541
Ratio of operating expenses to gross earnings	62.40	67.41
Ratio of operating expenses and taxes to gross earnings	70.63	75.70

*Deficit.

The rates of fare in effect during 1926 were the same as those in effect during 1925, namely, 10 cents individual cash fare and six tickets for 50 cents. Under these rates the company was entitled, according to the terms of its service-at-cost franchise, to earn a return of 7¾ per cent on the value of its property after the deduction of operating expenses, taxes and an amount equal to 3 per cent of the value of the property for retirement reserve. The company's earnings in 1926 available for such return were $105,777 less than those allowed by the franchise.

On the subject of buses the report states that the company operated six passenger buses on five different routes in various sections of the city. One of these routes operated from an outlying district to the business section. The other routes were operated to extend the service of the present railway lines and to transfer their passengers to and from the street cars at intersecting point on the car line. The operation by buses was approximately the same as during 1925, and it is the intention of the management to change or extend bus service to the other parts of the city, when, and as, such service can be justified.

No public financing was done by the company during the year. The cost of the various additions and improvements to the property was provided for partly from earnings, partly from retirement reserve and $159,892 from the unexpended balance of insurance money referred to in the 1925 annual report. The purchase of the new rail coaches was arranged for on a satisfactory basis. Approximately 40 per cent of the purchase price has been paid and the balance is due in convenient monthly payments up to May 26, 1929. During the year the company's bonded indebtedness was further reduced through the retirement by sinking fund of $128,000 first mortgage 7 per cent bonds. This resulted in a total reduction of $223,000 since the bonds were issued in May, 1924.

The additions and improvements referred to aggregated $533,435. Of this amount approximately $370,000 was for the 27 new light-weight, double-truck cars referred to, the remodeling of seven two-man cars for one-man operation and the remainder for track and roadway.

The use of loading platforms and safety zones in the downtown districts was continued throughout 1926 and was helpful in giving the public efficient and safe transportation service. The degree of safety to the public with which service has been rendered in Grand Rapids was indicated by the company's low expenditure for public injuries and damages, it being only 1.32 per cent of the transportation revenue in 1926 and 1.70 per cent in 1925.

Effective June 1, 1926, the company adopted the group life insurance plan for the benefit of its employees and families. Under this plan all employees who are in the service of the company for a year or more receive as a gift life insurance and total and permanent disability protection under a policy issued by the Equitable Life Assurance Society. A feature of the plan is that policies are issued to employees without their undergoing any physical examination, and no employee is excluded on account of advanced age, impaired health or nature of occupation. As of Dec. 31, 1926, a total of 389 employees had received certificates representing a total insurance of $464,100.

Reporting on general conditions, Mr. DeLamarter said that recent surveys in representative cities showed that, compared to motor vehicles, the electric cars carried from 75 per cent to 80 per cent of the riding public in and out of the business centers, and that they occupy only from 10 per cent to 15 per cent of the occupied street areas.

Much space is given in the report to the history of the new electric rail coaches, with copies of testimonials from Grand Rapids residents and letters from automobile dealers praising this type of equipment. Pictures are included showing the new coaches in service.

Receivers Make Favorable Report on Oklahoma Properties

The Oklahoma Railway, Oklahoma City, Okla., during the first eleven months of 1926 carried 13,013,299 revenue passengers, according to W. C. Jones, auditor of the company. This is an increase of nearly 2,000,000 over a similar period of 1925. G. A. Henshaw and G. T. Lackey, joint receivers of the company, attribute a great part of the increase to the many improvements made in the service of the company on its city and interurban lines. They state that a 35 per cent increase was made in railway service and twenty buses were put in operation on five lines. The buses have materially increased the company's profit according to the receivers. Other factors which have contributed to improvement of the financial condition of the railway, according to the receivers, are the increasing seriousness of the parking problem and the enormous advantage of the street car over the automobile from the cost standpoint.

Rhode Island Merger Approved

Stockholders of the New England Power Association approved the purchase of the entire issue of class B stock of the Rhode Island Public Service Company, Providence, R. I., at a special meeting held recently. The Rhode Island Public Service was recently formed to acquire control of the Narragansett Electric Lighting Company, which does the electric and gas business, and the United Electric Railways, which operates the traction lines and buses in the city of Providence.

A statement issued by the New England Power Association says that more than 95 per cent of the United Electric Railways stock and Narragansett Electric Lighting Company stock is available for carrying out the plan and agreement of July 28, 1926, subject to the right of withdrawal. To enable the merger to become effective, a modification to the plan and agreement has been announced permitting the issue of collateral bonds in lieu of the first mortgage bonds originally contemplated. Under the plan, the railway's stockholders have until Jan. 28 to withdraw their shares.

By reason of the facilities enjoyed by the New England Power Association a reduction in lighting rates will be made on or before the close of the present year.

Stockholders also voted to increase the number of directors to enable representation of Rhode Island interests on the board.

End of Public Control of Eastern Massachusetts Near

It is a matter of comment that while there is a great deal of commotion in Boston over the future of the Boston Elevated Railway, Boston, Mass., nothing has apparently been done by anybody to take care of the Eastern Massachusetts Street Railway when the public control of that road terminates two years hence.

The difference in status between the Elevated and the Eastern Massachusetts is that in the case of the Elevated the public control continues automatically at the end of the ten-year period unless the Legislature takes specific action to terminate it. On the other hand, in the case of the Eastern Massachusetts Street Railway the public control terminates automatically unless the Legislature takes measures to continue it.

Unless something is done very soon the public control of the Eastern Massachusetts will end on Jan. 1, 1929, and the property will go back to the stockholders. The public trustees who are now operating the road do not want to take any action, lest it be interpreted as a move to influence their own terms of office. The directors and stockholders have not asked for any new legislation.

A controversy has developed between the trustees and the directors over the bus service policy. The directors say that the trustees have gone too far in allowing the New York, New Haven & Hartford to operate buses in the field which is served by the Eastern Massachusetts, and a movement has been started among the stockholders to organize an independent bus service in competition with the New Haven Railroad buses for the purpose of protecting the property of the Eastern Massachusetts. At the end of the public control period on Jan. 1, 1929, the bus lines and property would be turned over to the Eastern Massachusetts without any profit to the interests organizing these bus lines. The stockholders who are interested in this move have engaged Henry H. Hurlburt as counsel.

Initial Dividend by Philadelphia & Western Railroad

The Philadelphia & Western Railway Company, Philadelphia, Pa., on Jan. 25 declared an initial dividend of 50 cents on the common stock, payable on Feb. 15 to shareholders of record Feb. 5. The company operates out of Philadelphia from a connection with the Philadelphia Rapid Transit Company at the 69th Street Terminal to Strafford and from Villa Nova to Norristown. The system comprises 38 miles of track.

Liquidating the Chautauqua Traction Company

The property of the Chautauqua Traction Company, Jamestown, N. Y., is being dismantled and the net proceeds from the sale of the equipment will be used to retire the bonds, which are in default. The company's first mortgage 5 per cent gold bonds due on April 1, 1934, are almost entirely held by members of the Broadhead family or affiliated interests. Members of this Broadhead family are the sole stockholders of the Chautauqua Traction Company and are the sole owners of affiliated traction lines. Owing to the manner in which these bonds are held there has been no foreclosure, as it was desired to liquidate in the least expensive manner possible.

$18,199,200 of B.-M.T. Bonds on Sale

Offering of $18,199,200 par value of 6 per cent sinking fund gold bonds, series A, due on July 1, 1968, of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., is to be made by the War Finance Corporation it was announced on Jan. 13 by Secretary of the Treasury Mellon, who is chairman of the latter corporation, which has been ordered to wind up it affairs.

These bonds are part of an authorized Brooklyn-Manhattan Transit issue of $250,000,000 dated July 2, 1923, of which $92,543,500 is outstanding. The War Finance Corporation's holdings represent a loan made to the old Brooklyn Rapid Transit Company in the war period to enable the company to carry on subway work then in progress, which the government had approved as "necessary private construction." The raising of all private capital had been prohibited in order to give the full market to the Liberty Loans, and the only way in which the Rapid Transit company could raise the funds was through a loan from the War Finance Corporation. It had a note issue of about $60,000,000 coming due and the War Finance Corporation agreed to advance 30 per cent of the funds, the note holders accepting an extension covering the remaining 70 per cent.

The bonds now being offered are in coupon form. They consist of 18,999 bonds of a par value of $1,000 each and two of $100 each. The Federal Reserve Bank of New York holds them as custodian and fiscal agent of the War Finance Corporation. The price is 99½ and interest.

Dividend Cut by Brooklyn City Railroad

The Brooklyn City Railroad, Brooklyn, N. Y., on Jan. 25 declared a quarterly dividend of 10 cents on the capital stock. Previously 20 cents was paid quarterly. In explaining the reduction the company issued the following statement:

> The Brooklyn City Railroad and the B.-M. T. have applied to the Board of Estimate for franchises to operate buses in Brooklyn. In view of the large investments the Brooklyn City Railroad may be confronted with in this connection the directors deem it advisable to pursue a more conservative policy as to dividends at this time.

The company has only one class of stock outstanding. It is of a par value of $10 a share.

Last Step Effected in New Haven Control

The Public Utilities Commission of Massachusetts has approved the acquisition of stock of the New England Investment & Security Company by the New York, New Haven & Hartford as the final chapter in the return of the control of the Springfield Street Railway, Springfield, and the Worcester Consolidated Street Railway, Worcester, to the New York, New Haven & Hartford Railroad. The commission approves the acquisition of $300,000 first mortgage bonds of the Springfield Street Railway; authorizes the issue of shares of preferred stock of the New England Investment & Security Company and authorizes the acquisition of outstanding shares of common stock of the New England company.

Financial Situation on Boston Property Revealed

The application of Franklin T. Miller, receiver of the Boston & Worcester Street Railway, Boston, Mass., to issue receiver's certificates for $100,000 to finance continued operation has been denied. The receiver has now applied to the court for authority temporarily to suspend all electric railway service, with permission, however, to resume operation between Boston and Wellesley Hills and possibly South Framingham as soon as arrangements for electric power can be made. If buses are continued and cars are operated only between Boston and Wellesley a monthly profit of $3,400 is indicated. If buses are operated to the exclusion of the railway it is figured by the receiver there would be a monthly gain of about $6,700. Since Feb. 11, 1925, when Mr. Miller assumed the duties of receiver, to Nov. 30, 1926, total losses were $57,924. The financial situation of the company was made plain in Mr. Miller's seventh report filed in the Supreme Court wherein he asked authority to issue receiver's certificates.

In connection with Receiver Miller's petition Roland W. Boyden, appearing for the American Trust Company, trustee for the $2,500,000 of the bonds, said that the loss was not so great as it might seem. He said that a committee of bondholders was trying to complete arrangements to continue the company. He complimented Mr. Miller on his work as a receiver. One of Mr. Boyden's suggestions was that Mr. Miller be allowed to issue certificates of indebtedness, but the court declined to sanction this.

Mayor Temple of Marlboro and officials of the towns of Framingham, Shrewsbury and Hopkinton opposed the proposed substitution of buses for electric cars. They said the bus service would not be adequate for the factory employees.

After the hearing Judge Carroll said it was a serious matter for the court to take the responsibility of continuing a public service corporation which is being run at a loss, and he suggested to certain lawyers interested in the affairs of the railway that they try to devise a plan for the operation of the road. If they cannot agree about the matter in the course of a month the court may grant permission to abandon the service.

Chicago South Side Surface Lines to Pay Interest

A statement indicating that the south side surface lines at Chicago may seek their way out of the present traction difficulty without a receivership has been addressed to bondholders of the companies by Leonard A. Busby, president. The interest on the $33,926,000 bonds of the Chicago City Railway and the Calumet & South Chicago Railway, which matures on Feb. 1, will be paid promptly, but the principal will be defaulted, the statement said. It added that the interest will continue to be paid until the city and the companies reach an agreement and new bonds are issued for the present liens.

A. L. Drum Made Detroit United Receiver

W. C. Dunbar and the Security Trust Company, Detroit, Mich., have resigned as receivers of the Detroit United Railway, and A. L. Drum, who has been acting as executive manager, has been appointed receiver by the federal court. Mr. Drum's appointment combines the duties of operation and reorganization under one head.

The plan of reorganization worked out by the former receivers proved impracticable. It has been abandoned. According to the former receivers, the working out of the facts and circumstances bearing on the rights and relationship of parties at interest has been largely accomplished, though for the most part not yet adjudicated. The executory contracts existing at the time of the receivership have been either rejected or adjusted and put upon a permanent basis. The primary function of the receivership for some time to come will be the operation of the railway.

The receivers are, therefore, of the view that under such conditions the expense of conducting such receivership ought to be minimized by cutting off so far as practicable all expenses other than for operation. That is their reasons for tendering their resignations.

Traffic on the Increase.—Reports of the Illinois Power & Light Corporation for the first eleven months of 1926 in Decatur, Ill., show gains in numbers of both street car and bus passengers. The buses carried 2,827,000 passengers during the period and the cars 5,569,000 passengers. Ten buses and 22 cars were in service and buses averaged 5.4 miles to the gallon, while the tire mileage was between 21,000 and 22,000.

Traffic Gains.—The lines of the Chicago & Joliet Electric Railway carried nearly 7,000,000 people in Joliet, Ill., last year and the interurban system, the Illinois Traction, carried 2,500,000. The totals exceeded any year since 1920 and indicated steady increase throughout the year with a sharp upturn in the last weeks of the year. Freight gains were marked, too, and from this source the traction officials reported a slight increase in the net earnings of the company for the year.

Railway Issues Increase.—The California Railroad Commission during the twelve months ended Dec. 31, 1926, authorized the issue of $158,012,522 of stock, bonds, notes and other evidences of indebtedness. Of this amount $5,700,000 was issued by electric railways. In 1925 the total amount was $132,037,049, of which the electric railways issued $3,610,461.

Does Big Holiday Job.—The Public Service Railway, Newark, N. J., played an important part in the great holiday trade done during the week preceding Christmas, 1926. Its cars and buses made it possible for more shoppers to get to and from the stores than in any previous holiday season in the history of the company. In commenting on this situation M. R. Boylan, who directs operation, said that for the six business days immediately preceding Christmas the company transported 11,945,380 passengers, or an average of 1,990,896. He said that this figure was nearly 300,000 riders a day in excess of the normal average. The heaviest day's riding was the Saturday before Christmas, which condition, he believed, showed that the "do your shopping early" idea was beginning to take hold.

Traffic on the Increase in Madison.—A gain of 64,737 railway and bus passengers was made by the Madison Railways, Madison, Wis., in December, 1926, over the corresponding month of 1925, when 605,864 patrons were carried. Of the 670,601 passengers carried during the last month of 1926, 609,643 used the street cars. Gross railway and coach revenues for December, 1926, were $45,545, against $41,108 in December, 1925. Gross railway revenue for December, 1926, was $41,025, compared with $38,212 for December, 1925.

Personal Items

J. A. Ritchie and P. W. Seiler in New Posts with Yellow Coach

John Hertz, chairman of the board of directors of the Yellow Truck & Coach Manufacturing Company, Chicago, Ill., announced on Jan. 22 important changes in the personnel of that company. John A. Ritchie has been made vice-chairman of the board of directors and Paul W. Seiler has been elected president and general manager.

Mr. Hertz said that the change was made in order to enable Mr. Ritchie to devote more time to the sales end of the coach business, because of the general nation-wide demand for coach service at this time. Mr. Ritchie is president of the Chicago Motor Coach Company and chairman of the board of directors of the Fifth Avenue Coach Company, New York. He will continue in these capacities. Mr. Hertz said:

P. W. Seiler

> Mr. Ritchie will serve as vice-chairman of the board of directors. This will enable him to share with me some of the work that I have been giving personal attention.

Mr. Seiler, the new president and general manager, is one of the youngest chief executives in the General Motors fold. He has been president and general manager of the Ternstedt Manufacturing Company, a subsidiary of Fisher Body Corporation, the largest manufacturer of automobile body hardware in the world.

Changes in United Light & Power Company Announced

Important changes in the personnel and promotions in the officers' ranks of the United Light & Power Company, with main office in Chicago, Ill., will occur on Feb. 1. Only slightly is the railway department affected by these changes.

T. C. Roderick, who has been general manager of the Tri-City Railway of Illinois, stationed at Rock Island, Ill., will leave the railway division and enter the gas division as general manager of the Ottumwa Gas Company, succeeding Mr. Wuestenfeld. Mr. Roderick went to the United Light several years ago from the Grand Rapids Railway.

R. J. Smith, who has been manager of the Tri-City Railway of Iowa, also becomes general manager of the Tri-City Railway of Illinois. Both the Iowa and Illinois traction lines of the Tri-Cities and the Clinton, Davenport & Muscatine Interurban Railway will be under his charge. He succeeds to the responsibilities that formerly were Mr. Roderick's.

F. A. Nolan Assistant to Detroit Municipal Manager

Fred A. Nolan, who has been connected with the Department of Street Railways at Detroit, Mich., since its inception, has been named assistant to the general manager by the Street Railway Commission. The commission's action was taken upon the recommendation of Del A. Smith, acting general manager, to fill the vacancy caused by the appointment of Frank J. Denny, formerly assistant to the general manager, to the position of director of publicity. Mr. Nolan was formerly an assistant auditor for the municipal railway.

Jurisdiction of Officers of Atlanta Company Widened

F. L. Butler, vice-president and manager of the railway department of the Georgia Railway & Power Company, Atlanta, Ga., will have general charge and supervision of the operation, maintenance and construction of the railway properties of the Athens Railway & Electric Company and the Rome Railway & Light Company.

W. P. Hammond, assistant chief engineer of the Georgia Railway & Power Company, has been placed in general charge and supervision of all electrical engineering and construction outside the seven-mile zone for the Georgia Railway & Power Company, Atlanta; Athens Railway & Electric Company, Georgia-Southern Power Company, Rome Railway & Light Company, the Georgia Utilities Company and Mutual Light & Water Company.

C. E. Bennett, manager of the electrical department of the Georgia Railway & Power Company, has been placed in general charge of all electrical operation, maintenance, engineering and construction within the seven-mile zone. He will also have general charge and supervision of all operation and maintenance of the electric transmission and distribution system of the Georgia Railway & Power Company outside the seven-mile zone, and in addition the electric transmission and distribution systems of the Athens Railway & Electric Company and other utilities in the group.

C. A. Collier, general sales manager of the Georgia Railway & Power Company, has been placed in charge of all sales activities of the Athens Railway & Electric Company, the Athens Gas, Light & Fuel Company, the Georgia-Southern Power Company, the Rome Railway & Light Company, the Georgia Utilities Company and the Mutual Light & Water Company.

These changes are all apparently made in consonance with the deal under which the Georgia Power Company, acting for the Southeastern Power & Light Company, has acquired the Georgia Railway & Power Company, the Athens Railway & Electric Company, the Rome Railway & Light Company, the East Georgia Power Company and other properties.

Clarence E. Mitten Goes to Buffalo

Clarence E. Mitten has been appointed passenger traffic manager of the International Railway, Buffalo, N. Y. He will handle both electric and bus transportation and will report direct to President Yungbluth. Mr. Mitten's appointment was announced by President Yungbluth.

C. E. Mitten

Mr. Mitten goes to the International Railway organization from the Chicago & Eastern Illinois Railroad, where he has had twenty years' experience. His latest position in that organization was assistant superintendent of transportation. The new passenger traffic manager will make his headquarters in Buffalo.

P. H. Gadsden Nominated for Chamber of Commerce

Philip H. Gadsden, a vice-president of the United Gas Improvement Company, Philadelphia, and former president of the American Electric Railway Association, has again been nominated for election as a director of the United States Chamber of Commerce. Mr. Gadsden is a candidate to represent the second election district on the board. For some years Mr. Gadsden has been prominently identified with the national chamber, having been elected as a director in 1920. In addition, he became a director of the Philadelphia Chamber of Commerce in that same year, subsequently being elected vice-president, and early last year president. He has also served as a director of the Pennsylvania State Chamber of Commerce.

During the war Mr. Gadsden served as chairman of the National Committee on Public Utility Conditions, representing the interests of the electric railway and gas companies in connection with their war problems. A native of South Carolina and a lawyer by profession, Mr. Gadsden retired from the active practice of law to manage and direct local public utilities. It was in 1918 that he was elected to a vice-presidency in the United Gas Improvement Company in charge of its department of public relations.

W. J. Harvie with Albany Company

William J. Harvie, formerly general manager of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., has been made assistant general manager of the United Traction Company, Albany, N. Y., and its associated electric railway properties. Mr. Harvie's duties in this position will have to do particularly with the supervision of matters relating to safety, claims and the personnel. Beginning Jan. 1, 1927, the United Traction Company resumed its direct liability for claims, which for some years past had been covered by an accident insurance policy, and decided to place primary responsibility for the reduction of accidents and its allied problems, such as personnel and the engagement of platform men, directly upon one official. This decision accounted largely for the appointment of Mr. Harvie, whose extended experience in railway operation well fits him for this work.

Pierre Mariage a Visitor to United States

Pierre Mariage, who is associated with the Paris street railway and omnibus system and is manager of its allied car building company, la Société de Construction et d'Entrétien de Matériel Industrial et Agricole, has been spending a few weeks in this country inspecting electric railway and bus systems. Mr. Mariage was one of the official delegates from France attending the third World Motor Transport Congress held in New York Jan. 10 to 12. Later he visited various American cities, including Chicago, Detroit, Philadelphia, and Newark, N. J., studying car and bus design and operation. He sailed for Paris on Jan. 29. Mr. Mariage is the son of A. Mariage, chairman of the board of the Société des Transports en Commun de la Région Parisienne, which operates all of the tram lines and bus lines in Paris.

Henry W. Smith has been appointed general passenger and freight agent of the Chicago, South Bend & Northern Indiana Railway and Southern Michigan Railway, both of South Bend, Ind. He succeeds in this capacity the late John S. Moore. Following his graduation from Hanover College Mr. Smith spent a year and a half with the Snell Manufacturing Company, but left that concern to accept an appointment with the Chicago, South Bend & Northern Indiana Railway in 1910. During that time he secured a broad experience in the electric railway freight and passenger business, as he started in the freight department and worked his way up to the position of assistant auditor. The latter position he has held continuously since 1918.

OBITUARY

Anson W. Burchard

Vice-Chairman of Board of the General Electric Company Succumbs in New York at the Age of 61—Constructive Force in Industry—Sketch of His Business Career

ANSON WOOD BURCHARD, vice-chairman of the board of directors and chairman of the executive committee of the General Electric Company and chairman of the board of directors of the International General Electric Company, died on Saturday afternoon, Jan. 22, of acute indigestion, at the home in New York City of Mortimer L. Schiff, with whom he was lunching.

A. W. Burchard

Mr. Burchard was regarded by his associates as a man with a superior degree of executive ability. His contributions to industry progress, particularly progress in the light and power field, were great and lasting. His activities in welding together corporations and manufacturing organizations made the work of standardization and simplification that much easier, and from it therefore not only the electrical industry but the purchasers of electric lamps and apparatus derived advantage. Toward the establishment of an ideal business and manufacturing enterprise in which the seller and buyer both gain Mr. Burchard's contributions were priceless. He was especially skilled as an organizer, and his abilities were recognized abroad as well as at home. In the domain of corporate finance he was most versatile, and he was better known in the offices of the holding companies and large corporations than among the rank and file of utility operators. His counsel was sought by numerous interests outside the immediate sphere of his activity.

Men associated with Mr. Burchard in business and others who had come to know him, even those whose contacts with him were not so close as were those of his fellow officers, all were unstinted in their praise of Mr. Burchard as a man and of him as a constructive force in industry.

In co-operation with the late Charles A. Coffin, founder of the General Electric Company, he laid out a policy of development of the financial resources of electric public utilities, enabling them to arrange credits and buy more easily, and thereby stimulated the expansion of the industry. He was also active twenty years ago in the consolidation of the many manufacturing units of the General Electric Company, such as the Stanley Electric Company, the Fort Wayne Electric Company, the General Incandescent Arc Lighting Company, the Northern Electric Company and the Sprague Electric Company.

Mr. Burchard was born at Hoosick Falls, N. Y., on April 21, 1865. After graduation from the high school there, he entered Stevens Institute of Technology, where he was graduated in 1885 with the degree of mechanical engineer. He entered business with the J. M. Ives Company, a steam and general factory engineering firm at Danbury, Conn. In 1891 he became treasurer and manager of the T. & B. Tool Company of Danbury, where he remained until 1900, when he became vice-president of the Cananea Consolidated Copper Company, operating mines at Cananea, in the State of Sonora, Mexico.

WITH THE GENERAL ELECTRIC COMPANY NEARLY TWENTY-FIVE YEARS

After filling this post for two years, Mr. Burchard in 1902 joined the General Electric Company. Until 1904 he was comptroller, with headquarters at Schenectady. In that year he was named assistant to the president, in 1912 he was elected vice-president, and in 1917 he was made a member of the board of directors. In May, 1922, he was elected vice-chairman of the board, and in June of the same year he was elected president and chairman of the board of directors of the International General Electric Company. About a year ago he was relieved of the duties of president but continued as chairman of the board. During the war he acted as assistant to Benedict Crowell, director of munitions.

Mr. Burchard was a director of several utility and electrical companies and a member of many electrical and power clubs and organizations including the A.I.E.E. and the A.S.M.E.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

South Shore Starts Big Improvement Program

An extensive equipment and building program has recently been undertaken by the Chicago, South Shore & South Bend Railroad. Twenty new passenger cars have been ordered by the company from the Pullman Car & Manufacturing Corporation. Ten will be equipped as motor cars and the rest will be used as trailers. In addition plans were announced for a new two-story passenger station at Michigan City, Ind., to be used jointly by the Chicago, South Shore & South Bend Railroad and the Shore Line Motor Coach Company.

The new cars will be equipped with bucket type seats, upholstered in gray mohair velvet, both automatic electric and circulating hot water systems, walnut finish interior woodwork, electric fans, battleship linoleum flooring, dome lighting, adequate toilet facilities and an inclosed smoking compartment similar to those in Pullman cars. Motor and other electrical and mechanical equipment will be the same as on the cars now in use. Two dining cars and two parlor observation cars will be placed in service in February, and with the delivery of the new cars in the early summer will bring the total cost of passenger equipment placed in service since the present management began operation, to $2,069,000.

The cars will be 1 ft. longer than the present equipment and will have vestibules, with diaphragms between cars providing protection for passengers passing through the train.

Cost of the passenger station is estimated at approximately $200,000, and construction work, it is said, will be begun at once. The Michigan City station is an important transfer point, as motor coach passengers traveling between Chicago and western Michigan have the option of riding between Chicago and Michigan City on the first electric train of the South Shore line, thus saving at least an hour of travel.

A site for the improvement has been secured across the street from the present South Shore station, where a large parking and loading space for motor coaches will be provided directly north of the structure.

The rapid growth in passenger traffic, and the even greater increase indicated for the coming months, makes the purchase of the additional equipment necessary according to Charles H. Jones, general manager.

"On several occasions," Mr. Jones states, "during the fall and winter, when travel has been exceptionally heavy, nearly every car owned by the company has been placed in service for the traffic. This is a very good demonstration of the popularity of our service in the growing territory served.

"Basing our judgment of the future on this past popularity, the new equipment is being purchased in order that South Shore Line service will remain on a plane of equality with that of any other railroad in the country."

Market Street Railways Places Large Order for Seats

Market Street Railway, San Francisco, Cal., recently set in motion its 1927 improvement program by placing an order for 1,278 spring cushion seats with Hale & Kilburn of Philadelphia. Of the lot, 730 covered with genuine green leather are to be installed in the inclosed sections of 73 cars. The remaining 548 seats of the cane-covered type will be used in open car sections. Announcement also has been made that the 37 cars now in service will be rehabilitated, which with the cost of the new seats, estimated at $35,000, will bring expenditures for 1927 up to $53,000. When finished, the cars are to serve the Mission and Sunset districts.

50 De Luxe Cars Ordered by Eastern Massachusetts Railway

Eastern Massachusetts Street Railway has authorized the remodeling of 50 cars along lines similar to the de luxe cars now operating on its suburban routes. Orders also have been placed for 50 additional, double-truck light-weight de luxe cars to be delivered early this year. These cars will be provided with de luxe seats and Pullman type of rubber floor covering. This will have an interior finish of genuine mahogany and are to be lighted with five Pullman type dome fixtures, each fixture containing a 94-watt compensated lamp. When delivered, the company will have 100 cars of the de luxe type, which it is understood will take care of the larger portion of the so-called suburban service and will replace 50 of the old style, heavy double-truck type.

General Electric Saves Customers $12,000,000

General Electric Company for the year ending Dec. 31, 1926, reports orders totaling $327,400,207, an increase of 8 per cent, or nearly $25,000,000 over 1925. President Gerard Swope states that this is the biggest volume of orders in the company's history, the previous high mark, achieved in 1920, being $318,470,000, or about $10,000,000 below the new record. "On the basis of the 1926 volume of sales, price reductions during the year have resulted in an annual saving to the company's customers of upward of $12,000,000," said Mr. Swope. "This is a result of improved design, better methods of manufacture, numerous suggestions from the workmen which have reduced costs, reflected in lower selling prices to customers."

United Traction Company Orders Twenty Mack Buses

United Traction Company of Albany, N. Y., has just ordered twenty new Mack six-cylinder gas-electric buses of the 29 passenger standard city type. The new equipment will have General Electric generators, model DT-1115, 190-volt, 200-amp., 1,140 r.p.m. and the motors will be GE single 115-120-volt, 240-amp., 1,880 r.p.m. These buses will be operated by the Capital District Transportation Company, a subsidiary of the United Traction Company.

St. Louis, Troy & Eastern Lets $1,000,000 Bridge Contract

General contract for the construction of a 7,400-ft. elevated steel and trestle railroad approach to the McKinley Bridge at Venice, Ill., was awarded recently to the Fruin-Colmon Contracting Company of St. Louis by the Illinois Power & Light Corporation, for its subsidiary company, the St. Louis, Troy & Eastern Railroad. The project will cost approximately one million dollars, and will enable the St. Louis, Troy & Eastern to avoid numerous grade crossings with other railroads in Madison and Venice, Ill. When the McKinley Bridge was constructed provision was made for the installation of such an elevated approach from the Illinois side, and this approach will be used for limited passenger and freight traffic by the Illinois Traction system. Construction work will start in the early spring.

$400,000 Plant for Georgia Railway & Power Company

Georgia Railway & Power Company, Atlanta, Ga., will start work early in February on its Cherokee storage plant which will include carhouses, shop buildings, a welding plant, a storehouse, and an athletic field for employees. An appropriation of $400,000 has been set aside for this work, exclusive of the cost of the land. A 41-acre tract on the Atlanta-West Point line between Green Street and South Boulevard has been chosen as the site of the new project, said to be one of the largest undertaken by a Southern utility.

Ten Modern Cars Ordered by Gary Railways

An order for nine new light-weight, one-man, double-truck safety cars for service on city lines in Gary and an additional interurban car for the Hammond division was placed on Jan. 22 by the Gary Railways. The new cars will be built by the Cummings Car & Coach Company at Paris, Ill., at an estimated cost of $166,000.

Specifications for the city type equipment call for an attractive streamline car weighing only 36,000 lb., equipped with four 35-hp. General Electric motors, deep-spring plush seats, pneumatic sliding doors and rear exit treadles, and capable of seating 56 passengers. The single new 46-passenger interurban will be similar in dimension and weight to the seven modern safety cars placed in twenty-minute service early this month between Gary and Hammond. Material savings in power, maintenance and platform expense are anticipated from the operation of both types of rolling stock.

Twelve New One-Man Cars Added to Scranton Railway

New Equipment Puts Fitkin Interests One Step Nearer the Goal of One-Man Operation—Management Sees Bright Outlook for 1927—Business Normal After Revenue Decrease During 1925 Strike

DELIVERY of twelve new interurban cars to the Scranton Railway during December marks another step toward 100 per cent one-man operation on this important property of the Fitkin interests.

The new rolling stock, which is of the one-man, two-man type, was built by the Osgood-Bradley Company, which late in 1925 made delivery of a number of cars of a somewhat similar design to the Scranton Railway, Altoona & Logan Valley Electric Railway and Youngstown & Suburban Railway. Details of these units were covered in ELECTRIC RAILWAY JOURNAL of Aug. 14, 1925, at which time it was announced that they had replaced single-truck wooden cars and double-truck heavy units.

In over-all length, height and width the units delivered last month are slightly different from standards set by the A.E.R.A., and there is also provision for seating four more passengers than have been specified by the association for this type of car. The bodies are of semi-steel construction with arch type roofs, the interior trim being of mahogany. The power equipment consists of four Westinghouse 510A motors. The units are for city service. Complete specifications of the car are as follows:

Seating capacity	44
Weight:	
Body equipped	20,000 lb.
Trucks with motors	15,800 lb.
Total	35,800 lb.
Bolster centers, length	21 ft. 4½ in.
Length over all	41 ft. 10 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 5 in.
Height rail to trolley base	11 ft. 1½ in.

Typical Interior of the Twelve Cars Recently Delivered to the Scranton Railways by the Osgood-Bradley Car Company for City Service

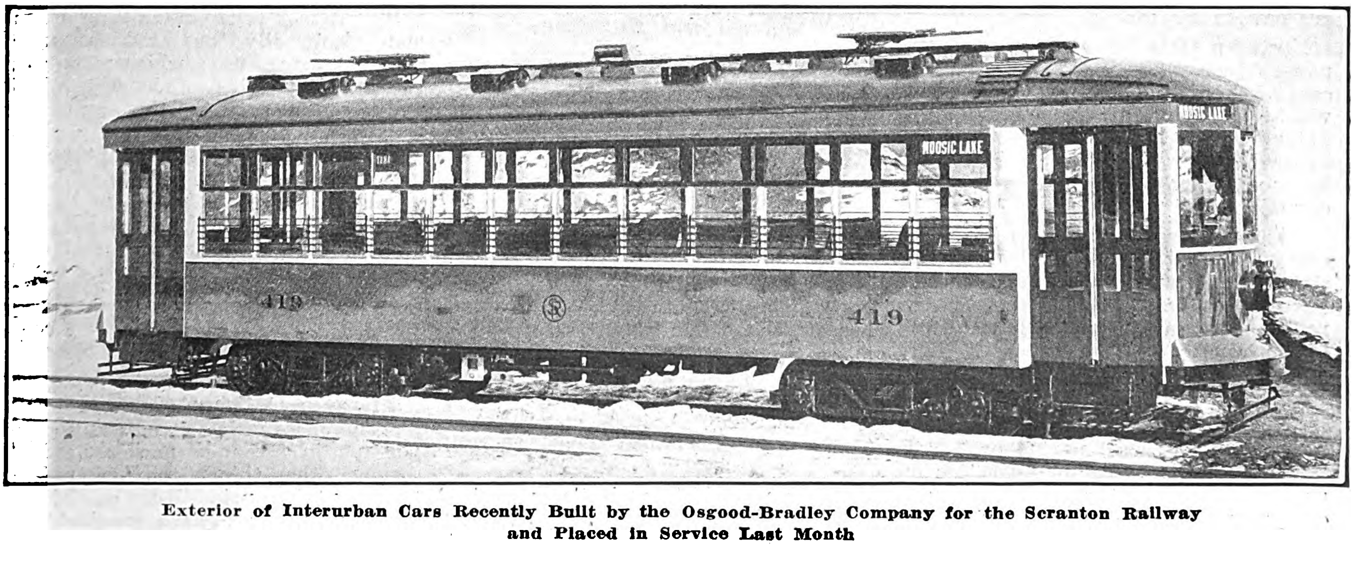
Body	Semi-steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse Traction Brake Co.
Armature bearings	Plain
Axles	A.E.R.A. standard E-2
Bumpers	Osgood-Bradley standard
Car signal system	Faraday
Car trimmings	J. L. Howard & Co.
Center and side bearings	Osgood-Bradley
Compressors	Westinghouse DH-16
Conduit and Junction boxes	Osgood-Bradley
Control	Westinghouse K-35
Couplers	Osgood-Bradley
Curtain fixtures	Morton Mfg. Co.
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic
Fare boxes	Cleveland
Fenders	Root
Finish	Pratt & Lambert enamel
Gears and pinions	Tool Steel Gear & Pinion Company
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Ohio Brass Gold Ray
Journal bearings	A.E.R.A. type 3½ in. x 6 in.
Journal boxes	Symington
Lightning arrester	Aluminum cell
Motors	Four Westinghouse 510-A, inside hung
Safety devices	Safety Car Devices Co.
Sanders	Osgood-Bradley
Sash fixtures	O. M. Edwards Co.
Seats	Heywood-Wakefield Co.
Seating material	Leather
Slack adjuster	Osgood-Bradley
Springs	Fort Pitt and Railway Steel Spring Co.
Step treads	Kass
Trolley catchers	Earll
Trolley bases	Ohio Brass
Trolley wheels	Jones
Trucks	Osgood-Bradley OBC-48-66-G
Ventilators	Garland C-1 Jr.
Wheels	Steel Car Forge, 26 in. dia.

Although too early to compile figures showing savings in operation effected by these cars, officials of the Fitkin management have some interesting data on which to back their faith in one-man operation.

NEW CARS PRODUCE $198,000 ADDED REVENUE

In connection with the cars purchased in 1925, some of which were put in service on the Greenridge, Peoples and Dunmore suburban lines, there was an expense decrease and an operating revenue increase, resulting in an annual revenue increase of $198,000 as of Nov. 1, 1926. Incidentally, the operation of the cars of the new type have shown 13 per cent increase in passengers carried as of April, 1926, based on a mileage of 150 miles a day and an eighteen-hour operation.

According to officials of the company, the coal strike of 1925 afforded some valuable tests in the way of proving the efficiency of one-man operation. When the strike commenced, in Sept. 1, 1925, steps were taken to cut operating expenses, which resulted in the immediate rehabilitation of rolling stock to the one-man car design, these cars being equipped with all safety appliances. With the new cars operating 500,000 hours during the period from Sept. 1, 1925, to Feb. 1, 1926, when the strike was terminated, there was a saving of $158,000 in labor and platform expense, the saving in plat-



Exterior of Interurban Cars Recently Built by the Osgood-Bradley Company for the Scranton Railway and Placed in Service Last Month form expense being estimated at approximately 30 cents an hour.

Some idea of the value of this saving may be gained when it is known that for the year ended Aug. 31, 1926, the Scranton Railway, due to the strike and general unrest preceding it, showed a decrease in earnings of nearly 9 per cent as compared with the preceding year. For the specific duration of the strike the decrease was $150,000.

In spite of this the Fitkin interests spent more than $600,000 for new equipment, etc., during 1926, this figure being divided as follows: Equipment, $225,000; track and roadway, $335,000; overhead, $20,000; miscellaneous, $10,000. As mentioned in the JOURNAL for Dec. 18, 1926, the company built ten new car bodies in its own shops last year. Ten additional bodies will be constructed during 1927. Due to a favorable wage agreement recently effected with the miners, the officials see a prosperous year ahead for their properties in the region contingent to the mining district. Figures as to the possible expenditures for equipment and improvements for 1927 are now being compiled and it is understood will be announced in the near future.

Westinghouse's Orders for Last Quarter 1926 Nearly $50,000,000

Orders booked by the Westinghouse Electric & Manufacturing Company in the three months ending Dec. 31, with December orders estimated at $16,390,000, were approximately $49,825,000, it was announced recently. Of this total $16,193,654 represented orders from the electric railway and allied fields. The total order figure as compared with $39,770,000 in the corresponding quarter of the preceding year, shows an advance of more than 26 per cent.

Rolling Stock

Georgia Railway & Power Company, Atlanta, Ga., has assigned safety cars to its River and Soldiers' Home-English Avenue lines, which brings the number of Atlanta lines on which the new cars are in operation to eleven. This means that all of the 100 safety cars bought during the past two years are now in service.

Northern Ohio Power & Light Company, Akron, Ohio, is reconstructing 46 cars of the type known as "600." They will be made into a type similar to the Peter Witt car. At the same time the Peter Witt cars on the property are being equipped with all known safety devices.

Boston Elevated Railway has purchased a Mack gas-electric bus of the standard 29-passenger city type. The bus will make 24 daily trips on the route between Howard Square and Union Square. This is the 88th Mack bus purchased by the company, but the first of the gas-electric type.

Lincoln Traction Company, Lincoln, Neb., has purchased six 25-passenger Mack city type buses for operation on various routes in the city. The new equipment will be placed on routes known locally as Lancaster Agriculture College and University Place.

Metal, Coal and Material Prices

Metals—New York	Jan. 25, 1927
Copper, electrolytic, cents per lb	13.00
Copper wire, cents per lb	15.25
Lead, cents per lb	7.40
Zinc, cents per lb	6.72
Tin, Straits, cents per lb	64.875
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.325
Somerset mine run, Boston, net tons	2.575
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N.Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb	11.00
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.81

Fageol Company, Kent, Ohio, reports the delivery of four auto buses to the Scranton Railway and six buses to the Department of Street Railways, City of Detroit, between Dec. 1 and 15.

Fageol Motors Company of California delivered fourteen buses to the Key System Transit Company and three buses to the Los Angeles Railway during December, 1926. All were of the six-cylinder street car type.

Tri-City Railway Company of Iowa has purchased a 29-passenger bus from the Mack Corporation for operation on the Fejevary Park and LeClaire Street route.

Track and Line

Philadelphia Rapid Transit Company, Philadelphia, Pa., is requested by Councilmen Daly, Crossan and McKinley to extend its Front Street railway from Tioga Street to Rising Sun Avenue. This will provide better facilities for Fox Chase residents who wish a more direct route to the Frankford Elevated station at Front and York Streets.

Philadelphia Rapid Transit Company, Philadelphia, Pa., will extend the Erie Avenue line to the Frankford elevated system. The work is to be completed and ready for operation in October. This two-track extension on Erie Avenue was approved in 1923.

Shops and Buildings

Georgia Railway & Power Company, Atlanta, Ga., is now constructing a three-unit brick and steel garage, at an estimated cost of $110,000. The new structure, known as the Gilmer Street garage, will consist of a main building 115x250 ft., divided into two sections by a fire wall. Each section will contain approximately 14,000 sq.ft. and can accommodate 35 large coaches when parked parallel to the side of the building, or 45 medium-sized trucks parked at 45 deg. Gasoline and oil service stations, water and air lines and an inspection pit are to be included in the main structure. A 40-ft. square paint shop and a storeroom 24x85 ft. will complete the layout.

Chicago Rapid Transit Company has commenced work on a new $250,000 terminal to be located at Wells and Quincy Streets. It will accommodate a certain portion of the West Side elevated trains and form the Chicago terminal of the Chicago, Aurora & Elgin Railroad. The old station on the same site will be torn down, but train service will be continued during the construction period.

Trade Notes

L. W. Grave, treasurer and general manager of the Cleveland Pneumatic Tool Company, Cleveland, Ohio, announces the merger of his company with the Westinghouse Air Spring Company of New Haven, Conn. The Westinghouse Company was patentee of the first shock absorbing equipment of the air controlled type, and the pneumatic tool concern manufactures and sells the Gruss air spring.

William J. McIntyre has been appointed sales representative for the Chassis Lubricating Company, in the Detroit-Toledo district, with offices at 4-159 General Motors Building.

B. H. Lytle has been appointed manager central sales division of Hyatt Roller Bearing Company, with headquarters at 806 Fulton Building, Pittsburgh, Pa. After being graduated from Carnegie Tech, Mr. Lytle entered the service of the Westinghouse Electric & Manufacturing Company, where he remained until his recent connection with the Hyatt Company. His new position places him in charge of the sales of Hyatt roller bearings for all applications in the central division, except automotive.

Edwin Desuden has joined the sales organization of the National Railway Appliance Company in the capacity of special representative, with headquarters at 452 Lexington Avenue, New York City. Mr. Desuden was for many years sales manager of the Jewett Car Company and later served as manager of the railway department, Chicago Varnish Company.

Root Spring Scraper Company, Kalamazoo, Mich., furnished the scraper equipment for the new Williamsport one-man cars, which were described in the JOURNAL of Jan. 8.

Public Service Transportation Company recently ordered 450 type J Johnson electrically operated automatic fare boxes for buses, which means that the company will soon have 807 buses fully equipped with this apparatus. The type J Johnson fare box registers every fare electrically, instantaneously and audibly, by means of the coin itself which the passenger places in the box. The last order brings the total installation of these boxes in buses and street cars to 2,207.

New Advertising Literature

Alexander Milburn Company is now describing its welding and coupling apparatus in a handy pocket brochure. Among other things the new publication contains price lists on Milburn outfits, regulators, gages, manifolds, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, February 5, 1927 *Number* 6

Rapid Transit Subways an Economic Solution for Street Traffic

CHICAGO'S billion dollar transit plan improves with rereading. The material and theories presented warrant many readings. Besides being a good transportation plan it is a sound economic treatise on civic traffic relief. The abstract of the report presented in the Jan. 22 issue of this paper could but briefly touch the high spots.

Subways are ordinarily considered as a benefit to their patrons. They are. More than that, they are a benefit to the street surface users. One subway will provide transportation facilities for many thousand people who would otherwise use the overcrowded streets. Widening or double-decking of streets might accomplish the same thing, but with attending difficulties of approaches that are much simpler when accomplished by rail transportation. The cost of rapid transit subways is also materially less.

No one would think of burdening the car riders to pay for a double-decked street; more likely the riders or their company would be reimbursed for what costs might be involved in changing the rail structures to conform with the double-decking. Henry A. Blair, author of the plan, likewise argues that the cost of providing tubes for trains should not be added to the street car fare—neither the principal nor the interest on it. For the benefits derived by transit users—and they are important, indeed—the riders will absorb the cost of scrapping the superseded surface track investment and the construction of the new and costly track structures in the tubes. The company will provide capital for the track and equipment and the riders will pay for the operation of the trains and the use of the private investment.

Mr. Blair's arguments are materially strengthened in this position, since Chicago has already spent millions in providing more street surface for vehicles, at materially greater unit costs. Wacker Drive, for instance, cost $20,000,000 per mile and Michigan Boulevard $18,000,000 per linear mile of street gained. Subways are only another way of accomplishing the same thing, except for the important difference that they are materially cheaper. Also, as shown in the McClintock report on street traffic, they will serve more of the populace because 62 per cent of the people who enter the central district use the common carrier vehicles (except steam roads) and only 19 per cent private automobiles. The auto is more in evidence because of the great number of units, but the service it performs for individuals is quite another story. After all, it is the individual who must be benefited, not the vehicle.

Subway proponents should not be blinded to certain obvious disadvantages, both to the public and the operator. Many short-haul riders in the subway areas will unquestionably be lost. People cannot be induced to go down one or two flights of stairs to a car or train they know must be there but cannot see as they can on the street, only to ride a few blocks and then climb to the surface again. This is a loss the transportation system must bear as a part of the civic improvement and the benefit derived by the long haul and less profitable passengers.

With this thinking, subways as public improvements appear in a different light from that often observed. It is not a question of company welfare, because the users must pay in the end, but one of economics—a fair distribution of costs for the benefits derived.

Hesitating Before the Plunge

IN ALL sections of the country electric railways are repainting or refitting or rebuilding some of their equipment. Unfortunately, in many instances unwise things are being done. Expenditures ranging from $1,000 to $7,000 or $8,000 per car are being made to improve old equipment. With many of the oldest cars, although new paint and new seats and other improvements help materially, the rehabilitated cars are still heavy, clumsy and noisy affairs that fool nobody but those who lacked the wisdom and the courage to get rid of them. These are strong words, but they represent the judgment of a rapidly widening circle of forward looking operators who have given the subject careful thought, and who have made an unbiased analysis of the experience of those properties which have put on modern cars.

New cars are not a panacea. It has been said before that they will not take the place of good management. But they are a part of good management. They make many things possible that are impossible with heavy, clumsy, noisy and run-down equipment. It is easier to make a friend of the man on the sidewalk for the railway which presents the appearance of being progressive and up to date. It is easier to secure the co-operation and interest of employees on spick-and-span, modern cars which make them proud of their jobs than on dilapidated arks that sway and toss and groan and creak. Since the first step toward winning public friendship is to get the public interested in the railway, modern new cars help toward the solution of some of the industry's most pressing and baffling problems.

The general tendency to rebuild old equipment is a favorable sign. It is an indication of the rapidly growing and spreading realization of the need for improving the appearance, comfort and performance of electric railway cars. But in a sense the present situation is like that of the timid swimmer who cautiously tests the water before plunging in. The industry is interested, but it is still timid. There are many years of precedent to be overcome. It takes a high degree of courage and faith to send good money after bad unless there is a preponderance of evidence in support of such action. A new kind of thinking is being advanced. Somehow it is difficult for the average electric railway man to abandon the idea that a street car should be able to run forever. "It is a perfectly good car," he says. "Maybe it is a little bit heavy, but a coat of paint and some new seats will fix it up good enough to run many more years. These cars are too good to throw away." And so he paints and patches his twenty-year-old cars and then goes home to buy his wife a new automobile to replace the one he purchased three years before.

But the industry is thinking. It is beginning to ask itself pointed questions. It is beginning to realize that times are changed and that we have changed with them. It is standing on the brink of a new idea, but, like the timid swimmer who cautiously tests the water, it still hesitates. A little more testing is required; a little more experience on the part of those properties that have definitely gone ahead. Then we may expect to see the industry courageously striking out to put its equipment into shape to meet the need of modern times and modern demands.

Rule of Thumb Methods Will Not Solve Traffic Problem

CONTROL of street traffic by an extensive system of interconnected signal lights, all giving the same indication at the same instant, has proved extremely inefficient. This is because of the dissimilarity of conditions at different street intersections, where the volume of cross traffic varies greatly. With such a system the time intervals must necessarily be based on the needs of one particular intersection, so that they are entirely unsuited to the needs of other intersections having different characteristics. It is evident, therefore, that no such simple and easy plan will solve the problem of traffic control.

In New York City the Police Commissioner recently asked for $534,000 to install 800 additional traffic signals, following the same general plan that is now in use on Fifth Avenue and other longitudinal streets. It is proposed to synchronize vehicular movement over considerable distances on many parallel thoroughfares. Like some well-advertised patent medicines, these signals are expected by the municipal authorities to have a variety of beneficial effects, such as speeding up the vehicular movement, preventing accidents and reducing the number of traffic police required.

Curiously enough, one reason cited for extending the system is the tendency of automobile drivers to avoid the streets equipped with synchronized signals. Perhaps this is because the lights have speeded up vehicle movement until careful drivers are afraid to travel on these thoroughfares. One is inclined to doubt this explanation when it is remembered that the average speed of vehicles on Fifth Avenue, New York, excluding buses, is only 7 m.p.h., despite the use of the lights. In fact, engineering investigation indicates that synchronized signals have a definite tendency to slow down traffic.

So far as safety is concerned, the National Safety Council finds that simultaneous control offers no advantage over any other type of control. Thus reduction in the number of traffic police remains as the only desirable result achieved. If that be the object, it should be so stated, and the installation should not be made to masquerade as a means of speeding up traffic.

On the other hand, the "progressive" or "co-ordinated" plan, whereby the signal lights change according to the requirements of traffic at the particular intersection, rather than all changing simultaneously, has proved to be extremely efficacious in speeding up traffic. The installation on State Street, Chicago, is an outstanding example of the successful application of this principle. The speed of vehicular movement has been increased more than 25 per cent since this system has been in use. Rather than spend huge sums to provide more lights of a simultaneous type, New York and other cities contemplating similar installations would do well to study the methods used elsewhere, and profit by experience already obtained.

A Humanitarian Movement That Pays Large Dividends

FEW are the accomplishments in the street railway industry that can be of more benefit than a reduction in the number and seriousness of accidents. On any property it will result in better service because of lessened delays, in more economical operation because more of the gross revenue is retained as net and, last but not least, a reduction in the amount of human suffering.

Accident prevention, then, must be looked at as one of the most desirable ways of improving the operation of a system. Every company should be interested in the subject, and should do its share in finding ways of minimizing losses of this character. The Claims Association and the Transportation & Traffic Association are both doing excellent work in studying the prevention of accidents rather than in minimizing the loss after one has occurred.

The efforts of these associations are in large measure confined to the industry. Work of a similar character, but on a scale to interest the whole nation, is being carried on by the Electric Railway Section of the National Safety Council. The effectiveness of this work depends in large measure on the size and quality of the membership and the interest taken by the individual representatives. The last convention of the council showed that interest is not in any sense lacking. The subjects were live and the discussions were good.

The membership, on the other hand, is not nearly so large as the importance of the subject justifies. Statistics show that only 128 electric railway companies, or about one-sixth of the total number of active operating companies, have membership in this body.

In view of the vital character of the council and the wonderful possibilities in getting the results that are to be obtained, every company should see if it can afford not to be connected with this movement.

A Lot of Shucking, but Mighty Little Gain

"DYAR'S er monst'us mess o' shucking, but er mighty little grain," the quaint philosophic refrain to a negro dialect poem, is pertinent to the present transit problem now before the citizens of Greater New York. In the light of the predatory shucking operations of a certain political group at Albany, it seems safe to predict that if there is any grain it will be in the nature of corns on the feet of millions of citizens now called upon to put up with inadequate and insufferable transportation conditions.

Perhaps the most alarming phase of the problem at present is that of the public paying too much attention to the bus franchise controversy between Mayor Walker and the Board of Estimate and, as a result, neglecting the main issue, an issue so fundamental that it makes New York's problem a national one. Unbiased experts see no cause for alarm in delaying the franchise awards. Such action will undoubtedly result in good for the traveling public in the matter of safety, adequate seating facilities, lower fares and, more than likely, greater revenue to the city.

They are, however, deeply concerned that the people should neglect the solution of the main issue—more subways—which is threatened with annihilation in the present Legislature by the refusal of a political group to allow the people a voice in the extension of the city's debt limit. By so doing it is patent that a minority can rule, that it can destroy a rock-ribbed political axiom of the republic. In other words, it can shuck for the silk and not the grain. This brings one back to the assertion that New York's problem is a national one, for its roots are in the inertia of the people at the time of expressing their will, *per se*, when the polls are open. The people are, have been and always will be the reformers of the world, and as they sow so shall they reap. If they refuse to vote, or, what is far worse, vote unintelligently and under the spellbinding influence of selfish political promises, they must be prepared to be twiddled around the thumbs of petty politicians.

Talking Trainmen Can Do Railway Much Harm

WOMEN as a sex are usually credited with doing harm by too much talking, but men also are frequent offenders—particularly those railway employees who come into most frequent contact with the public—the trainmen. Sometimes it is just a slight grudge the man has against the company that causes him to grumble in the presence of passengers. In other cases it may be nothing more than natural garrulousness. But no matter what the reason, it always creates a bad impression when an employee tells the world what he believes to be wrong with the company and how much better things would be managed if only he had his way.

Seldom is the management in ignorance of this habit of certain employees to talk too much. Before long it is bound to reach the ears of those in authority. It is not easy, however, to know just how to handle such cases.

No management is perfect, and an experienced and thoughtful employee often is able to see ways in which service can be improved. If he is encouraged to impart his ideas to his superiors, he will be less inclined to unload them on the public. When the adoption of a suggestion is impracticable, the reason should be carefully explained to the man. Should he continue to feel seriously at odds with the policy of the company, his only proper course is to leave its employ. It is indefensible for a man to remain on a payroll who criticises company methods at every opportunity.

Undoubtedly the best way to forestall such talk is to give employees full information about the affairs of the company. The old conception that the relations of employer and employee were those of master and servant has largely passed away. Progressive railway managements have come to regard their employees as copartners in a joint enterprise. As such they have a real interest in the company's affairs and deserve to be given all possible information about its operation. Where this policy has been adopted, as in the case of the Pittsburgh Railways, for example, it is meeting with conspicuous success.

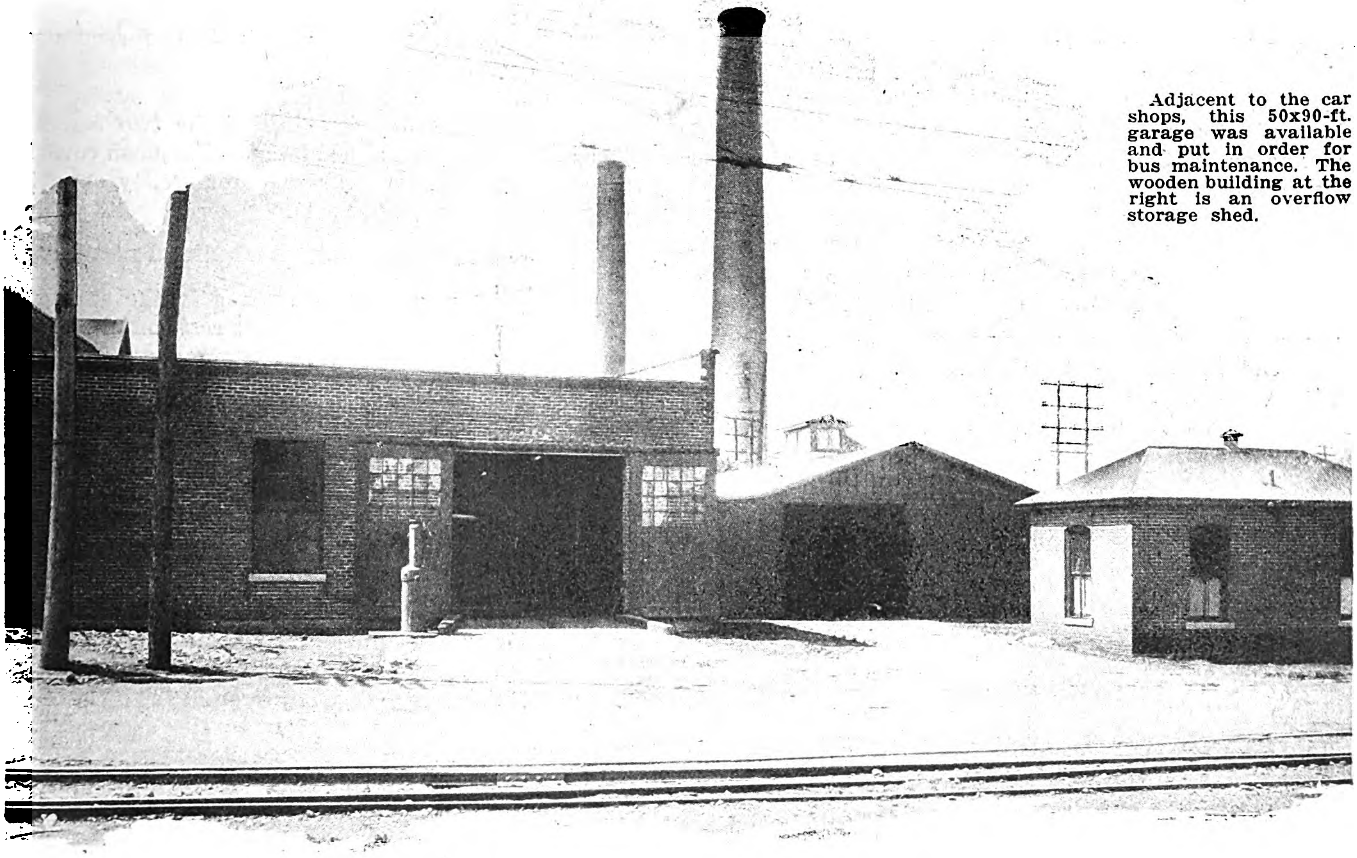
Surely This Kind of Death Is Not a Necessary Evil

"THERE is no class of taxpayers in New York State so heavily burdened by taxation as the street railways." Had an electric railway man said that it would have been regarded as vicious propaganda. A railway man did not say it, but the last man in the world who would be expected to do so. That man is none other than John J. Merrill, the tax gatherer himself. He is supposed to be impersonal in his point of view, and he is. But his alacrity in office as a member of the New York Tax Commission to gather the uttermost farthing has not blinded him to the inequity of a system that takes away from the electric railways $2,500,000 in taxes as paving. That in itself is an anachronism. As Mr. Merrill pointed out in a public speech, street railways pay a property tax on all property, 1 cent on every dollar of gross income, and in addition to all that a franchise tax.

The recital is particularly interesting because of the source of the remarks. Perhaps even more important is the picture which Mr. Merrill has drawn of the taxes paid by some others toward the support of state government.

The question is ever recurring. "Taxing the Utility" as discussed by Prof. E. R. A. Seligman before the committee on taxation of the American Electric Railway Association was the subject of an article in the JOURNAL for Jan. 29. Professor Seligman's talk was, of course, more specific than was Mr. Merrill's, but it had a different object. Professor Seligman made a plea that the utilities get behind the gross-net tax and do away with all the absurd things in the laws today, including the special franchise tax. In his opinion, if the utilities did this, and approach the subject fairly and loyally they would be able to help solve both the state and the local tax problem and at the same time achieve something that will ultimately redound not only to their own benefit but to the prosperity of the community as a whole. Talking to different audiences, the methods of approach to the subject by these two men had to differ. Professor Seligman does not lack the power to present facts concisely, but it fell to Mr. Merrill's lot to galvanize the facts into life. No one will deny that he did that.

There are apparently no limitations on the use to which the electric railways may put the facts Mr. Merrill and Mr. Seligman have so concisely stated for them. They have given the railways most valuable ammunition. This paper is glad to print the remarks and call the attention of the industry to them. While it is decidedly unpleasant to the electric railways to be reminded by Mr. Merrill that "electric railroads are being taxed to death," particularly when these remarks are so close an approximation of the truth, the legitimate use that the industry makes of these statements in its own behalf will bespeak the extent of its courage to battle for the right for itself and, more important still, for its own patrons. One may still agree with Shakespeare's sentiment that death, a necessary evil, will come when it will come, but death by external strangulation is hardly a necessary evil, supinely to be endured.



Adjacent to the car shops, this 50x90-ft. garage was available and put in order for bus maintenance. The wooden building at the right is an overflow storage shed.

The Five Fundamentals of Co-ordination

Lexington, Ky., Property Evolves Working Definition—Encouraging Growth in Trolley Riding Even During Periods When Number of Buses Is Greatly Increased

By R. E. Plimpton
Associate Editor Bus Transportation

"WHAT is co-ordination?" is a question that is being given a practical answer in the city of Lexington, Ky. With less than 50,000 all-year inhabitants, this center of the breeding of blooded stock for horse racing, of the largest burley tobacco warehouses in the world and of at least half a dozen institutions of higher learning has kept up an encouraging growth in trolley riding and revenue. At the same time there is being developed a bus system which while not yet profitable in itself gives every promise of being so as operating experience is gained and practicable buying economies are put into effect.

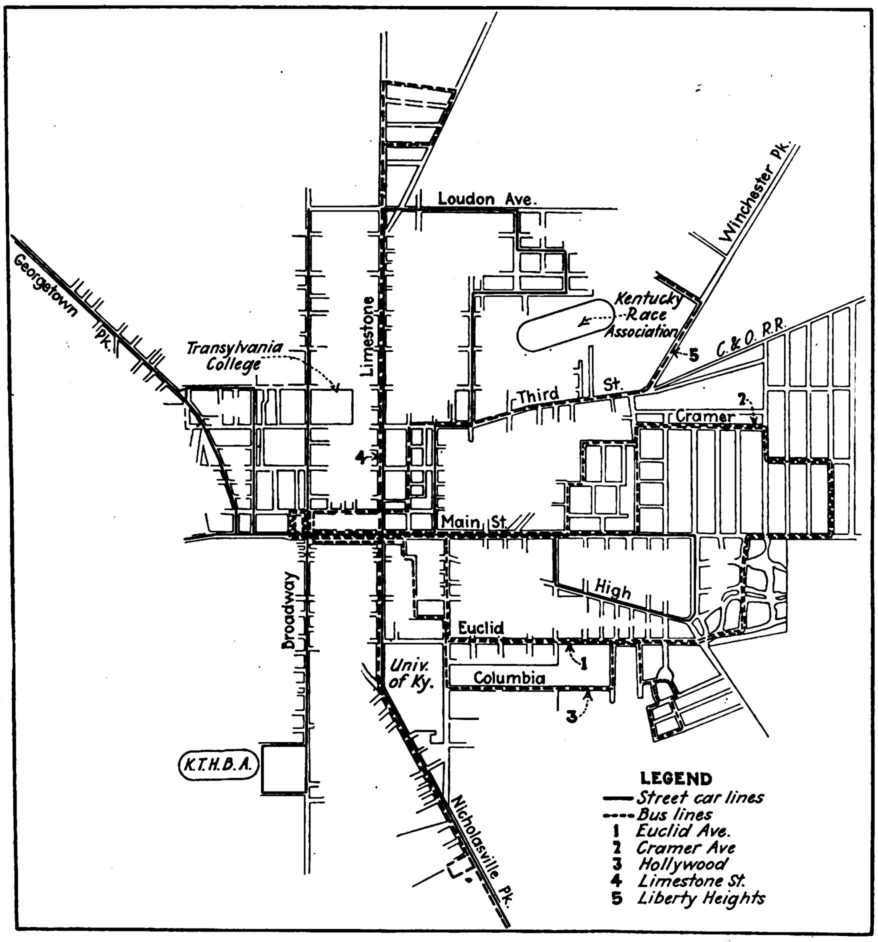
The Kentucky Traction & Terminal Company and its subsidiary, the Kentucky Coach Company, are now in a position to say that co-ordinated transportation is a fact in the city of Lexington. To secure the present non-competitive operation in local transportation a long process of education has been necessary, but at present the people of the city and its government seem to be convinced that better service can be given under the one management. It is felt also that the traction company has done the fair thing in buying out certain of the small operators who had previously made a hand-to-mouth living, often on routes directly paralleling the trolley line.

With these underlying problems settled, for the time being at least, the company has gone ahead really to practice co-ordination based on the following five fundamentals:

1. *Organization* — A subsidiary company operates buses on account of certain legal requirements, the bus work being taken over largely by the trolley staff.
2. *Routes.*—The new bus lines dovetail to supply unserved territory, with the exception of one case where parallel routes are necessitated by special conditions.
3. *Schedules.*—Service alternated in the one instance of parallel routes with "loop" layouts adopted for other bus lines. On two of these lines service given on the loop in both directions.
4. *Facilities.*—New garage building put up adjoining trolley car repair shop. Machine tools, blacksmith, woodworking and painting facilities of car shop used for bus work.
5. *Equipment.*—Experimental work to adapt practice in trolley construction to the motor bus and incidentally to develop worth-while automotive ideas in connection with trolley car construction.

NEW DUTIES, OLD ORGANIZATION

The Kentucky Coach Company, formed early in 1925 when bus operation was started, is a subsidiary of the International Utilities Corporation, the holding company, which also owns and controls the Kentucky Traction & Terminal Company, the Lexington Utilities Company, operating the electric light and power interests in Lexington and the surrounding territory, and the Lexington Ice Company, operating two ice and one cold storage plants in Lexington. Officers are practically the same for the four companies, with J. P. Pope vice-president and general manager of each local company. It was a simple matter for the various administrative and operating departments to take over the new bus work. The superintendent of transportation, H. Bush, has direct charge of bus and railway operation, being assisted by one timekeeper and starter, one road supervisor and one inspector. Each of these officials gives the same attention to both forms of transportation, supplying change for all bus and car operators, putting equipment out on time, instructing operators and riding on the vehicles periodically. In like manner, the motor truck operation of the company furnished the nucleus of mechanical talent, which has been placed under the superintendent of equipment, W. G. Stuck, with a master mechanic as assistant in direct charge of trolley and bus maintenance. One working bus foreman was added this year, when the fleet was practically quadrupled in size by the purchase of new buses. The same force handles the cleaning of the two forms of vehicles, this being simplified because the plush covering for seats, standardized years ago for trolley cars, has been adopted for the bus seats.



Practically Every Section of Lexington, Ky., Is Served by the Two Forms of Transportation Operated by the Kentucky Traction & Terminal Company and by Its Subsidiary, the Kentucky Coach Company

ALL BUS ROUTES BUT ONE SERVE NEW TERRITORY

The Euclid-Cramer routes, started in the spring of 1925, pass through one of the finest residential sections of Lexington. While these are shown on the map as one route, buses are operated around the loop in both directions. On the "loop" part the streets followed are a considerable distance from any trolley line, thus serving a territory that entirely lacked public transportation. The Hollywood route, started in January last year, also keeps clear of any trolley line. This is not the case with the service on Limestone Street, an important through artery, where bus and trolley run parallel except for the diverging loops shown near the northeastern border of the city. On this street bus service has been given previously by a small number of independent operators, and for policy reasons and as a contribution to public relations it was deemed best to continue the two forms of transportation.

Approximately seventeen-hour service is given on both bus and trolley. In general the basis is a fifteen-minute service, with a ten-minute service on the peaks. Lexington is a "home to luncheon" city, so that there is a noon as well as morning and evening rush period. Frequent service, so desirable in the smaller cities where competition is often with would-be walkers, is obtained on Limestone Street by alternating bus and trolley. The bus headway is shown in the accompanying table, but on account of the method of operation on Limestone Street the public gets a six-minute service during off-peak and a five-minute service during peak periods.

Similarly, the Euclid and Cramer lines are staggered so that the headway out of the downtown terminal is 7½ minutes during the off-peak period and five minutes during peak periods, with the same headway at the far end of the loop. As is indicated in the table, on all lines ten buses are required for base service and fourteen for the peak requirements.

To house the buses a 50x90-ft. garage which happened

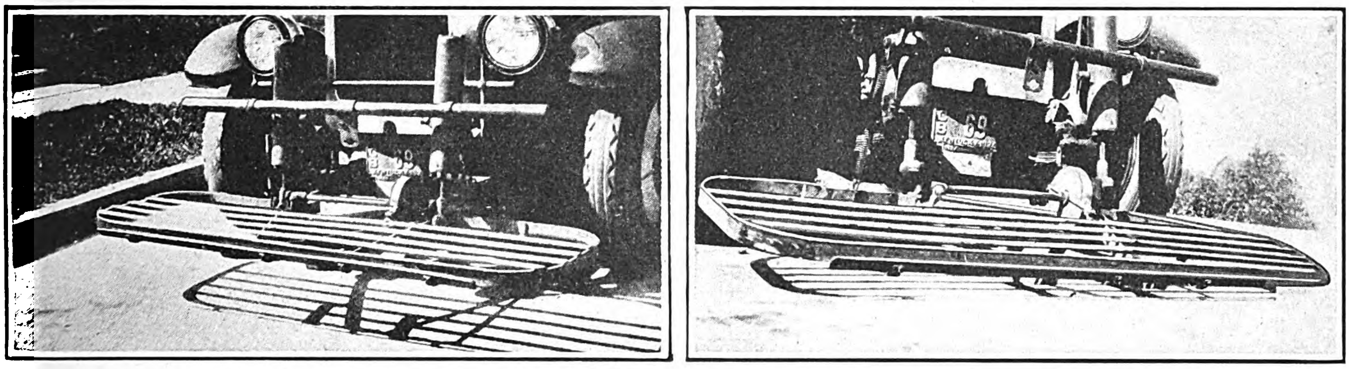
CO-ORDINATED BUS ROUTES, LEXINGTON, KY.

Route		Date Started	Round Trip, Miles	Round Trip Running Time, Minutes	Lay over, Minutes	Headway, Minutes		Buses Operated	
No.	Name					Base	Peak	Base	Peak
1	Euclid	4-6-25	5.2	27	3	15	10	2	3
2	Cramer	4-6-25	5.2	27	3	15	10	2	3
3	Hollywood	1-11-26	5.2	27	3	15	10	2	3
4	Limestone	9-1-26	6.9	38	2	12	10	3	4
5	Liberty Heights	9-18-26	4.2	25	5	30	30	1	1

to be available across the street from the trolley carhouse was bought. This was remodeled last year with installation of large doors, skylights and a drainage system, about $6,000 being spent to put it in good working order. Following the purchase of new equipment last year a small frame structure, which is shown in an accompanying illustration at the right of the main garage, is also being used for storage. Heavy repair equipment already available in the trolley shops is, of course, utilized to the fullest extent. All the machinist work is done in the car shops, where blacksmithing and welding facilities are available. Air from the railway air compressor supplies the garage, and body repairs and repainting are taken care of by the same force and with the same facilities. One of the illustrations shows the paint shop with a one-man trolley car and a 24-passenger bus side by side.

ROLLING STOCK

In introducing the new bus equipment many of the details of construction found satisfactory with the trolley have been adopted. For example, all the seats are finished in plush, a material which has proved extremely satisfactory for the local conditions after many years use in city and interurban electric cars. Another novel feature is shown in an accompanying illustration. This is the use of a front fender on buses. It is the invention of F. W. Bacon, president of the Kentucky Coach Company and vice-president of the Kentucky Traction & Terminal Company. The fender is arranged so that it is tripped automatically when it strikes an object or the driver can drop it or lift it up by a knob placed at the side of the steering wheel.



Fenders Are Used on the Lexington Buses, Being Controlled by the Driver. The Views Show the Fender in the Up and Down Positions

The idea of co-ordination is carried out in the fare arrangement, the rate being 7 cents cash, four checks for 25 cents, on either car or bus. A universal transfer system from car to bus and vice versa is in effect. At present about 66 per cent of the passengers on the buses use the checks, as against 57 per cent on the trolleys. This difference is due, it is said, to the fact that whites only are carried on the buses, while the trolleys carry colored people as well as whites.

On this fare basis the business has grown until the buses are carrying around 140,000 passengers a month, as compared with 400,000 on the trolleys. Income from buses during 1926 will be about $110,000, it is estimated, while the trolleys will bring in nearly $250,000. Annual mileage covered during 1926 was about 657,000 for the buses and 1,050,000 for the trolleys. Route mileage is 11.3 and 18.6 for the two respectively, these figures being based on half the round trip mileage, which includes the distance covered on the loops. The bus equipment includes a total of 444 seats, as compared with a total of 812 on the trolleys, the latter representing 29 one-man cars, each seating 28 passengers. Five makes of buses are used, five 24-passenger Whites, eleven 21-passenger Yellows, five 15-passenger Reos, and one 17-passenger Graham.

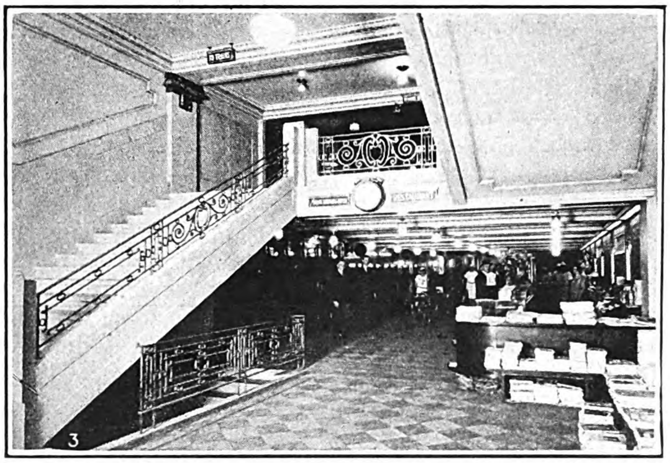
At present the bus growth is greater than on the trolleys, a recent month showing a 40 per cent increase in riding, as compared with the same month last year, while the trolley riding went up only 10 per cent. This is accounted for by the addition of a number of buses in April of last year. In fact, the number operated has been practically doubled over a year's time. In view of this the trolley showing is very encouraging.

Taking the figures for the last six months of 1926, the traffic was about 175 rides per inhabitant, not at all a bad showing for a city roughly 3 miles and 4 miles across on its main axes. Of these 175 rides per inhabitant, about 60 were taken in the buses. For the first six months of 1926 the bus operation showed a total accumulated loss of close to $10,000, although the increase in bus business lessened the loss considerably in the second half of the year. As against this the trolley part of the business is practically breaking even. It is expected, however, that when possible buying economies are put into effect and increased experience is gained in maintenance a much better showing will be made with the buses.

The officers of this company are strong believers in weight reduction and think that the manufacturer should apply a lighter vehicle and therefore one less expensive to operate, without any sacrifice in strength or durability. Another result they are working to obtain is the transportation point of view among their automotive maintenance force. It has been found that the average automotive mechanic is more efficient in replacing parts than in locating and eliminating trouble. Hence, the effort is being made to imbue these men with a new conception of the purpose of inspection.

Capacity of Traffic Lanes

SPEAKING at a meeting of the American Society of Civil Engineers on Jan. 5, Arthur Tuttle, engineer of the Board of Estimate, said that on the proposed marginal highway in New York City there would be six lines of vehicles and that each line would have a capacity of about 1,500 vehicles per hour. He added that there was no street in New York at the present time in which the maximum number of vehicles moving past a given point reached as many as 900 per hour per lane.



An Excellent Restaurant and Lunch Counter Run by the North Shore Line Is Located in the Rear of the Street Floor of the New Station

Looking Toward the Front on the Street Floor of the North Shore Station. Finish Is in Marble and Walnut with Brass Fixtures and Fittings Inclosing the Ticket Office

North Shore Opens New Station

Interurban Line Between Chicago and Milwaukee Has a New Station in the Chicago Loop, Reported to Be the Finest of Its Kind—Serves Trains Operated Over Elevated Tracks and Companies' Bus Operations

SUPERIOR accommodations are afforded to patrons by a new station of the Chicago, North Shore & Milwaukee Railroad in the Chicago Loop district which embodies decorative features that make it one of the finest interurban stations of its kind. It is located at 223 South Wabash Avenue, only a few doors south of the location of the former station.

Passengers enter and leave the main floor directly from the street. Ticket offices, check room and restaurant are on this floor. The interior finish is marble and walnut with brass fixtures, presenting a most pleasing ensemble. Broad stairways lead to the upper or train level and to the men's smoking room in the basement.

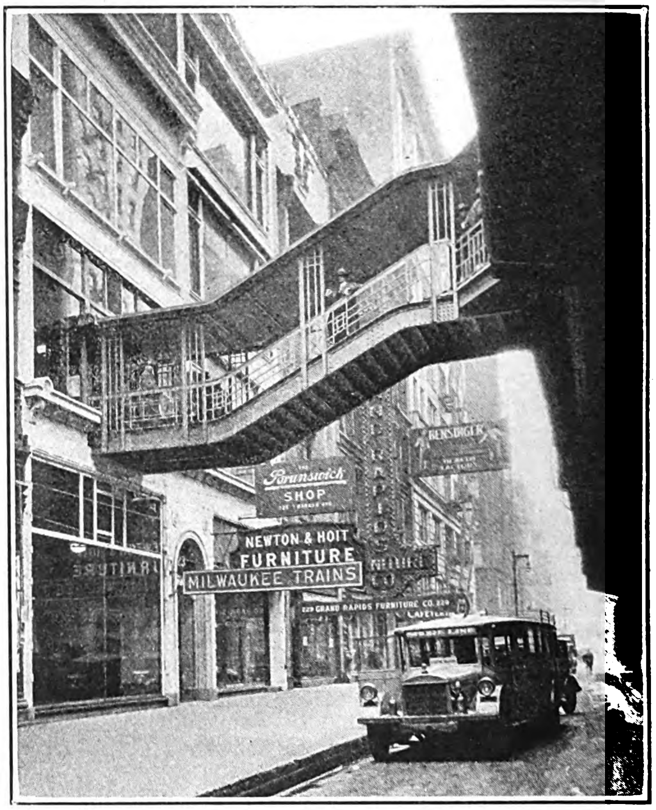
The second floor is given over in part to a waiting room. A bridge connects this with the Adams and Wabash "L" station, where patrons board the North Shore trains for Milwaukee and intermediate points. For convenience, additional ticket windows are provided. At the rear of this floor are show windows in which are attractive displays of household furnishings.

Walnut benches are provided on both floors for passengers waiting for trains. In addition, a women's waiting and rest room is equipped with luxurious period furniture.

A feature of the new quarters is a system of electric amplifiers through which train departures are announced so that they may be clearly heard in all parts of the station.

A. U. Gerber, architect, designed the new quarters, completely remodeling the old interior. The station has excellent lighting facilities. Illuminated signs direct customers to all points of service.

The restaurant and lunch counter are operated by the North Shore Line, being installed under the direction of P. F. McCall, manager of commissary. The kitchen is equipped with the most modern cooking appliances. The station will serve as a model in future development of North Shore Line terminal facilities.

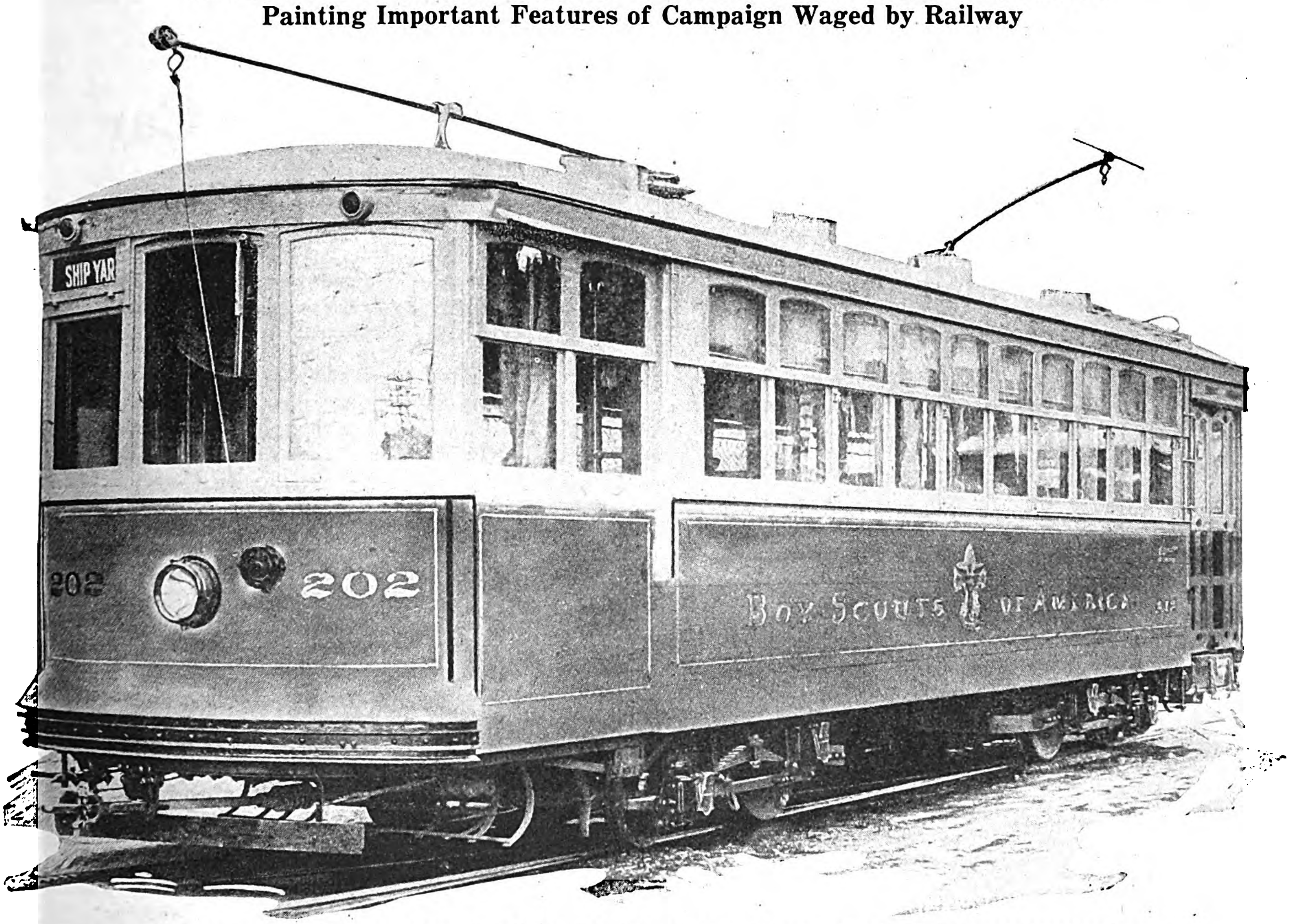


New North Shore Station on Wabash Avenue in Chicago Connects Directly with the Adams and Wabash "L" Station

On the Mezzanine Between the First and Second Floors of the New North Shore Station Is a Sumptuous Lounge Room for the Women Patrons

Saginaw Revives a Dead Service

Once Discredited, the Street Car, as a Means of Local Transportation, Has Come Back with a Punch in the Michigan City—Intensive Advertising and Distinctive Painting Important Features of Campaign Waged by Railway



Distinctive Color Schemes Were Combined with the Naming of Cars for Various Local Organizations in Cultivating Public Approval of the Street Car Service

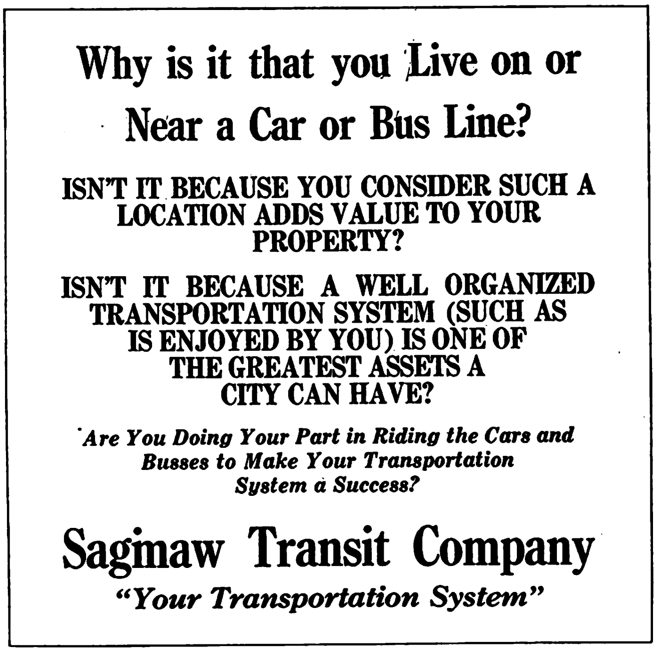
WILL the average rider take a personal interest or pride in the transportation facilities of his city? Will he respond to an appeal for his patronage? Does he actually realize what transportation convenience means to him from a dollar and cents point of view?

The foregoing questions sum up briefly what Charles S. Kressler, president and general manager of the Saginaw Transit Company, Saginaw, Mich., had in mind just before he inaugurated the present scheme of merchandising his electric railway and bus service.

Slowly but surely the progressive policies instituted as a result of these rider psychology questions brought results that proved beyond doubt that a dead service can be revived despite the worst obstacles. In the first place, it was necessary to rekindle interest in street car riding after a lapse of time during which motor buses had completely dominated and then lost public favor through disorganized service. This situation had created the habit of private automobile use for business purposes as well as a public willingness to give free rides to those who desired them.

Secondly, it was necessary to drive out of the average rider's mind the impression that public traction service was monotonous and impersonal in comparison to the freedom of a private automobile. These features typified the most important sales resistance offered to the street railway property. Its service was of a sound nature, and yet it was thought that the public fancy could not be intrigued by this alone, but through some other merchandising method that would keep the subject of transportation favorably impressed in the minds of the riders and lead to their steady patronage. For this merchandising campaign was enlisted the printed word carried in company advertising placed in a leading newspaper and several other mediums reaching different classes of riders. The message conveyed in each piece of advertising copy brought home forcefully facts of which the average rider was perhaps not cognizant and, in addition, convinced him of the value of the service given.

In a number of the advertisements the theme of the message was designed to prove to the rider that private automobile operation was far more expensive to him than the moderate fare charged on either the street car or the bus. How potent this educational work alone proved is illustrated by the decrease of at least 50



Why is it that you Live on or Near a Car or Bus Line?

ISN'T IT BECAUSE YOU CONSIDER SUCH A LOCATION ADDS VALUE TO YOUR PROPERTY?

ISN'T IT BECAUSE A WELL ORGANIZED TRANSPORTATION SYSTEM (SUCH AS IS ENJOYED BY YOU) IS ONE OF THE GREATEST ASSETS A CITY CAN HAVE?

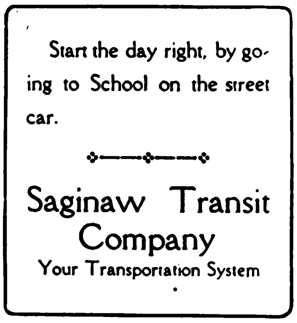
Are You Doing Your Part in Riding the Cars and Busses to Make Your Transportation System a Success?

Saginaw Transit Company

"Your Transportation System"

One of the Typical Sales Appeals Made Through the Advertising Columns of a Newspaper

per cent in the number of parked automobiles at one factory. Formerly this factory yard was overflowing with cars.



Start the day right, by going to School on the street car.

Saginaw Transit Company

Your Transportation System

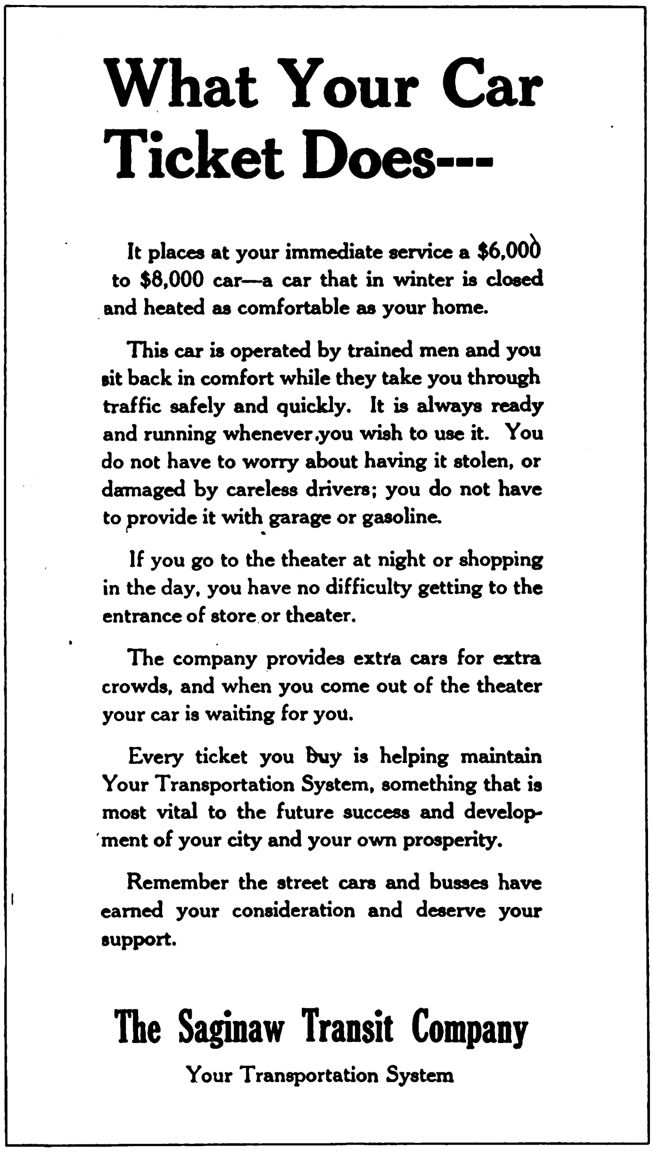
The Importance of School Patronage Was Recognized by Space Taken in the High School Publications

For a long time after the street car system was revived the revenue from school children was considerably below the potential possibilities. The habit of begging rides continued and served as a bad example to other classes of riders, such as those going to the trade school and the naval reserve training station. Through steady advertising in the high school paper and by painting one of the cars in the distinctive yellow and black school colors school revenue picked up immediately.

The same distinctive color plan was worked out on cars covering the trade school and naval reserve routes. These appeals to rider pride were soon developed to encompass the Boy Scouts, Girl Scouts, the American Legion and the 32d Division.

The plan has also been adopted of identifying the car operator through the use of a nameplate prominently displayed in the front vestibule. In abolishing number identification the company feels that it has made just one more stride toward implanting the necessary personal touch in its service. In this case the riders soon acquire the habit of greeting the operator by name when boarding the car in the morning or evening and subconsciously connect the service given them with an individual rather than with a cold, inanimate public carrier.

In September, 1925, the company decided on a fare increase from four rides for 25 cents to three for the same price. In order to determine what the riding public thought of the plan, a general vote was taken. A majority of 60 per cent decided in favor of it. The decrease in revenue immediately after the fare increase became effective was small and soon afterward the increase in gross receipts crept up to a little above 20 per cent.



What Your Car Ticket Does---

It places at your immediate service a $6,000 to $8,000 car—a car that in winter is closed and heated as comfortable as your home.

This car is operated by trained men and you sit back in comfort while they take you through traffic safely and quickly. It is always ready and running whenever you wish to use it. You do not have to worry about having it stolen, or damaged by careless drivers; you do not have to provide it with garage or gasoline.

If you go to the theater at night or shopping in the day, you have no difficulty getting to the entrance of store or theater.

The company provides extra cars for extra crowds, and when you come out of the theater your car is waiting for you.

Every ticket you buy is helping maintain Your Transportation System, something that is most vital to the future success and development of your city and your own prosperity.

Remember the street cars and busses have earned your consideration and deserve your support.

The Saginaw Transit Company

Your Transportation System

Good Public Relations Established by Presenting Salient Facts to the Public Concerning Transportation

Whether the foregoing increase resulted because of the color plan cannot be accurately determined, but it apparently did play an important part, as this plan was started in October, a month after the fare increase went into effect. What the company has accomplished since 1923, when it started operating, until January, 1926, is shown by the traffic statistics. In December, 1923, 14,273 passengers were carried; December, 1924, 20,309 passengers; December, 1925, 23,938 passengers, and in January, 1926, 26,000.

Trainmen's Timekeeping Simplified in Twin Cities

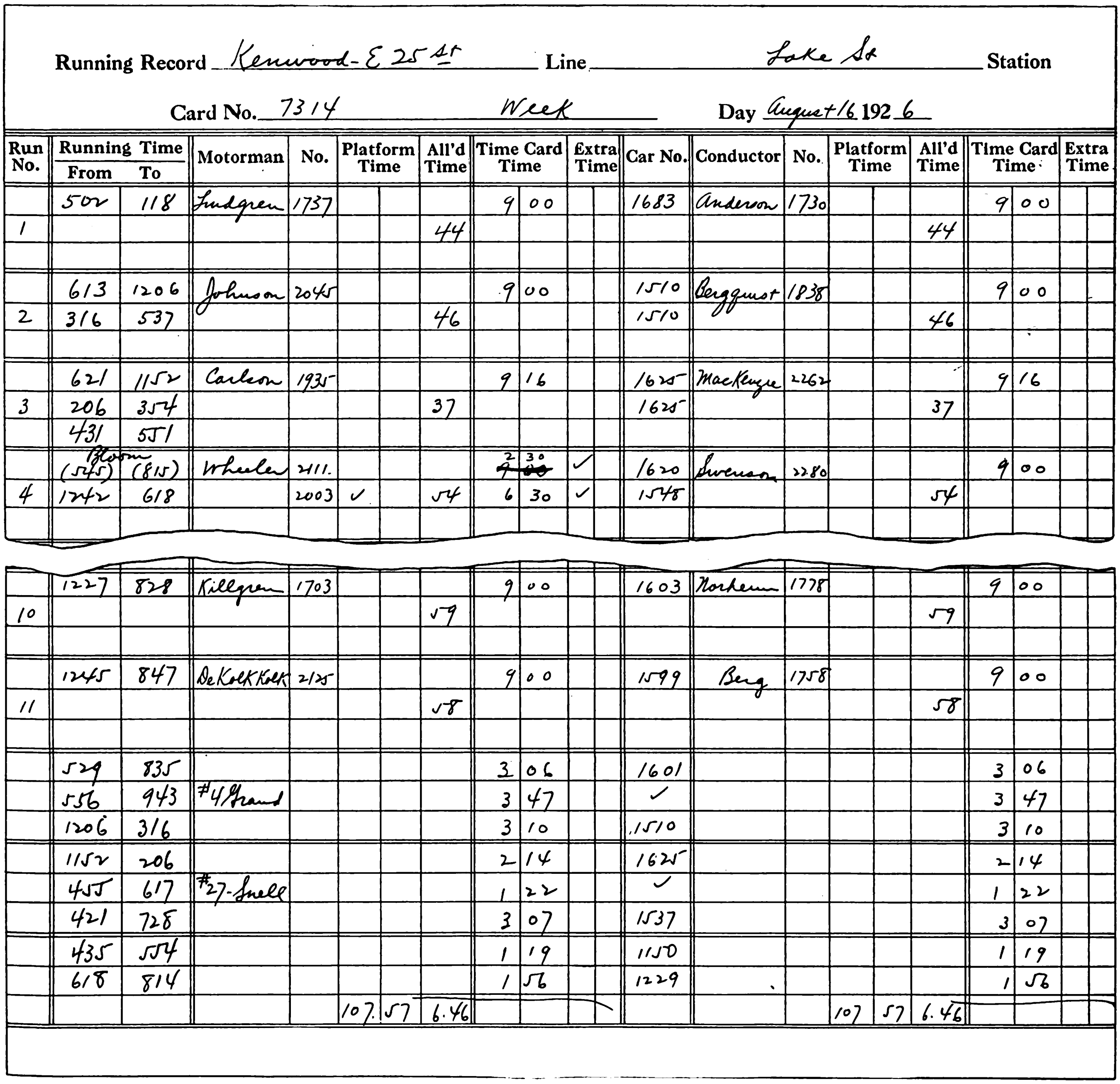
Half of the Time Clerks Saved—Time and Payroll Based on Schedules and Variations Noted to Get Final Figures

PREVIOUS to the change made recently in the auditing department of the Twin City Rapid Transit Company it required twelve clerks to keep the trainmen's time and make up the payroll. With the old method a clerk was required in each car station to make up a time sheet each day from the trip sheets turned in by the conductors, which also included the motormen's time. These time sheets from the six operating car stations were sent in daily and it required six women clerks to post the time, check it with the schedule and to transfer each day's total to the payroll sheet.

Upon studying the actual procedure in this work, it was found that 90 to 95 per cent of the daily work performed was exactly according to schedule and that the only variations occasioned by sickness, allowed time off, traffic tie-ups or other unusual procedures amounted to but 5 or 10 per cent of the total entries necessary.

PAYROLLS MADE UP IN ADVANCE

In accordance with the new plan now in effect on the system the daily time sheet is written once with duplicator ink and fifteen or sixteen copies made, sufficient for the two weeks payroll period. One of the sheets reproduced herewith is for the Kenwood-East 25th Street line, operating out of the Lake Street station. There are eleven runs and eight trippers.



Running Record Kenwood-E 25 St Line Lake St Station

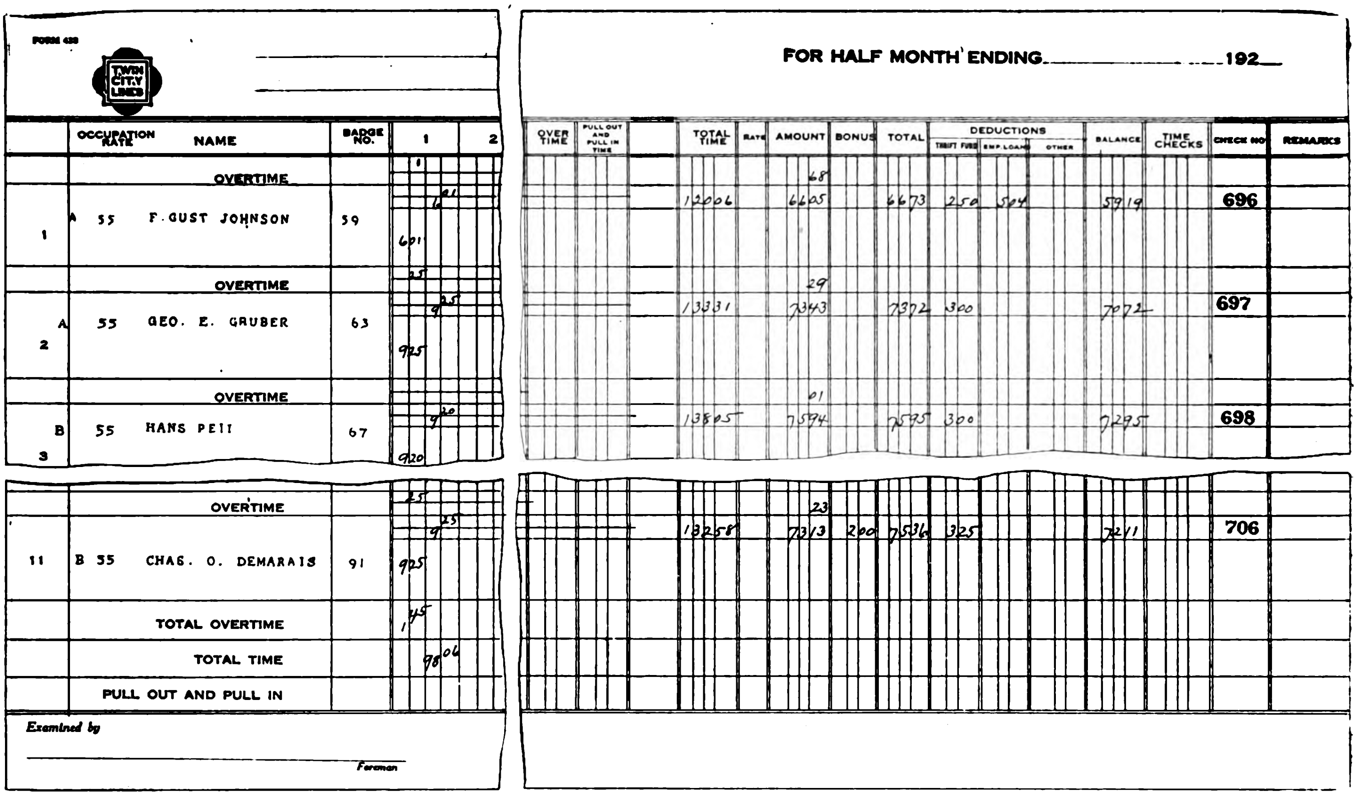
Card No. 7314 Week Day August 16 1926

Run No.	Running Time		Motorman	No.	Platform Time		All'd Time	Time Card Time		Extra Time		Car No.	Conductor	No.	Platform Time		All'd Time	Time Card Time		Extra Time	
	From	To																			
	502	118	Lundgren	1737				9	00			1683	Anderson	1730				9	00		
1							44										44				
	613	1206	Johnson	2045				9	00			1510	Bergquist	1838				9	00		
2	316	537					46					1510					46				
	621	1152	Carlson	1935				9	16			1625	MacKenzie	2262				9	16		
3	206	354					37					1625					37				
	431	551																			
	Bloom (545)	(815)	Wheeler	2411.				2 ~~9~~	30 ~~00~~	✓		1620	Swenson	2280				9	00		
4	1242	618		2003	✓		54	6	30	✓		1548					54				
	1227	828	Killgren	1703				9	00			1603	Norheim	1778				9	00		
10							59										59				
	1245	847	DeKolk Kolk	2125				9	00			1599	Berg	1758				9	00		
11							58										58				
	529	835						3	06			1601						3	06		
	556	943	#4 Grand					3	47			✓						3	47		
	1206	316						3	10			1510						3	10		
	1152	206						2	14			1625						2	14		
	455	617	#27-Snell					1	22			✓						1	22		
	421	728						3	07			1537						3	07		
	435	554						1	19			1150						1	19		
	618	814						1	56			1229						1	56		
					107	57	6.46								107	57	6.46				

Portion of Daily Time Sheet for a Weekday of One Line in Minneapolis

The normal time for the weekday schedule is calculated in advance and sufficient duplicator copies are made to last for a payroll period. As the trip sheets come in, they are checked against this sheet and variations from the standard time card are noted. Also the car number used in each run is marked on this sheet.

This system has saved half of the time clerks used previously and has been operating successfully for some time in Minneapolis and St. Paul.



FORM 438

TWIN CITY LINES

FOR HALF MONTH ENDING ______________ 192__

	OCCUPATION RATE	NAME	BADGE NO.	1	2	OVER TIME	PULL OUT AND PULL IN TIME	TOTAL TIME	RATE	AMOUNT	BONUS	TOTAL	DEDUCTIONS THRIFT FUND	DEDUCTIONS EMP. LOAN	DEDUCTIONS OTHER	BALANCE	TIME CHECKS	CHECK NO	REMARKS
		OVERTIME		1						68									
1	A 55	F. GUST JOHNSON	59	6 21 601				12006		6605		6673	250	504		5919		696	
		OVERTIME		25						29									
2	A 55	GEO. E. GRUBER	63	9 25 925				13331		7343		7372	300			7072		697	
		OVERTIME								01									
3	B 55	HANS PEII	67	9 20 920				13805		7594		7595	300			7295		698	
		OVERTIME		25						23									
11	B 55	CHAS. O. DEMARAIS	91	9 25 925				13258		7313	200	7536	325			7211		706	
		TOTAL OVERTIME		1 45															
		TOTAL TIME		98 04															
		PULL OUT AND PULL IN																	

Examined by ______________ Foreman

Facsimile of One Sheet of the Minneapolis Trainmen's Payroll, on Which Are Transferred Daily the Actual Time Plus the Allowed Time that Each Trainman Worked the Day Before

Prior to the payroll period, the names and numbers of the trainmen operating this line are entered, as well as the time for each run and the total time of the run with the "time allowance" permitted. The total time allowed by the time card is included at the bottom.

When the trip sheets for a day come in, these are checked against this daily time sheet. If there are any changes the duplicated figure is crossed out and the new figure written above it. Usually there may be one or two changes on each time card. The difference in time is quickly calculated, subtracted or added to the total and the day's time for that line is completed.

The time for each man is then transferred to the semi-monthly payroll. The condensed facsimile of the form used is shown at the top of this page. The method of filling it in is obvious.

By the use of this method no timekeepers are needed at the station. The trip sheets are examined as they are turned in and then bundled up and sent to the auditor's office. Here they are checked against the standard time sheets. Necessary changes are re-entered on the payroll for the half month. Six girls in the auditor's office now do the work which previously required twelve clerks. Besides this, they have time to spare for other work. In fact, it is stated that five girls could do all of this work during eight hours a day. There are at present 2,200 trainmen, but the same force has done the work for 2,500 trainmen.

Some little difficulty is experienced when the lines are thrown off schedule, as, for instance, in case of a heavy snowstorm, but if every line were thrown completely off schedule due to some such cause, the situation for a day or two would be no worse to handle than the normal day on the old basis. Naturally these days of abnormal conditions are very infrequent.

Three different time cards are in effect on the system, weekday, Saturday and Sunday. Sheets similar to those represented are made up for each kind of time card.

Radio Stunt—A Valuable Advertiser

AN UNUSUAL method of using the radio as a valuable advertising medium has been successfully developed by the Northern Texas Traction Company, Fort Worth, Tex. The first program was so refreshing in its novelty that it brought a total of 2,612 "fan letters," a record for station WBAP. The programs are broadcasted semi-monthly from station WBAP of the Fort Worth *Star-Telegram* and *Record-Telegram.*

This popular stunt consists of a round trip between Fort Worth and Dallas on the "Crimson Limited," the non-stop interurban train of the company. A specially constructed noise-making device reproduces all the sounds made by interurban trains in actual operation, such as the conductor's signal bell, warning gong, click of wheels and whistle. With this realistic obbligato the announcer describes the passengers, scenery and incidents of the road with so much enthusiasm that many of the listeners are reported to believe that the program is actually being broadcasted while the train is going over the line. New incidents of the trip are introduced from time to time to give variety to the program.

The advertising advantage of these programs is tremendous and varied. As far as the general public is concerned, the radio not only provides direct contact with the majority of potential patrons but it also offers an opportunity for follow-up advertising in connection with the mass of "bad mail" which is continually coming in. All of these communications are immediately answered by letter, over the signature of the passenger agent, containing a souvenir time-table.

With the radio activities of the company growing popular the company has recently erected its own studio. In addition to the trip on the "Crimson Limited," entertainment is furnished by three orchestras and various vocal artists, many of whom are recruited from the company's own ranks.

Berlin Carries Out Extensive Car Improvement Program

SECOND ARTICLE

Cardan Drive Being Used in Various Combinations and Is Considered Especially Desirable for Trains of Two Motor Cars—For Such Use Two Motors Only Are Required to Drive All the Axles of the Train—Cardan Drive Gearing Shows Practically No Wear After a Run of 58,000 Miles

By Wilhelm Pforr
General Manager Berlin Street Railway System, Inc.,
Berlin, Germany

This series of two articles is based upon an article by the author entitled "Die Entwicklung des Wagenparks der Berliner Strassenbahn," in the *Zeitschrift des Vereines deutscher Ingenieure* for Nov. 13, 1926, supplemented by other information just received by ELECTRIC RAILWAY JOURNAL from Mr. Pforr.

DEVELOPMENT of car design in Berlin, Germany, up to the present time was discussed in the article published in this paper for Jan. 29, 1927. Some particulars were given of the experimental use of Cardan drive on several recent cars. The general principle of the application of this system of drive is shown in Fig. 15. This particular car has a weight empty of 12.15 metric tons (26,730 lb.) and a gear reduction of $\frac{34 \times 40}{14 \times 16} = 6.1$.

In some motor cars under construction, the installation of Cardan drive is being made with a single motor of double capacity instead of two motors of 35 kw. (47 hp.) capacity. Such a motor will have two sets of gears as shown in Fig. 16. It will be noted that this is a modification of the former Cardan drive and that both axles are connected mechanically together by means of Cardan gearing. The motor is set midway between the two axles and has a capacity of 70 kw. (93 hp.) and a speed of 1,200 r.p.m. With this size of motor, as with the two motor equipment, it is possible for a motor car to haul two trailers.

Figs. 17 and 18 show the appearance of the Cardan gearing in our experimental car after running 54,000 km. (33,750 miles). As will be seen it shows practically no evidences of wear. Since these views were taken the car and gearing have completed 93,000 km. (58,000 miles) in operation, with no more appreciable wear on the gears than that shown in the illustrations. Moreover, the gearing is operating as noiselessly as at first. These results, as well as the high efficiency of the combination, are to be attributed largely to the method of drive employed. In addition, the Cardan drive possesses the following advantages over spur gearing:

ADDITIONAL ADVANTAGES OF CARDAN DRIVE

1. The operation of the gearing is accompanied by very little noise, partly because the operation is in an oil bath and also partly because the elimination of motor axle bearings makes possible permanent precision in the meshing of gears.

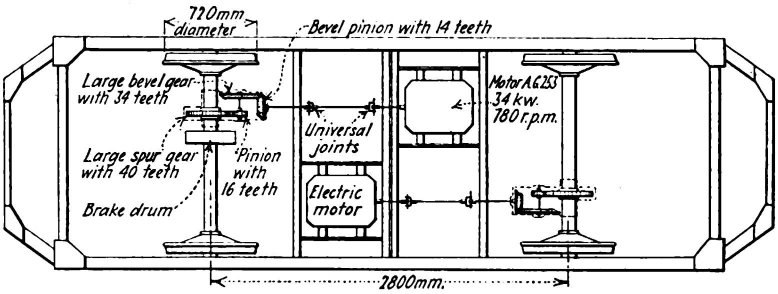

720mm diameter
Bevel pinion with 14 teeth
Large bevel gear with 34 teeth
Large spur gear with 40 teeth
Brake drum
Pinion with 16 teeth
Universal joints
Electric motor
Motor A.G.253 34 kw. 780 r.p.m.
2800mm.

Fig. 15—Plan of Floor Framing of Car with Two Cardan-Drive Motors

2. Wear on the faces of the teeth is very small.
3. Abandonment of the motor axle bearings does away with the necessity of their maintenance.
4. Addition of lubricant to the gear system is necessary only infrequently.
5. Owing to the complete spring support of the motors, the life of the roller bearings, including their housings, is greatly increased.
6. The removal of the motor from the axle greatly reduces the non-spring supported weight of the car.
7. Locating the motors with their armatures at right angles to the axle of the car makes it practicable to drive both car axles with one motor and obtain excellent braking and acceleration. As shown in Figs. 20 and 21, we have adopted this form of construction for our new trains with two motor cars, obtaining traction on all

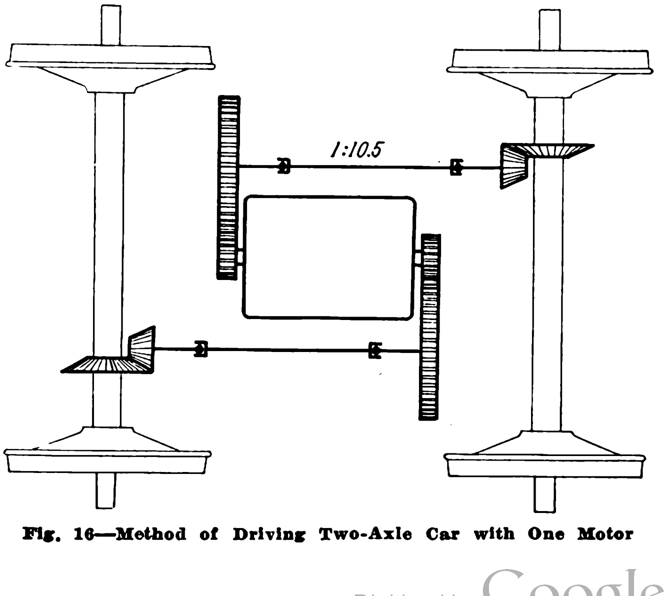


Fig. 16—Method of Driving Two-Axle Car with One Motor

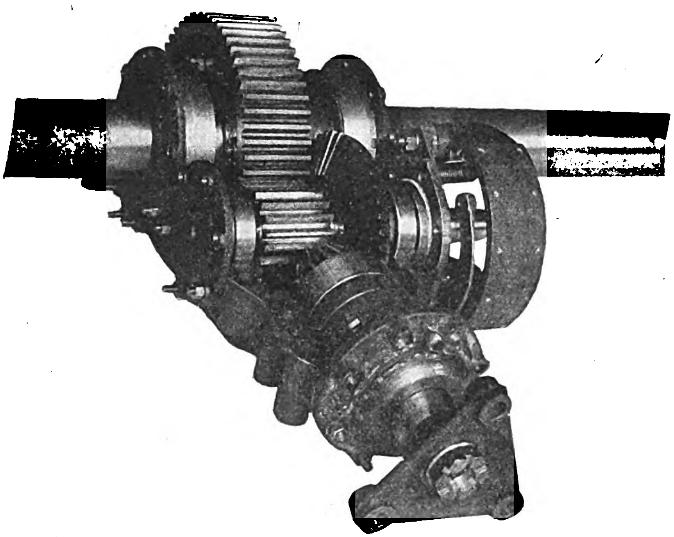


Fig. 17—Cardan-Drive Gearing with Cover Removed, of the type Shown in Fig. 15, Operated in Experimental Service. In This Case the Brake Drum Is on the Gear Shaft and Not on the Axle

eight wheels with but two motors. The result is we have a two-car train carrying 140 passengers and driven with but two motors, which possess good braking and acceleration. It is obvious that both first cost and maintenance cost of two motors is less than if four motors of the same total capacity were used. It appears to us that this arrangement might be of interest to American properties.

8. Suspension of the motors from the car body permits greater latitude in the height of the car floor, and step heights can be made less than with spur gearing.

9. The motor and gear drive can be constructed together as a unit.

10. It is possible to use higher speed motors than with spur gearing.

11. It is also possible to build motors with a greater armature length, as this length is not limited by the wheel gage, as with spur gearing.

12. The entrance of gear grease into the motors, which sometimes occurs, especially with motors of the ventilated type when spur gearing is used, is impossible.

APPLICATION TO TWO-CAR TRAINS

Use of motor cars along with trail cars presents some operating difficulties since considerable switching has to be done at the ends of lines unless there are loops. This indicates the desirability of making up each two-car unit not of a motor car and trail car, but of two motor cars and having in each motor car a motor of sufficient capacity to operate it independently. This for Berlin conditions was decided to mean a motor of 35 kw. (47 hp.) capacity and the system of drive shown in Fig. 19. As will be seen from the diagram and gear ratio, this meant a motor speed of about 800 r.p.m. with a single bevel gear drive for each axle. Instead of the bevel gear drive, a worm drive can be used, if desired, and it will have the advantage that it will permit a gear ratio of 1 to 9 and allow the use of a higher speed motor. One car with worm drive is being built for the Berlin Street Railway and will be put in operation within a short time. As to the results to be achieved it is impossible now to say.

Two coupled motor cars with the method of drive illustrated in Fig. 19 have been fitted up and are shown in elevation in Figs. 20 and 21. This method of drive has been applied to two cars exactly alike and designed always to be coupled together, and this articulated unit will shortly be put in service. Ten other cars of this kind are now under construction. They are of the center entrance type. The wheels are of 650 mm. (25½ in.) diameter and the wheelbase is 3.2 m. (10 ft. 6 in.). The body length outside of posts is 11 m. (36 ft. 1 in.) and the running gear is of the Peckham type with pendulum action so as to permit some axial displacement. Thereby the effect of blows to the car body due to bad track and at entrance to curves is reduced. At the same time the side thrust of the axle on the roller bearings is reduced, and this should have a material effect on their life.

The use of small diameter wheels and center entrance and the fact that the motors are attached to the body of the car allows the car floor to be about 130 mm. (5⅛ in.) lower than on the other recent type of cars of the company, as shown in Fig. 11 (see previous article). This facilitates the boarding and alighting of passengers. Moreover, since it is possible with the center entrance car to combine the space formerly taken by the two end platforms in one large center platform, it is practicable to install two separate doors of ample width to permit a passenger to enter and another to leave the car at the same time. A gain is also made of four seats, and passengers no longer interfere with the motorman in boarding or leaving as with end platforms. Lastly, the conductor has better control over entrances and exits than when one door is at one end of the car and one at the other.

DOUBLE-DECK CARS NOT DESIRABLE

In addition to these advantages of the center-entrance car, the two-car train has the further advantage that the cars do not have to be uncoupled at the ends of the line. All axles of the two-car train are driven, permitting rapid acceleration and better braking. There has been some agitation in the daily press that the Berlin Street Railway should put on double-deck cars to increase the seating capacity. Such a policy is not desirable, especially since Berlin has a number of points on its streets where there is little clearance under the

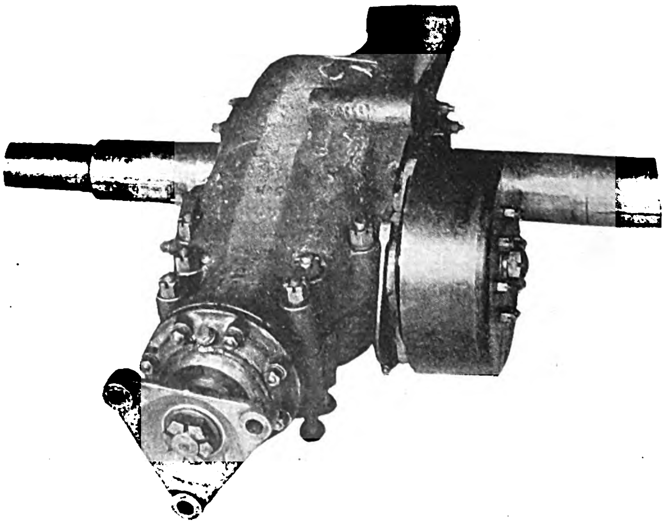


Fig. 18—Cardan-Drive Gearing Shown in Fig. 17, but with Cover in Place

Stadtbahn and the elevated railway, so that general use of double-deck cars is not practicable. Moreover, such cars have the operating disadvantage that they are much slower in unloading than a single-deck car, so that the operation of double deckers on any route slows down the schedule speed of all cars on that route. These disadvantages of the double-deck car are well recognized in Paris and Vienna, and it is for this reason that no more cars of that type are being added to the rolling stock in either of those two cities.

GENERAL REVIEW AND OUTLOOK FOR THE FUTURE

It will be seen from what has been said that the development in Berlin car design has been from a small four-wheel car, through a heavy eight-wheel car and then to a steel, yet light, four-wheel car of large size. These final four-wheel cars have no wheel brakes and no special truck. Moreover, they are fitted with roller bearings in the car journals, small diameter wheels and high-speed motors. In the new cars the high-speed motors are still mounted on the axle, but it is impossible to deny that this method of drive has its disadvantages and it may be that the Cardan drive, which is now being tried experimentally, may prove more desirable than the old method of mounting. Experience will also show whether the center-entrance car is not better designed for operation in large cities than the end-entrance type of car. Finally, tests now being conducted in Berlin will determine whether a two-car train, with the cars permanently coupled and all axles driven, will not give better acceleration and better braking than the former plan of using a motor and a trailer. In the effort to obtain higher schedule speed, light cars, short stops to receive and discharge passengers, and high rates of acceleration and braking ought to be of great help to the management.

ONE OVERHAUL AND TWO INSPECTIONS A YEAR

It is with these points in view that the types of rolling stock described have been developed. With these, effort has been made toward low first cost combined with durability and light weight and especially that the cost of maintenance should be kept as low as possible. With this purpose in mind, a motor car has been sought which would no longer require daily inspection but only a thorough examination at much longer intervals. The goal aimed at was an overhaul once a year with two thorough inspections between overhauls. Such an inspection would be given at the main repair shop, but in the shortest time possible. To this would be added repainting once a year because attractive appearance helps to sell the service to passengers. Another merchandising factor in car operation is good illumination. Still another is heating. Both points are being cared for in the new rolling stock, the heating in the trailers being from the trolley circuit and in the motor cars by the current used in the starting rheostats and that used in braking.

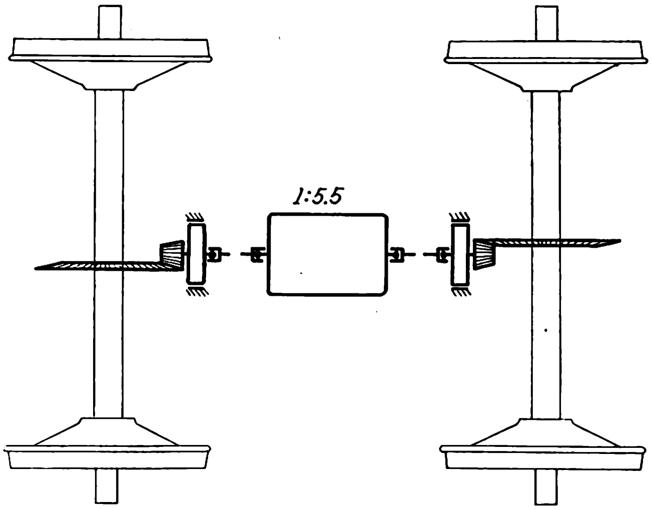
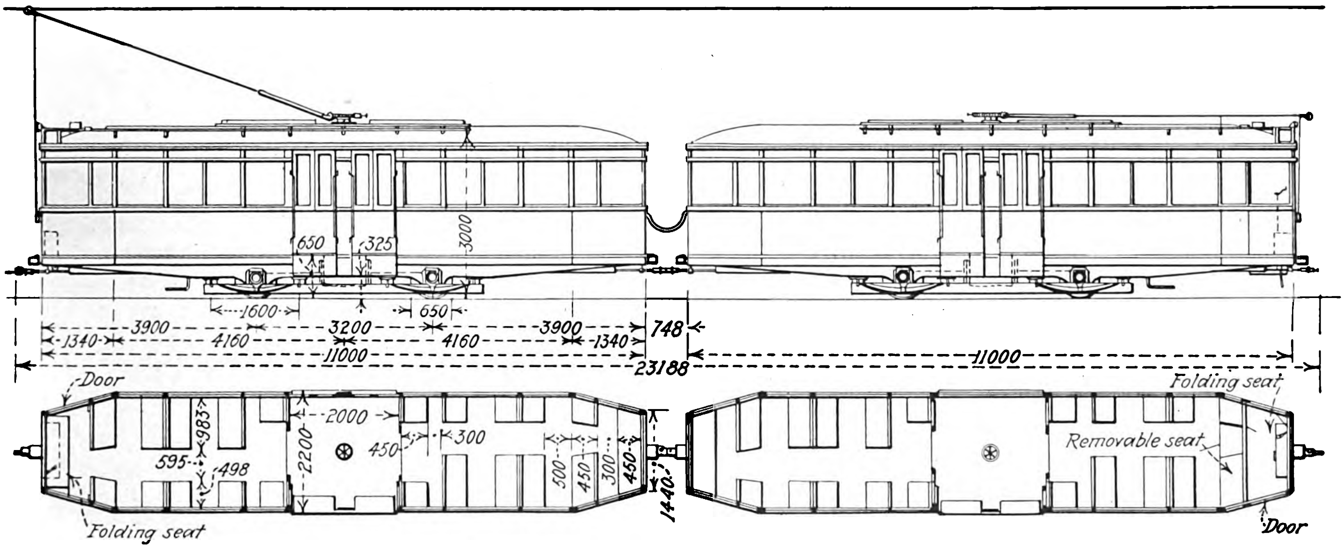


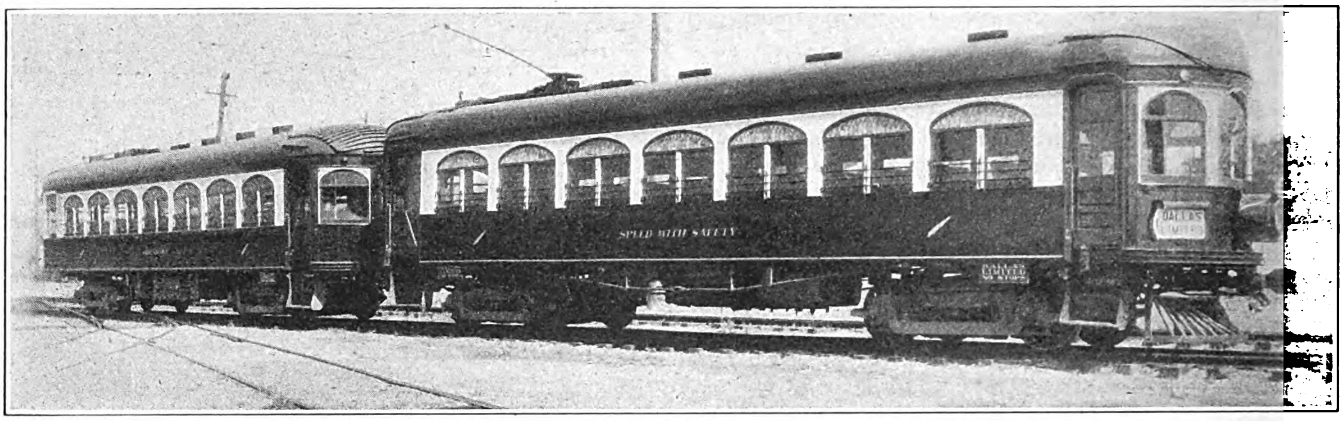
Fig. 19—Method of Cardan Drive Used on Train with Two Permanently Coupled Motor Cars

OLD CARS TO BE RETIRED

It is the purpose of the management of the Berlin Street Railway to retire as rapidly as it can its cars of small capacity. The car of the future is the one light in weight with large capacity and high rate of acceleration and braking. If such cars can also be made rugged in construction as well as comparatively easy to build and maintain, railways possessing such rolling stock can face with confidence competition with other means of transit.



Figs. 20 and 21—Elevation and Plan of Train, with Motor Equipment Similar to That Shown in Fig. 19. All Dimensions Are in Millimeters



The Crimson Limited Covers the Distance Between Fort Worth City Limits and Dallas, 28 Miles, in 34 Minutes

More Comforts Added to Crimson Limited

In Addition to Repainting and General Overhauling Changes were Made in the Lighting System and Many Other Conveniences were Installed

By George Hoskins

Master Mechanic Northern Texas Traction Company,
Fort Worth, Tex.

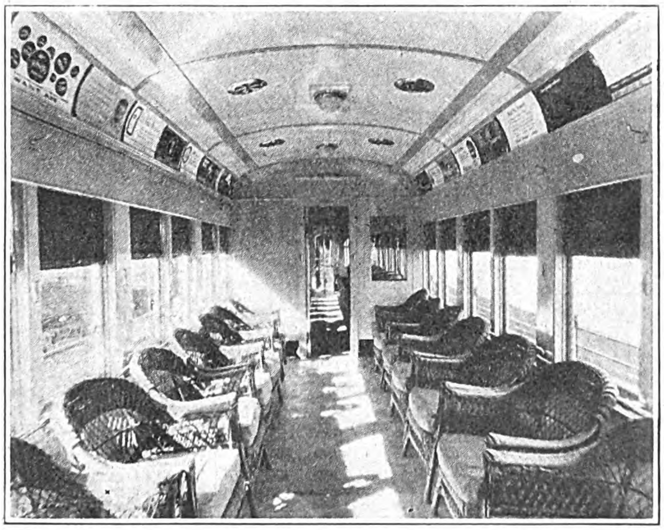
BESIDE its working slogan "Dependable, Safe and Economical" the Northern Texas Traction Company might well add the words "Comfortable and Attractive," because it is toward these ends that much thought is being given at the present time and much work accomplished.

The company has since its beginning maintained a high-class, non-stop service between Fort Worth and Dallas. In 1925 the Crimson Limited was inaugurated. Trains in this service were painted red and white on the outside and finished in natural mahogany on the interior. Floors were covered with ¼-in. green cork linoleum. The rear vestibules of the trailers were arranged for observation and wicker chairs were installed after removing the seats from the rear compartment.

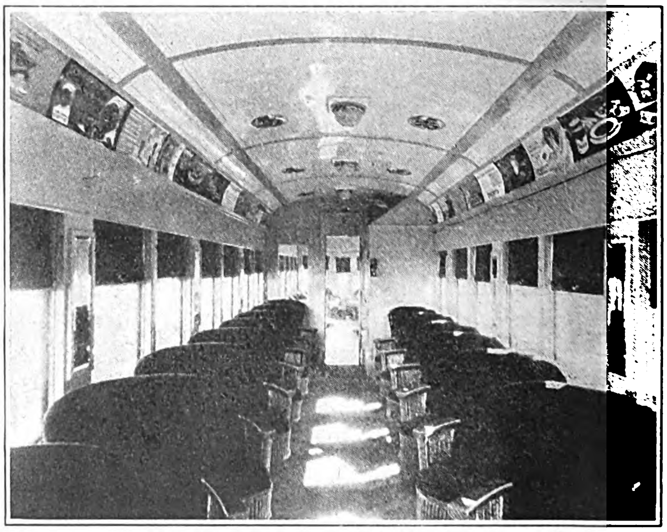
During September of this year one of these trains was brought into the Fort Worth shops and further changes and additions were made to give greater comfort and make the cars more attractive. The outsides of the cars were repainted red and white and the interiors were painted a pale azure striped with cream. All metal fittings were nickel plated and completely equipped lavatories were installed in both cars. Narrow bevel mirrors were placed on the window posts to add to the appearance and also for the convenience of passengers.

Changes were also made in the system of lighting. Originally the cars had a row of lamps on each side. These were replaced by dome lighting fixtures arranged in a row down the center. A baggage rack was installed in the trail car in the front vestibule. Seats were removed from the front compartment and the floor was covered with a heavy Brussels carpet. Fifteen revolving parlor car reed chairs, upholstered in green plush, were installed.

In the rear or observation compartment the floor was covered with linoleum having a clouded appearance over 6-in. blue and white inlaid blocks. A nickel-plated chair rail was also installed and the same chairs were refinished for use. This train as refinished and equipped was placed in service again at the beginning of the Texas State Fair at Dallas and has brought many favorable comments from the railway passengers who make use of this service.



The Rear Observation Compartment Is Provided with Wicker Chairs



Revolving Reed Chairs Upholstered with Green Plush Were Installed in the Front Compartment

Interesting Construction on Cleveland Car Station

Preparatory to Constructing a New Car Station on West 117th Street, It Was Necessary to Build Drainage Culvert—Method Used to Construct This Culvert Illustrated

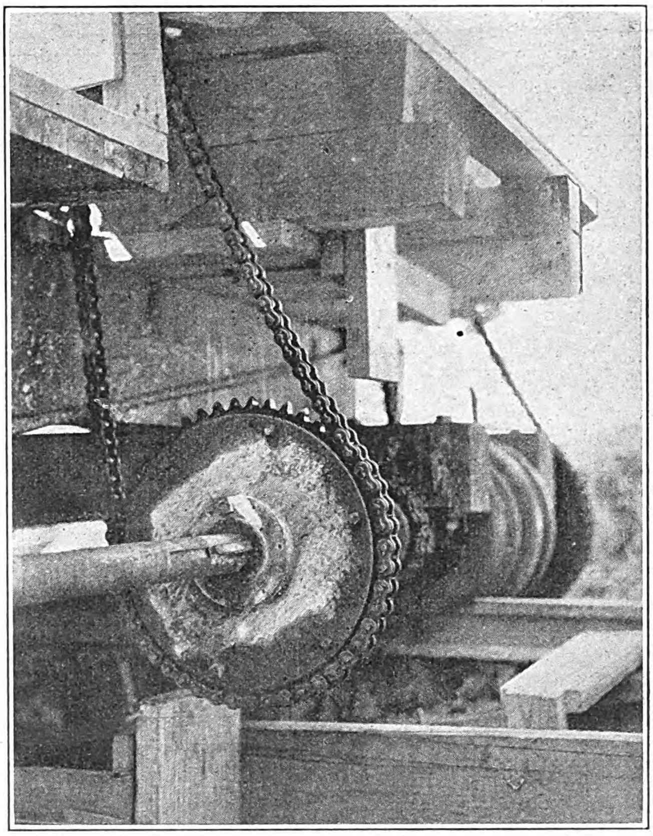
PROPERTY on which the new car station of the Cleveland Railway at West 117th Street and Linnet Avenue was to be built had a stream running through it in a deep ditch. This necessitated the construction of a culvert. Because of the broad curve of this open ditch and stream certain problems were presented that were solved by the use of a traveling bridge designed to carry batches of concrete from the mixer located at one end of the property abutting the street.

This bridge, shown in several of the views, has a span of 36 ft. from rail to rail on which it runs. For a short distance the 36-ft. gage track is tangent and then swings onto a long curve having an inside rail radius of 197.26 ft. and an outside rail radius of 233.07 ft. The problem was naturally to construct the bridge and track so that the bridge would swing around the curve, even though the outer wheel must travel a longer distance. This was accomplished by using a larger diameter wheel on the outer end of the bridge that came into play on an offset rail just at the point of tangency with the curve.

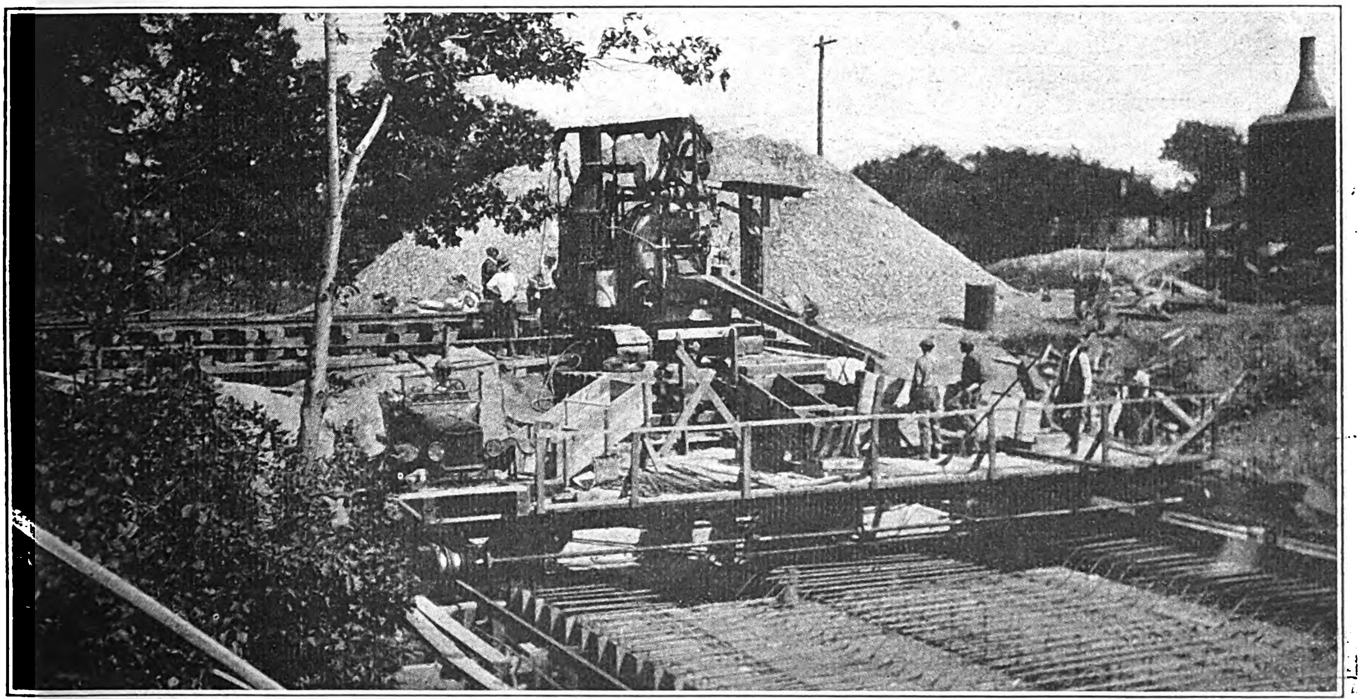
Curve Rail Offset to Accommodate Large Wheel

The wheels used on the tangent sections are of the same diameter on each end of the axles, namely, 12 in. The two larger wheels on the outer end of the bridge are of 14¼ in. diameter and are mounted adjacent to the smaller ones. The size was calculated previously to give the proper swing to the outer end of the bridge when traveling around the curve. To accommodate the outer or larger wheel the rail on the curve is offset as shown in the views, leaving an overlap to provide easy rolling from one rail to the other.

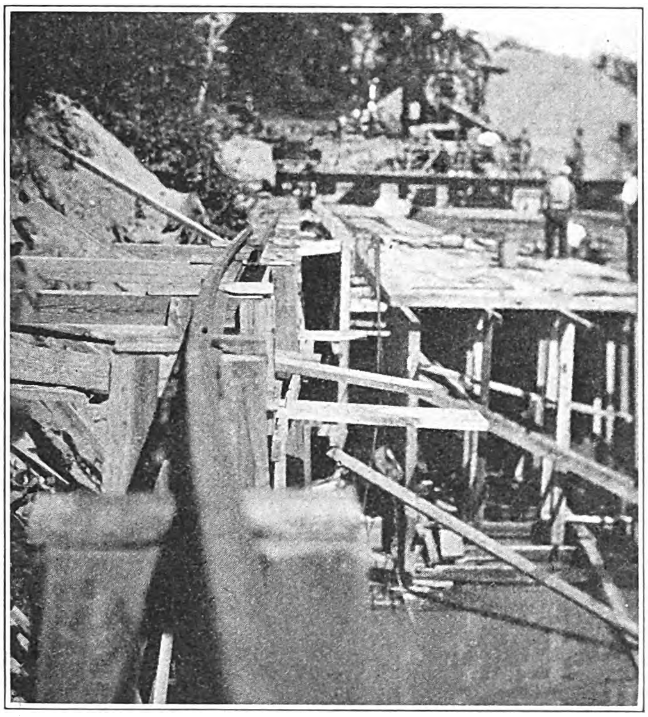
A Ford automobile has been rigged up on one end of the bridge to furnish the propulsion power. Rear wheels have been removed and sprockets substituted that drive, by means of chains, both axles of the bridge.



The Traveling Bridge Used on Cleveland Railway Culvert Construction Is Driven by a Ford Automobile with Sprockets Substituted for Wheels and Connected to the Two 36-Ft. Axles by Sprocket Chains, as Illustrated in This View



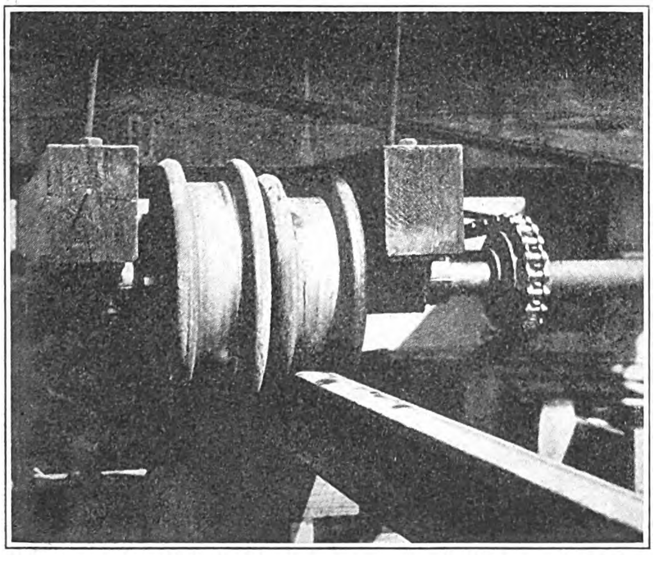
Mixing Plant at One End of the 400-Ft. Culvert Being Constructed Prior to the Erection of the New Car Station of Cleveland Railway on West 117th Street. A Ford-Driven 36-Ft. Bridge Carries the Mix and Other Materials to Any Point on the Job, Part of Which Extends Around a Curve



At the Point of Tangency on the 400-Ft. Runway Over the Culvert a Second Rail Is Used to Accommodate a Larger Wheel, Allowing Bridge to Swing Around Curve in Perfect Alignment

Some little difficulty was experienced at first in the relative forward and reverse speeds. The outbound speed with the load was rapid, but in the reverse direction it was too slow. To overcome this the sprockets were changed to give the same outbound speed as originally planned but with the engine in second speed. Since the reverse speed of a Ford drive has nearly the same speed as second, this difficulty was overcome and the operation of the bridge made practically the same in each direction.

Two culverts of reinforced concrete were built in this manner by the Bituminous Construction Company for the Cleveland Railway. Each is 10 ft. high by 12 ft. 6 in. wide. When complete the culverts will be covered over and the car station and tracks constructed on top of this structure.



The Tangent Running Wheels Are 12 In. Diameter. To the Left Is One of the 14¼-In. Wheels that Engages a Rail in that Position, Allowing the 36-Ft. Bridge to Travel Around the Curve in Proper Alignment

Des Moines Pass Riders Increase

MORE than 10,000 Des Moines citizens are now users of the weekly pass recently started by the Des Moines City Railway, Des Moines, Iowa. The pass idea started with the Sunday pass for 25 cents, which materially increased riding on these otherwise light traffic days.

Some of the suggestions for pass use offered by the company are as follows:

Ride to lunch at home or favorite restaurant or club.

Go to lodge meeting, prayer meeting, entertainment at night.

Loan your pass to the wife, so that she can shop before dinner.

Loan your pass to one of the youngsters for the evening.

Ride as short a distance as you please, to escape rain or snow, or to let the car carry your parcels.

A message to the automobile user is contained in an estimate of operating costs totaling 9 cents a mile, made up of the following items:

	Cents
Cost of car	3.0
Repairs	0.5
Gasoline and oil	2.5
Tires	1.5
Storage, taxes, insurance	1.5
Total	9.0

You can ride in a closed car with driver on a weekly pass for 1 cent a mile. Think what you could buy with the difference!

Another stunt used to increase interest in pass usage is a lucky number contest, by which five lucky numbers are chosen each week, entitling the winners to a prize of a $1.25 pass plus a ticket to a local theater.

On Nov. 20, 1926, a new contest was announced and $25 was distributed to the seven best writers of letters on the use of the pass. The letters were judged by a committee of Des Moines business men and the prize winners were announced in a December issue of the company leaflet distributed on the cars.

Modern Equipment Described for Passengers

THE Pennsylvania Railroad is distributing a fourteen-page pamphlet in which modern cars and locomotives of the various types and classes now in use on the system are pictured and described. In addition to 30 pictures of the leading types of locomotives and cars now in service on the Pennsylvania, the pamphlet includes a short preface, seven pictures of cars and locomotives used in the early days of railroading in America, and eight views of the Altoona works, the principal shops of the Pennsylvania Railroad and the largest railroad shops in the world.

The illustrations of modern locomotives and cars include ten pictures of steam locomotives, four electric locomotives, electric passenger locomotive, electric switching locomotive, electric passenger and freight locomotive, electric passenger coach, gasoline-electric rail motor car, standard passenger coach, combination passenger and baggage car, dining car, mail car, combination baggage-mail car, baggage car, box car, automobile box car, refrigerator car, stock car, flat car, low-side gondola car, high-side gondola car and hopper car.

Each type of locomotive and car is accompanied by a brief description giving the salient facts in regard to weight, length, capacity and tractive power.

The Readers' Forum

Attractive Cars Increase Riding

CUMBERLAND COUNTY POWER & LIGHT COMPANY

PORTLAND, ME., Jan. 19, 1927.

To the Editor:

I am in hearty co-operation with the idea expressed in the article on attractive car appearance which appeared in the Jan. 15 issue of ELECTRIC RAILWAY JOURNAL. The best reason for the use of modern and well-maintained cars is to attract more passengers and give a lasting impression of comfort, regularity of service and safety. They will induce more people to use the cars regularly since people will ride in the conveyances that they find give them the most comfortable and dependable service.

The general appearance of rolling stock as viewed from the street is one of the best advertisements of the class of service given by a railway. Good maintenance is by far the cheapest. Special attention should be paid to cleanliness, heating, lighting, seats, ventilation, reduction of noise, proper destination signs and riding qualities of both cars and tracks.

Motormen and conductors should be well trained in salesmanship, neatness and high-operating ability so as to make the ride pleasant and safe. When this is done the number of riders will increase.

R. T. CHILES,
Master Mechanic.

Attractive Cars and Frequent Service Solved Fort Wayne Problem

INDIANA SERVICE CORPORATION

FORT WAYNE, IND., Jan. 26, 1927.

To the Editor:

Some years ago the Indiana Service Corporation began buying cars. As a result, all of the cars now in regular operation are of very short average age, the oldest dating from 1918. In the evening rush hour we use some trippers that go to the factories and pick up employees who are carried to the various lines without transfer. These cars date back to 1911, but they are the very oldest cars we own. However, the 1911 cars are only used for one trip in the evening rush and all other cars are 1918 or more recent still.

At the time the first modern cars were bought, that is to say about 1918, this company went into the proposition of using a distinctive color. Fort Wayne has narrow streets and some of them have heavy traffic for a city of this size. It was thought necessary to have a very bright, attractive color for the cars because of the street congestion and also because of the fact that such a bright color acts as a good sales argument in advising the public that a car is approaching. The color selected was a bright lemon yellow. It has been adhered to ever since. The results obtained with this color were all that could have been desired. The cars are very easily picked out from other traffic on the street.

We attempt to keep them well painted and well cleaned, because our street cars are our show window and we want them kept in the most attractive form possible.

We operate a large number of car-miles because we believe that frequency of service is a very important factor with the public. All cars in Fort Wayne are one-man operated. The public apparently is pleased with the service, and while we do receive complaints occasionally, these are decidedly infrequent.

Of course, in connection with the cars, we have also put forth every effort to keep the track in good condition, because a good car operating over a rough track will not give a smooth ride and the public insists on having the smoothest ride possible.

HENRY BUCHER,
Manager Railway Department.

Safe, Clean and Comfortable Cars a First Need

SHREVEPORT RAILWAYS

SHREVEPORT, LA., Jan. 25, 1927.

To the Editor:

The providing of greater comfort, safety and convenience for the traveling public is indeed an important subject and requires constant thought and study. The first duty of a street car company is to provide cars that are sound, safe, clean and as comfortable as possible. The service must be frequent and dependable. The speed should be as fast as safety will permit. The employees on cars must be courteous and obliging to the traveling public at all times. After these things we begin to think of the refinements that will attract new business, and we should go as far in that direction as the earnings will permit.

When purchasing new cars, we have tried to get the latest features in design, that will increase the safety and riding qualities. To improve the lighting, we replaced the green ceiling with white, and replaced the cluster lights in the center of the ceiling by distributing the lamps on each side. These changes have brought out very complimentary remarks from the patrons of our line.

We replaced the monitor roofs with arch roofs. This also improved the appearance and made the car lighter. To improve the riding qualities, we are revamping all of the older type trucks with the latest Brill system of spring suspension and brakes.

To eliminate noise we are replacing the split spur gears with solid helical gears and pinions. We have adhered to the Pullman green color for the outside of our cars. This we find durable and in harmony with the buildings and surroundings along our tracks. Our sash, doors and inside trim are of cherry.

We have not departed from the use of slat seats, about which we have never had any complaints from our patrons. For short rides we do not believe seat upholstering is justified, under the low rate of fare fixed by the government authorities. We have never had any complaint about the riding qualities of our double-truck cars, but the single-truck cars are not satisfactory except on very smooth tracks. We have determined never to buy or build any more single-truck cars, because it is almost impossible to keep the track smooth enough for these cars to give satisfactory riding.

H. B. HEARN,
President.

Maintenance Notes

Southern Properties' Pull-In Record

FIGURES for the year 1926 compiled by the Electric Railway Association of Equipment Men, Southern Properties, show an average of 17,200 car-miles per pull-in chargeable to equipment. The average for thirteen companies during the past year is slightly under that for twelve companies in 1925, when the average was 17,350 car-miles per chargeable pull-in. The combined total for all companies in the association last year was 4,817 chargeable pull-ins, of which 4,320 were reported by the twelve railways which reported 4,655. Total pull-ins chargeable to equipment and otherwise numbered 7,222 in 1926, of which 6,665 were on properties reporting 6,832 the preceding year.

New Orleans, Nashville and Knoxville stood first, second and third in the mileage per chargeable pull-in last year as they did before.

Comparative Statement of Car Pull-Ins for Year 1926, Southern Properties

Not Chargeable to Carhouse

	New Orleans	Nashville	Knoxville	Atlanta	Little Rock	Birmingham	Texas Electric (Dallas)	Memphis	Mobile	Dallas	Covington, Ky.	Montgomery	Chattanooga
Armatures	13	11	8	64	8	171	51	81	18	147	43	54	82
Armature bands	......	......	......	1	3	24	......	9	5	10	......	2	72
Armature shafts	......	......	......	4	......	19	4	9	......	4	......	......	1
Armature bearings hot	......	10	......	3	......	18	11	20	5	14	5	3	15
Axle bearings hot	......	......	1	......	......	......	5	8	......	1	......	8	1
Commutator	......	......	......	......	......	14	17	13	1	6	3	7	17
Brush yoke	......	2	......	1	......	......	1	3	2	8	......	4	......
Brushes and holders	1	......	......	25	3	23	11	41	5	32	24	27	31
Fields	6	13	2	23	9	127	10	27	12	65	12	76	28
Field jumpers	......	2	......	13	7	8	2	3	4	47	......	7	17
Motor leads	1	4	......	10	7	16	18	15	8	35	17	44	25
Gears and pinions	1	......	......	8	......	7	6	1	......	9	......	4	11
Gear cases	......	......	1	2	......	4	......	......	2	5	3	4	5
Other motor trouble	......	......	......	......	......	2	1	12	4	29	......	20	2
Trolleys	......	1	4	6	2	2	14	4	1	1	6	2	16
Circuit breakers	1	......	3	6	1	2	1	1	......	22	4	2	9
Line breakers	3	......	6	9	6	1	14	29	2	6	......	......	14
Main fuse	......	......	......	......	......	......	......	3	......	......	......	......	......
Controller	3	2	12	21	10	9	22	37	9	16	20	40	41
Cables	5	......	3	16	6	12	22	16	2	17	6	22	20
Rheostats	1	......	4	8	2	12	7	12	3	8	6	10	5
Air brakes	2	2	4	26	17	17	38	14	20	76	2	12	115
Safety car equipment	......	......	......	14	12	......	6	29	7	......	......	28	......
Door engines	......	......	......	......	......	1	......	1	......	6	......	......	......
Whistles	......	......	......	......	......	......	......	......	......	......	......	......	......
Frozen air	......	......	......	......	......	......	......	12	......	......	......	......	......
Other air troubles	......	......	3	......	......	1	2	8	1	76	......	5	......
Lights	1	......	......	2	2	5	1	2	2	3	5	......	4
Headlights	......	......	......	1	2	3	3	11	1	5	......	32	5
Signal lights	......	......	......	......	......	......	......	......	......	......	......	......	......
Door switch	......	......	......	1	......	......	......	......	......	2	......	......	......
Heaters	......	......	......	2	......	......	9	1	......	2	11	......	2
Electric bells	......	......	......	2	1	4	1	1	8	16	2	4	2
Lightning	......	......	2	......	......	7	15	22	......	......	......	7	6
Car charged	......	......	......	2	......	......	......	......	2	2	......	......	......
Axles	7	......	5	4	2	4	2	7	......	8	......	2	2
Wheels	1	......	1	5	......	19	2	3	......	2	......	7	10
Journals and boxes	......	......	......	1	......	10	1	2	1	......	......	......	7
Hot journals	......	......	......	6	2	14	4	1	......	7	6	1	12
Hand brakes	......	......	......	......	2	1	......	......	2	......	39	14	3
Slack adjusters	......	......	......	......	......	......	......	......	1	3	......	......	......
Brake rigging	8	......	7	27	6	32	10	33	12	73	......	13	113
Other truck troubles	......	......	......	......	1	23	10	3	3	28	7	2	5
Doors and riggings	......	......	......	1	1	8	1	11	5	17	......	10	51
Door treadles	......	......	......	......	......	1	......	6	......	9	......	......	2
Windows	......	......	......	......	2	1	1	......	......	1	......	1	7
Seats	......	......	......	......	......	......	......	7	3	2	......	2	3
Steps	......	......	......	......	......	1	1	2	1	4	......	3	5
Registers	......	......	......	1	......	......	......	2	3	......	......	5	1
Signs	......	......	......	......	......	......	......	......	......	......	......	......	1
Gongs	......	......	......	1	6	1	6	7	2	3	3	5	9
Sand rigging	......	......	......	3	......	......	......	1	......	......	3	3	7
Fenders	......	......	1	......	......	1	......	1	......	1	5	......	23
Draw bars	......	......	......	......	......	5	......	......	......	......	......	......	......
Snow scrapers	......	......	......	......	......	......	......	......	......	......	......	......	......
Other body troubles	2	......	......	1	......	14	2	7	2	7	3	5	11
Unclassified	......	......	1	......	4	2	11	20	4	41	7	......	52
Total chargeable to equip.	56	47	68	320	124	646	343	558	161	876	242	497	870
Total car-miles	14,620,719	5,580,039	3,615,130	13,228,990	2,900,266	11,324,827	5,426,129	8,000,309	2,097,729	9,124,008	4,043,083	1,596,064	1,392,832
Average pull-ins per day	.15	.13	.19	.88	.34	1.77	.93	1.53	.43	2.40	.66	1.36	2.38
Average miles per pull-in	261,084	118,724	54,866	41,340	23,389	17,531	15,829	14,337	13,029	10,416	16,707	3,211	1,501

Chargeable to Carhouse

	New Orleans	Nashville	Knoxville	Atlanta	Little Rock	Birmingham	Texas Electric (Dallas)	Memphis	Mobile	Dallas	Covington, Ky.	Montgomery	Chattanooga
Accidents	86	39	28	163	56	136	26	204	59	195	93	32	219
Split switches	......	19	6	8	1	8	3	4	1	3	......	......	......
Derailments	2	4	7	3	......	8	9	......	4	13	6	4	7
Doors and steps	1	......	......	3	......	5	13	......	3	......	8	6	......
Broken glass	......	13	......	2	1	3	18	11	12	68	67	7	11
Trouble reported, none found	......	......	1	9	1	4	4	26	2	58	17	10	139
Unclassified	......	2	3	1	......	1	38	6	1	99	278	1	......
Total not chargeable to equip.	89	77	45	189	59	165	107	251	82	436	469	60	376
Average pull-ins per day	.24	.21	.12	.52	.16	.45	.29	.69	.22	1.19	1.28	.16	1.03
Average miles per pull-in	164,277	72,468	31,670	69,995	49,159	68,635	50,712	31,874	25,582	20,927	8,621	26,601	3,704
Total pull-ins	145	124	113	509	183	811	450	809	243	1,312	711	557	1,246
Total average pull-ins per day	.40	.34	.31	1.39	.59	2.22	1.23	2.22	.66	3.59	1.94	1.52	3.41
Total average miles per pull-in	100,833	45,000	32,524	25,991	15,848	13,964	12,058	9,889	8,633	5,954	5,686	2,865	1,118

"Nix on the nicks," while winding armatures,
Will minimize your broken lead failures.

Atlanta moved up from fifth place to fourth, and Little Rock from ninth to fifth. In all, eight railways made a better showing in 1926 than in 1925, while four reported smaller mileage per pull-in.

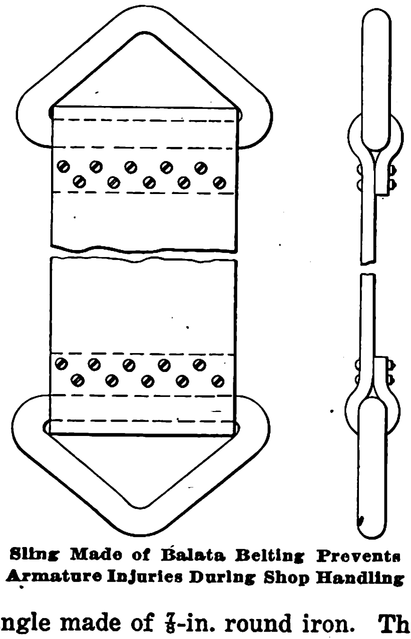
An accompanying table shows the number of pull-ins for each company listed under 64 classifications.

The principal classes of defects which have caused most detentions are: Armatures, fields, brushes and holders, controllers, air brakes, and brake rigging. This table also serves to give a very definite idea as to the classification of defects that is used.

Sling for Lifting and Carrying Armatures

LIFTING or carrying armatures by means of hooks, chain or rope slings offers the danger of mechanical injury at the bearing fit, and bells, commutator or end connections. To eliminate this possibility entirely a flat sling has proved satisfactory in the Interborough Rapid Transit Company shops in New York.

This sling is made of five-ply Balata belting 12 in. wide and on each end is installed a closed lifting triangle made of ⅞-in. round iron. The belting is lapped over one side of each triangle and made secure by numerous ¼-in. stove bolts. In lifting an armature the sling is placed around the core at the center of gravity and both triangles hooked on the lifting device.

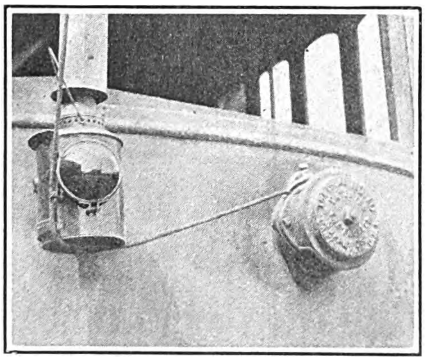


Sling Made of Balata Belting Prevents Armature Injuries During Shop Handling

New Style Tail Light Bracket with Spring Bolt Holds the Light in Position Securely

Spring Plunger Locks Tail Light in Place

ON CARS equipped with trolley catchers trouble was experienced by the Grand Rapids Railway, Grand Rapids, Mich., from the trolley rope catching underneath the tail light and lifting it out of its socket. Also, jars at crossovers frequently caused tail lights to become detached from the supporting brackets. In order to overcome this difficulty the bracket was fitted with a spring plunger. To install a tail light the plunger is pulled out against the tension of the spring. With the tail light installed in its bracket the plunger, when released, hooks over the bar of the tail light arm and so holds it down firmly. This has effectively overcome the difficulty. Accompanying illustrations show the method by which tail lights are now installed and are held in position by the plunger and also a tail light with the trolley rope caught underneath in a position to lift it out of the socket.



The Catching of a Trolley Rope Underneath a Tail Light Frequently Pulls the Tail Light out of Its Socket

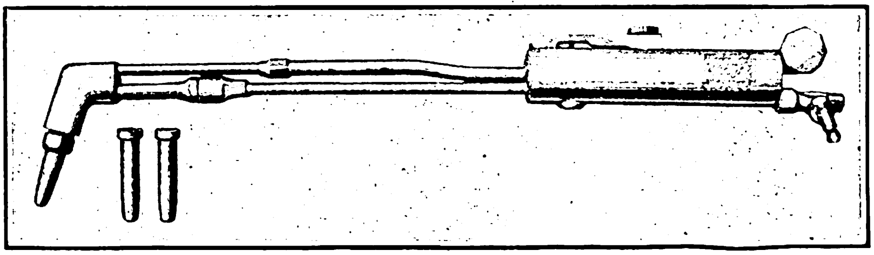
New Equipment Available

Torch Uses Oxy-Illuminating Gas

CUTTING of heavy plates, risers, gates, billets, etc., using either city gas, natural gas or by-product (coke oven) gas has been made possible by the development of a new oxy-illuminating gas cutting torch, manufactured by the Alexander Milburn Company, Baltimore, Md.

An interesting achievement of this type LPG torch is that it can be used with by-product (coke oven) gas. It is not necessary to have this gas scrubbed; it can be used just as it comes from the coke ovens. A recent test with this particular by-product gas with a low B.t.u. content showed a speed averaging 1 ft. per minute on 3-in. plate using 40 lb. oxygen pressure with the gas at ordinary line pressure without being boosted.

The cuts showed a sharp, clean edge, devoid of slag on the under-



Cutting Torch for Use with Illuminating Gas and Oxygen

side, a narrow kerf and very smooth surfaces. A very important feature is the absence of case-hardening of the surfaces, which makes for easier machining. The torch is made of bronze forgings and special seamless tubing, constructed to withstand constant and severe service. It is evenly balanced and ruggedly built. The high pressure cutting oxygen is controlled by a thumb valve.

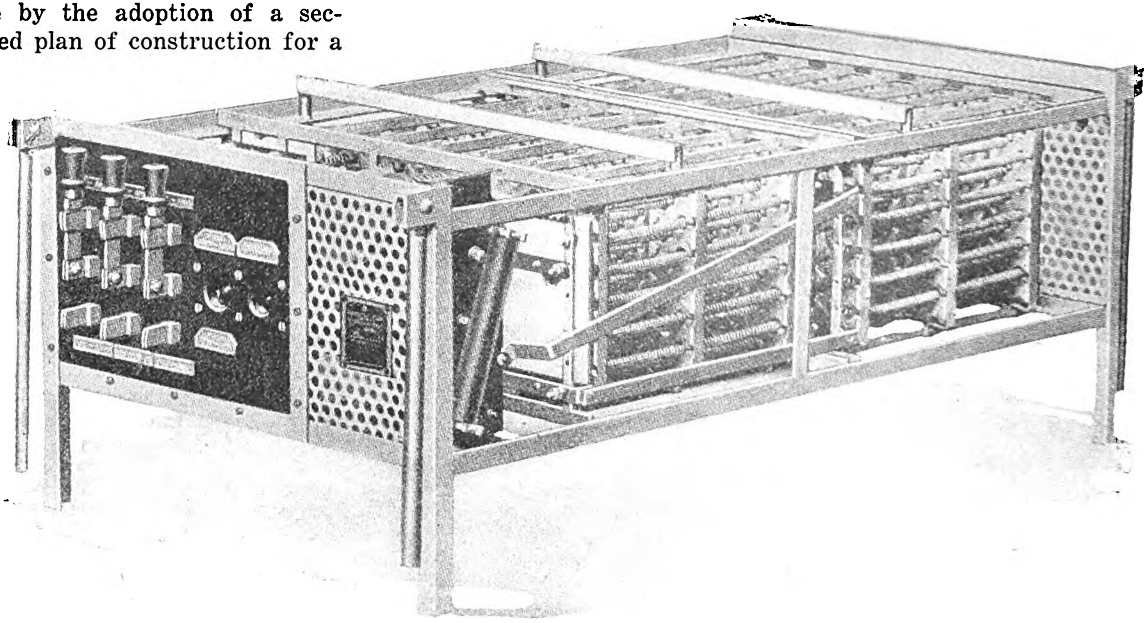
The torch is supplied with a range of tips to accommodate all thicknesses of metal. The tips are made of solid copper, designed rapidly to preheat the gases, giving better penetration and quicker cutting.

Welder Built on a Unit Basis

NECESSITY for having all the elements of a welder in one block has been eliminated and a reduction in voltage stress on insulators and resistance wires has been made possible by the adoption of a sectionalized plan of construction for a new type portable resistance welder put on the market by the Ohio Brass Company, Mansfield, Ohio. Insulators used for supporting the resistance coils are made of an especially developed heat-resisting porcelain. Absence of holes or sharp corners on these insulators prevents excessive breakage under rapid changes in temperature. The surfaces which support the resistance coils are convex in shape to provide a point contact between coils and porcelain.

Pressed steel upright supporting frames hold the insulators and resistance coils securely in position and at the same time provide clearance for the resistance wires. When assembled the insulators are interlocked. Retaining lugs on the frame are so spaced that should any of the insulators become cracked or broken as the result of unusual handling they will remain in position and the resistance coils cannot short or ground.

Each individual resistance element unit is a rigid and sturdy steel frame structure. Its design provides maximum protection both to the insulators and resistance coils and affords rapid heat dissipation. The spirally wound resistance wire is of a super-nickel-chromium resistance alloy made for continuous duty at temperatures approximately 50 per cent higher than those generally obtained in actual service. The wire resists oxidation and is non-corrosive. Undue stretching or sagging of the resistance coils is prevented by the close spacing used between the supports.



Portable Resistance Type Arc Welder Built on a Sectionalized Plan

The main frame is a one-piece unit made of 1-in. x 1-in. angle steel braced rigidly and arc welded. The cover is made of hot-dipped rust-treated galvanized iron perforated to give rapid heat dissipation. The complete unit is light and is easily carried by two men. It is equipped with handles which drop down out of the way when the machine is in operation. The legs of the welder are drilled and tapped for attaching clamping studs, axles and wheels, which are furnished on special order.

The fourteen individual resistance units are arranged in two element blocks of seven units each instead of in one complete element block. The element blocks are insulated from each other and from the main frame by mica tubes and washers. Voltage stress on any one resistance unit is thus reduced and possible short circuit is minimized. Any one of the individual resistance units in either block may be removed for inspection without disturbing the other units.

A heavy-duty shunt-type contactor provided with a magnetic blowout is connected in series with the welding circuit. It completes or breaks the circuit as the electrode touches or is withdrawn from the work. Control of the machine is provided by a push button on the electrode cable adjacent to the electrode holder. This gives complete voltage protection to the operator when changing electrodes by enabling him to control the welding circuit at a remote point instead of at the machine.

The welder operates on any voltage from 400 to 600 in current ranges of from 30 to 210 amp. The current is regulated in steps of 20 to 30 amp., depending on the line voltage, by three single-pole, double-throw switches. These permit the operator to adjust the current to the requirements of the work. The welder operates on 400 to 500 volts when the switches are in the lower position and on 500 to 600 volts when the switches are in the upper position. Marker plates opposite the switch controls indicate the position of knife switches for a given voltage. Current ratings of individual switches are shown by marker plates located above and below the switch contacts.

Association News & Discussions

Active Interest Shown at Southern Equipment Meeting

Annual Pull-In and Maintenance Cost Reports of Member Companies for the Year 1926 Show Improvement Over 1925—Major Part of Meeting Devoted to Discussion of Maintenance Practices

RAPID-FIRE questioning of the author of each paper by other members brought out constructive information at the Memphis meeting of the Electric Railway Association of Equipment Men, Southern Properties, held Jan. 26 to 28. A preliminary report of the meeting was published in this paper last week. Letters were read from W. H. Sawyer, president American Electric Railway Association, and J. W. Welsh, executive secretary, expressing regret at their inability to attend.

E. W. Ford, vice-president Memphis Street Railway, addressed the convention and complimented the association for its progress and the valuable contributions made to the industry since it was organized.

In his opening address A. D. McWhorter, general superintendent Memphis Street Railway, president of the association, said that the Southern properties continued to show lower and more uniform maintenance costs than in the past. These compare favorably with maintenance costs in other sections of the country. Good public relations are obtainable only through good service and good service is dependent on properly maintained, clean, well-painted and attractive cars. He called attention to the progress made by the industry in establishing bus service and extending one-man operation. Electric railways are rendering a most important service to the public at less cost than any other industry in the country. "We have made progress," he said, "but we must stay one jump ahead of the game or we are falling short in our duty to ourselves, our communities, and our companies."

C. J. Axtell, special railway engineer General Electric Company, read a paper on "Car Equipment Apparatus." He spoke in detail about the changes which had been made in the manufacture of standard apparatus in order to minimize failures, facilitate inspection and decrease maintenance costs and pointed out that manufacturers found it necessary to design equipment to suit the new and varied designs of light safety cars that are in operation today. An abstract of this paper appears elsewhere.

Following a lively discussion of Mr. Axtell's paper, R. S. Frehse, National Pneumatic Company, explained in a clear and concise manner how a circulating load is handled by means of a treadle-operated door. His paper is published in abstract elsewhere in this issue. T. R. Bristol, assistant superintendent of equipment Georgia Railway & Power Company, told of experience with 40 pneumatic treadle door equipments and 60 electro-pneumatic treadle door equipments. This paper explained in detail the troubles which had been experienced and how they were corrected.

E. L. Ray, employment agent Memphis Street Railway, presented a paper on the methods employed by his company in developing operators for the one-man cars. Requiring the motormen and the conductors to exchange positions for a few days under the guidance of an instructor soon provides skillful operators.

"Essential Features of Modern Cars" was the subject of a paper read by E. A. Palmer, special railway engineer Westinghouse Electric & Manufacturing Company. This paper will appear in abstract in a further issue of the JOURNAL.

In a paper on "Department Co-operation" J. L. Brown, master mechanic Dallas Railway & Terminal Company, emphasized that without full co-operation of all departments maintenance costs cannot be kept at a minimum.

MAINTENANCE DATA PRESENTED

On the second day the program started with a paper by J. H. Squires, machine shop foreman Georgia Railway & Power Company, on "Shop Practices on Wheels and Axles." This aroused unusual interest and created considerable discussion concerning methods of machining and assembling wheels and axles. A. J. Naquin, engineer rolling stock and shops New Orleans Public Service, Inc., read a paper on "Advantages of Overhauling Equipment on a 40,000-Mile Basis." Abstracts of these papers are given on another page.

COMING MEETINGS

OF

Electric Railway and Allied Associations

***Feb. 7-10*—American Institute of Electrical Engineers, annual convention, Engineering Societies Building, New York City.**

***Feb. 18-19*—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.**

***March 4*—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

***April 26-29*—Southwestern Public Service Association, convention, New Orleans, La.**

***Oct. 3-7*—American Electric Railway Association, annual convention, Public Auditorium, Cleveland, Ohio.**

AVERAGE MILES PER PULL-IN FOR THE YEAR 1926, SOUTHERN PROPERTIES

	Total	Chargeable to Equipment
New Orleans	100,833	261,084
Nashville	45,000	118,724
Knoxville	32,524	54,046
Atlanta	25,991	41,340
Little Rock	15,848	23,389
Birmingham	13,964	17,531
Texas Electric	12,058	15,829
Memphis	9,889	14,337
Mobile	8,633	13,029
Dallas	6,954	10,416
Covington	5,686	16,707
Montgomery	2,865	3,211
Chattanooga	1,920	2,750

COMPARATIVE MAINTENANCE COST OF EQUIPMENT PER 1,000 CAR-MILES FOR YEAR 1925, AND FIRST ELEVEN MONTHS OF 1926

	1925	1926
Memphis	$17.94	$16.16
Little Rock	18.90	16.32
Covington	19.32	18.75
Atlanta	21.54	20.24
New Orleans	19.78	20.37
Knoxville	22.28	20.56
Texas Electric	23.41	20.86
Mobile	27.80	24.80
Birmingham	25.42	25.25
Dallas	31.43	29.74
Chattanooga	30.37	33.08

C. B. Tutwiler, general foreman Memphis Street Railway, spoke on "Car Cleaning." He told how the cars are washed outside every three days with a Holcomb 4-in. bristle brush and clear water. At the same time the windows are cleaned inside and the dust removed from the lamps and interior woodwork with a soft cloth. After each car has finished its daily run, the interior is disinfected and the floor swept. Accumulation of dust is removed from the seats by means of a feather duster.

A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company, Birmingham, Ala., spoke on "Good Housekeeping." He stated that with the shops and carhouses properly cleaned and maintained it is much easier to require better work from the men and to furnish the public with clean and serviceable cars.

The afternoon session was devoted to discussion of 36 questions prepared by member companies pertaining to equipment maintenance. Charts were distributed at the meeting showing the average miles per pull-in and maintenance cost per 1,000 car-miles for the year of 1926. These figures are given in accompanying tables. In the evening the delegates attended a banquet in the Louis XVI dining room of the Peabody Hotel.

The report of the nominating committee, election of officers, appointment of committees, and an inspection of the Memphis Street Railway and Memphis Power & Light Company's properties occupied the morning of Jan. 28.

New officers of the association elected for 1927 are as follows:

President, W. H. McAloney, superintendent of equipment Georgia Railway & Power Company, Atlanta, Ga.

Vice-president, R. M. O'Brien, superintendent of equipment New Orleans Public Service, Inc.. New Orleans, La.

Secretary, A. Taurman, superintendent of equipment way and structures Birmingham Electric Company, Birmingham, Ala.

It was decided to hold the twelfth semi-annual meeting of the association in Atlanta, July 27-29.

Improvements Made in Car Equipment Apparatus*

By C. J. Axtell

Special Railway Engineer
General Electric Company

Car equipment apparatus is a comprehensive subject, and the most interesting phase is that dealing with recent improvements. Changes made in the K-35 controller are typical of the improvements in other controllers of this class. The back casting has been changed to include a vertical trough up the back on each side to provide sufficient room to install the largest size of motor cables. This shortens the time necessary to change a controller. The cable terminals are a flat flag type in which the cables are permanently soldered, and fastened to the finger bases by a cap screw.

Contacts of the cutout switch have been reinforced by heavy flat springs, increasing the capacity of the switch and eliminating troubles due to poor contact and overheated switches. Where the insulated hexagonal shaft is used, the insulation is molded on. It is now molded in hexagonal tubes which accurately fit the standard shaft and can be easily renewed, by dismounting the cylinder castings and replacing the damaged insulation with a new piece. Reverse fingers, having a flat phosphor bronze spring and a heavy copper contact tip, insure decreased burning at the segments.

All modern K controllers with individual finger blowouts are now provided with arc suppressor plates inserted in the arc chute between the deflectors. This plate consists of a specially molded part of arc resisting compound which partially closes up the arcing space and directs the arc through two narrow slots. The older lock type burning tips are replaced with a lap type or one in which the segment screw passes through a hole in both the segment and the burning tip so that it cannot loosen up and drop off the segment as might be possible with the old style.

Cap plates are now made with provision for mounting the LB control device without any machining operations. K-35 controllers furnished with cast aluminum alloy back and cap plates reduce the weight of the controller 19 per cent.

A new type of line breaker known as the DB-986 and DB-987, consisting of a very efficient arc rupturing contactor, magnetically operated and an overload relay inclosed in a box for under car mounting has been developed. This operates to break the motor circuit when normally turning off the controller as well as rupturing overloads and short circuits.

Among the recent improvements is the arrangement for removing the complete arc chute without the use of tools, simply by raising it up to unhook the top and withdrawing the chute, when the entire mechanism and the contact tips are exposed for inspection. The overload relay also has the novel feature of not only opening up the control circuit of the contactor, but also of mechanically opening the contact tips.

The early use of the line breaker provided for the breaking of the arc when the controller was turned to the off position. The ratchet switch improved this operation by requiring that the controller be turned backward but one step in order to open the line breaker. However, to improve further this operation the line breaker control device was developed. It is mounted on top of the cap plate. This permits the addition of this handle to any of the recently manufactured controllers, without the necessity of taking out the cylinder, changing the bearings or mounting any apparatus on the shaft. This breaker has the great advantage of opening up the control circuit of the line breaker on a slight backward movement of the controller handle and before the main cylinder has started to turn off.

With the advent of the new lightweight car, a new controller was needed which controller should be small, light weight and low in height. The K-75 controller was designed to fulfil this need. It has a capacity for operating four 50-hp., 600-volt motors. The contact tip is renewable by removing one cap screw. The arc chute is hinged to swing to the right instead of to the left, thus exposing for inspection all the fingers, blow-out coils and main cable connections when the arc chute is opened. Resistors used are in four sections, assembled in one group instead of with two groups as with the K-35 controller. The controller has five points in series and three points in parallel. A single motor cutout switch provides for cutting out two of the motors and permits operating the remaining pair in series-parallel relation instead of in series only.

For some classes of service a remote control is desirable. For this purpose a new type of magnetically operated control, known as the "Light Weight type M" has been produced. It is intended principally for the city or light interurban service as it has a capacity for four 60-hp., 600-volt motors. The motor controller, which handles all of the main motor connections except the reversing of the motor fields, consists of a contactor box with eight contactors, one of which functions as a line breaker.

A split cover on this box when removed permits the controller inspector to have ready access to all contacts, main terminals and control connections. The reverser has a cylinder similar to a standard K controller. This control has a hand acceleration, viz., it is governed by the movement of the master controller, for its five steps series and four steps parallel. But nine train wires are required for operation. Due to the modern designs incorporated the control current has been reduced to less than one ampere.

The US-20-A trolley base, like its predecessor the US-13, has four tension springs adjusted by a single screw and provides for fastening the pole by means of a clamp held by two bolts. The bottom of the base is flat, eliminating the necessity of recessing any projection in the wood platform. Instead of a series of long small rollers, this base has two sets of short tapered rollers, set in accurately machined raceways which are provided with very liberal grease reservoirs. Two pipe plugs afford easy means of filling oil to taper roller bearings and to pole socket axle pin reservoirs. A trigger lock can be actuated to secure the trolley poles socket in a lowered position for changing poles.

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*Abstract of a paper presented at a meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at Memphis, Tenn., Jan. 26-28.

Stepping on It*

By Ray S. Frehse

Sales Engineer National Pneumatic Company

Unquestionably the electric railways are "stepping on it." They are traveling at accelerated speed along lines of modern progress. In fact, within the last few years they have done more to attract car riders and provide an improved service than during any other time in railway history. The trend is as apparent in the South as in any other section of the country. It is a trend which clearly points toward the use of modern cars. By modern cars, I do not merely mean new cars. New cars are not necessarily modern.

The modern car is the car equipped with every essential and modern device for increasing safety, speed and comfort. It is the car constructed with luxurious seats and finely finished interiors. It is equipped with motors which assure fast acceleration and high running speeds. It is provided with modern air brakes, assuring quick stops and the safety of the riding public.

It must also be a car equipped with the most modern loading and unloading apparatus. If safety, speed and comfort are established as essential, there is surely no consideration more important than the problem of passenger interchange. If this problem is overlooked—if proper door and step control equipment is not provided—all other advantages of modern equipment may be easily offset.

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*Abstract of a paper presented at a meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at Memphis, Tenn. Jan. 26-28.

No matter how quickly a car accelerates or decelerates, no matter at what rate of speed it travels between stops, the gain in schedule speed is largely wiped out if excessive standing time is required to load or unload passengers at every stop.

Since the first inclosure of car platforms, there has been a decrease of 8.7 per cent in boarding and alighting accidents. This is based on the reports of 175 operating companies.

The eyes of the industry today are turned toward the operation of one-man cars. The automatic treadle door is an exit door operated by a pneumatic engine and controlled by a treadle plate set flush with the car platform. This system of controlling exit doors—by permitting passengers themselves to step on a treadle plate—has proved a boon to one-man operation. It has solved the loading and unloading difficulties encountered in the original type of one-man car.

While the first small type of one-man car made a decided cut in operating expense, it somewhat slowed up scheduled speeds due to the small door at the front of the car through which boarding and alighting passengers must pass. This caused considerable congestion at the door as well as unnecessary friction in the aisle and on the street. With such an arrangement, moreover, it was impossible to operate one-man cars in the cities below the Mason-Dixon line where a special law calls for separate exits for white and colored people. To eliminate this unsatisfactory condition a few properties provided two doors at the front of the car—one for an entrance and the other for an exit. While this helped to relieve the congestion of boarding and alighting passengers passing through one door, it did not eliminate the aisle friction nor keep the short-haul rider from standing near the front door, causing an unevenly distributed load.

The next step, however, was one in the right direction. It started the circulating load method of operation in one-man service. One or two properties installed at the rear of their one-man cars, a pneumatically operated door controlled by the operator on the front platform. The objection to this method of operation was that the door was open much longer than required for passengers to get off. It thereby invited the non-paying rider to use this door for his entrance. In cold weather, moreover, a considerable amount of heat was wasted. The greatest objection, however, was the fact that it was possible for the operator to close the door at the wrong time, catching the outgoing passenger in the door and thus leading to accident claims and delays in service.

The development of the automatic treadle door makes it possible to use the circulating load in one-man operation with these objections entirely avoided. Both the center-exit type car and the car with platforms front and rear lend themselves to this method of controlling pasengers in one-man service. The front entrance and center-exit type car is usually arranged with double front doors for rapid loading, while both center doors are equipped with treadles for rapid unloading. Where cars of this type are run through congested areas and where the loading is apt to be heavy at certain corners during peak periods, a street faretaker's valve is provided for one of the exit doors so that passengers can be loaded at both the front and center doors.

The car with end platforms can be arranged in several ways, depending entirely upon conditions. The small single-truck car, for instance, which is generally used on lines having light traffic, is most frequently equipped with a single entrance door at the front and a single exit door of the automatic treadle type at the rear. If conditions warrant it a faretaker's valve can be provided for rear loading.

On the larger double-truck cars it has been found that an entrance and an exit on the front platform are desirable in addition to the exit at the rear. It has also been found that a treadle for the front exit has the same advantages as the treadle used at the rear.

In some cases where the cars are used to handle extremely heavy traffic, it has been found necessary to have two doors on the rear platform. One is the treadle exit door, and the other is an entrance door controlled from the street faretaker's valve on the outside of the car. If, at times, it is thought desirable to use this same car in two-man service, a conductor's valve is provided so that the door can be controlled by him from the inside of the car. This latter arrangement provides for either one-man or two-man operation and, as it can be used with equal facility in either type of service, it constitutes a highly flexible unit.

In fact, more than 4,500 of these treadles are now in use on cars operated in some half a hundred cities. These cars are traveling nearly 9,000,000 car-miles every 30 days.

Considerable thought and attention should be given to the construction of the car in and around the doors so that the best possible condition for installation of the door-operating mechanism is obtained. Faulty car construction at the doors will cause poor door operation, high maintenance, excessive wear and frequent adjustments. If the equipment is installed so it is accessible for inspection it is often found that employees will not trouble to keep the equipment in first-class condition.

Wheel and Axle Maintenance at Atlanta*

By J. H. Squires

Machine Shop Foreman Georgia Railway & Power Company, Atlanta, Ga.

WHEN ordering axles we specify a tensile strength of 85,000 lb., and a chemical analysis as per A.E.R.A. standard, E-5-24. Axles are ordered rough turned, of constant diameter, specifying the rough diameter 1/16 in. over the finished diameter. We also specify the finished dimensions as a further check on correctness. The axle is finished all over. In finishing axles we turn to 0.008 oversize at axle bearing and journal bearing seats and roll bearing to correct diameter. We date all axles on end, but no mileage record is kept.

On our modern cars we are using the same axle in three different types of trucks, a total of 170 four-motor cars. This axle is A.E.R.A. standard, 3⅝x7 journal. We have about three types of axle thrust collars; the one we like best in split and held together with four bolts. An adjustable screw is provided to engage against the wheel hub.

We use the standard of 10 tons to the inch diameter in pressing on wheels. The allowance for pressing on cast wheels depends upon the character of the metal. The machine operator sizes this up from experience while boring. This usually runs from 0.003 in. to 0.005 in. There is a difference in allowance for pressing on steel wheels as compared to cast chilled wheels, 0.002 to 0.004 in. being maximum allowance necessary to get tonnage required on steel wheels. White lead is used in pressing on.

Wheels are centered by measurements from the end of the axle to the wheel hub. We press wheels to wheel gage 4 ft. 8¼ in., and then press until the gage is loose. This checks tight on high spots on the flange. Track gage being 4 ft. 8½ in., this gives ¼ in. lateral tolerance. It is assumed, of course, that the wheel-gage line is ¼ in. up on the flange fillet.

The wheel gage is applied at three locations on the wheels to check for warped wheels or spring axle. We find we will need some new wheel gages before long and probably will make them to 4 ft. 8 5/16 in. as recommended in the 1926 Proceedings, and our wheel gage, allowing a tolerance of 1/16 in. under, will be as a minimum 4 ft. 8¼ in.

Cast wheels and a few rolled steel wheels are used on city cars. Our cast wheels are 2¾ in. tread, ¾x1 1/16-in. flange. On our cast wheels we aim to get about 31,000 miles on 26-in. wheels and 40,000 miles on 33-in. wheels. We find, however, that on an average we do not quite reach this.

Discarding of wheels is first determined by the judgment of the carhouse foreman, and verified by the general foreman and machine shop foreman. The criterion for removing wheels is soft iron spots appearing through the chill. For city work on cast chilled wheels we do not have a flange limit gage.

As stated before, we do not attempt to keep a mileage record on axles, and discard them only on limitation of wear. Interurban car axles are removed from that service after seven years and placed in city service. The hammer test is given to all axles each time a car comes in for wheels. Limitations of wear gages are then used, which are ⅛ in. undersize on the axle bearing seat, and ¼ in. undersize on the journal bearing seat. Axles are not built up except worn buttons on the ends. When the axle becomes undersize it is turned to the next smaller size.

We have a number of maximum traction trucks, and a few trailers. When an axle becomes too small to use as a motor axle it is turned down to a trailer axle or an idler axle for maximum traction trucks. When an axle is of sufficient diameter for this purpose, but is not long enough, we make two axles out of three; cutting two pieces to sufficient length, a hole is bored in the end of each one and a piece of 1-in. round cold-rolled steel is inserted. Axles are then put together, chamfered, and electric welded. The weld comes about 36 in. from end of axles. We have been following this practice for about three years and have not had a failure.

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*Abstract of a paper presented at a meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at Memphis, Tenn., Jan. 26-28.

Overhauling on a 40,000-Mile Basis*

By A. J. Naquin
Engineer Rolling Stock and Shops
New Orleans Public Service, Inc.

BRIEFLY, this inspection system consists of removing motors, line breaker, circuit breakers, and air compressor from a car that has operated approximately 40,000 miles since its purchase or last inspection; replacing them with units that have previously been put in A-1 condition, and at the same time checking over all car wiring, air piping, brake rigging, door mechanism, trucks, and minor units (such as trolley poles, harps and wheels); replacing or rebuilding everything that is needed to place the car in as good a condition as the day it was first placed in service. A car is held out of service only a fraction of the time that would be required to repair and replace original equipment.

Inspection is carried on under the supervision of a shop foreman and a field engineer. The latter makes all electrical tests, such as resistance measurements, "hi-potting," and motor "running-in" tests. The dipping and baking of armatures and field coils is under his supervision, and all assembled motors must bear his stamp of approval before being placed on a truck under a car.

Resistance measurements are made with a Kelvin bridge ohmmeter. "Hi-pot" tests are made with portable Westinghouse variable voltage transformers which have been built into a convenient testing set. A testing set has been constructed for calibrating line and circuit breakers. Another testing set has been built for the "running-in" of all assembled motors. A complete load testing set is under the process of construction. An air-brake testing outfit is also provided for the testing of air compressors, governors, etc. Babbitt and "half and half" solder temperatures are thermostatically controlled by means of Leeds & Northrup potentiometers. Baking oven temperatures are controlled by Taylor Instrument Company's apparatus in conjunction with a Westinghouse switchboard layout. A small tank filled with hot Oakite solution is used for cleaning motor bearings. All truck parts and other units are thoroughly cleaned before any squaring and tightening up is attempted.

Advantages of such an inspection system are shown by the record of rewound armatures. In 1923 and 1924 there were 201 and 148 wound respectively, as compared with 55 and 36 in 1925 and 1926. That is, a total of 349 against 91. The total number of motors in service is 1,100. New fields used during 1923 and 1924 totaled 473, compared with 123 in 1925 and 1926.

A reduction in personnel in the assembly room was effected when the system was first put into operation. During 1923, six armature and field winders were used. This number was reduced to four in 1924, and further reduced to three in 1925, at which figure it was maintained during the past year. Four armature and field winder's helpers were employed in 1923. Three were used in 1924, two in 1925, and this past year only one helper and one apprentice were needed. This reduction in labor has been partly accomplished by efficient assembly room management. Efficient tools and equipment account for a further allowable reduction, and the quality of the work done since the system was started has permitted this reduced force to maintain its schedule of operation.

A steady reduction in the number of pull-ins chargeable to equipment is being made. This is due to the inspection system having raised all equipment to a more reliable operating condition. Maintenance cost has been reduced to a figure that compares favorably with like costs throughout the country. For the past year our cost was $20.39 per thousand car-miles. It is desirable to have maintenance charges low, but improved service should always be given consideration even at slightly increased cost.

American Engineering Council Meets in Washington

PRESENTATION and adoption of a definite legislative program covering public works was one of the chief events of the two-day annual meeting of the American Engineering Council held in Washington on Jan. 13 and 14 of this year. The council indorsed the public works measure to be introduced in the House by Representative Adam M. Wyant of Pennsylvania. This bill embodies the essential features of the report of the council's special committee, adopted a year ago, providing for the reorganization and the more effective co-ordination of the public works function of federal government.

A safety and production study made by a committee of the council is nearing completion. While the conclusions have not all been formulated, members of the committee announced one of the important findings: "In practically every industry studied, an upward tendency in productivity is accompanied by a downward tendency in accident frequency." A. W. Berresford, Detroit, is chairman of this committee.

Another report is rapidly being completed by the council's committee on street signs, signals and marking, W. B. Powell of Buffalo, chairman. Co-operation of numerous national agencies has been obtained. The aim of this investigation is to prepare a standard code of street and highway markings that will appeal to various communities.

The meeting terminated with a banquet, at which Charles M. Schwab, president American Society of Mechanical Engineers, and Secretary Herbert Hoover of the Department of Commerce were guests of honor. Both Mr. Schwab and Mr. Hoover delivered notable addresses.

Minority Only Benefits by Parking†

By John A. Miller, Jr.
Associate Editor Electric Railway Journal

ELIMINATION of parking on Fifth Avenue, New York City, during the recent subway strike resulted in an increase of more than 50 per cent in the speed of vehicular movement between 32d and 52d Streets. On June 17 the writer found by careful investigation that the average speed of northbound private automobiles in this area between 3 p.m. and 6 p.m. was about 4.3 m.p.h. On July 28 with anti-parking regulations in effect a second check showed an average speed of approximately 7.2 m.p.h. Other conditions on these two dates were so similar that the elimination of parking must receive the major part of the credit for the improvement.

It has been stated that the capacity of streets is determined by the intersections. That theory is only partly true. The elimination of all crossing movements at grade, of course, would increase greatly the capacity of any street. But such elimination is a dream of the future. For the present we must permit cross movements, and the problem is to move the greatest possible amount of traffic during the period that the intersection is open.

If vehicles move across an intersection in six lines instead of four, the number crossing in a given time is increased 50 per cent. That was what happened on Fifth Avenue when parking was eliminated. On the day when the second of the two checks already referred to was made northbound vehicles crossed the 42d Street intersection in three lines, while on the first day they crossed in only two lines. The same space was available at the intersection on both occasions, but on the earlier date automobiles parked along the curb between 42d and 43d Streets created a bottleneck on the far side of the crossing.

Undoubtedly much can be done to improve traffic conditions at street intersections. The full width of the roadway should be available for moving traffic. Left-hand turns prevent the most efficient utilization of space at an intersection and should be prohibited at heavy traffic points. Cutting back the corners to permit vehicles to turn on a longer radius while yet hugging the curb might prove advantageous in many places. Better control of pedestrian movement certainly would help. All this, however, will do little good if the roadway space between intersections is not used to the best advantage—a condition that does not now exist.

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*Abstract of a paper presented at a meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at Memphis, Tenn., Jan. 26-28.

†Abstract of discussion published in February Proceedings, American Society of Civil Engineers, page 270.

The argument has been advanced that elimination of parking will not create an additional traffic lane because a certain number of vehicles will always be stopping along the curb to pick up or discharge passengers. This argument assumes that these vehicles are now drawing up close to the curb, but such is not the case. Often a solid line of parked automobiles renders the curb inaccessible. Consequently vehicles picking up or discharging passengers stop in a second line in the middle of the roadway. Thus the elimination of parking will actually create an additional lane for moving traffic despite the necessary stopping of occasional vehicles.

It cannot be denied that there is some curtailment of the rights of the individual when parking is restricted, but restriction of individual rights for the common good has been practiced since the beginning of civilization. The no-parking rule is only a new example of a well-established principle. Most cities have forbidden sidewalk obstructions. Today's protest becomes absurd tomorrow. If more people benefit by regulation than suffer thereby, it is clearly justified. Of this the public and not the individual must be the judge.

From all available evidence it appears that the beneficiaries of parking restriction would far outnumber the sufferers. A careless assumption often is made that nearly every one has an automobile and wants to park. The fact is that only a small fraction of the users of the public streets ride in private automobiles. Investigations made by the writer concerning traffic conditions on Fifth Avenue, New York, showed six times as many passengers riding in public transportation vehicles as rode in private automobiles. Traffic checks made elsewhere show similar conditions. Even in Detroit, the greatest automobile manufacturing center in the world, more than three-quarters of the users of the streets ride in public transportation vehicles. Figures from a few typical cities are given below:

PASSENGERS CARRIED BY PUBLIC AND PRIVATE VEHICLES

	Public Transportation Vehicles	Private Auto	Per Cent by Private Auto
Fifth Avenue, New York City	19,224	3,220	13.9
Broad and Market Streets, Newark	38,000	6,000	13.6
Business district, Detroit	57,150	18,281	24.1
Business district, Baltimore	58,859	12,509	18.1
Business district, St. Louis	69,768	17,601	20.1
	243,001	57,611	19.2

An even smaller proportion of private automobilists is shown by investigation made to determine the means of transportation used by customers to reach retail stores. Of 426,688 customers checked at 71 stores in various cities only 153 per cent came by private automobile. Results of these counts are shown in the following table:

MEANS OF TRANSPORTATION USED BY STORE CUSTOMERS, PEDESTRIANS NOT INCLUDED

City	Number of Stores	Public Transportation Vehicles	Private Automobile	Per Cent by Private Automobile
New York, N. Y.	13	34,439	813	2.3
Chicago, Ill.	4	13,549	1,680	11.0*
Detroit, Mich.	27	158,801	36,272	19.1
Cleveland, Ohio	22	69,419	20,313	22.7
Baltimore, Md.	3	38,433	1,712	4.3
Brooklyn, N. Y.	1	28,800	2,640	8.4
Los Angeles, Cal.	1	17,759	2,058	10.4
	71	361,200	65,488	15.3

*Customers questioned in this investigation were specially selected as being of a type likely to have come by automobile.

Not all of the users of private automobiles are parkers. Many are en route and do not wish to stop. Possibly this is why the store counts show a smaller percentage of automobilists than do the street counts. Many others leave their automobiles in garages. It is difficult to tell exactly what proportion of the users of private automobiles actually are parkers. Figures on this phase developed by the four Chicago department stores mentioned in the preceding table show 452 automobiles parked free in public streets as compared with 369 using paid storage space. It is safe to say that not one person in ten really profits by the parking privilege.

No one has suggested that elimination of automobile parking on important streets offers a complete solution of the problem of traffic congestion. But experience has shown conclusively it does afford relief. It can be done at once. The cost is practically nothing. A large majority of the public will benefit by the greater amount of roadway space available for moving traffic.

American Association News

Engineering Executive

BUSINESS of importance was transacted at the second meeting of the executive committee of the Engineering Association held at association headquarters, New York, on Jan. 26. Members present were President Daniel Durie, R. H. Dalgleish, F. H. Miller, W. F. Graves, W. W. Wysor, L. D. Bale, C. H. Jones, P. V. C. See and G. C. Hecker representing J. W. Welsh.

The secretary announced that the finance committee of the American Association approved appropriations for the committees on noise reduction and rail corrugation. It was voted to request the finance committee to approve an appropriation for use in the trolley wire tests being conducted by the committee on power transmission and distribution.

An affirmative vote was cast by the executive committee on the proposal to charge individual members $1 for copies of the annual proceedings, it was announced. Another ballot of the executive committee unanimously approved the formation of two special rolling stock committees, one to review the association's standard journal boxes and the other to establish limits of wear on car equipment.

Several proposals of the way and structures committee were acted on. It was voted to make changes suggested in Manual section W108-23 to bring it into conformity with the American Railway Engineering Association specification for plain bolted special trackwork. In future, it was agreed that wherever a drawing or specification of some other national organization is referred to in the Manual but not included, copies of such drawings or specifications may be obtained at nominal price on request to the executive secretary. It was voted that the proposal to publish the Manual in sections corresponding to the various engineering departments be held in abeyance.

It was voted to make suggested changes in sections W106, W107, W108 and W109-23 be made in the 1926 Manual provided the Manual committee approves. It was voted to combine way and structures special committees Nos. 2 and 5 into special committee No. 2—special trackwork, the personnel to consist of the present membership of the two committees.

For the Manual committee Mr. Dalgleish reported that copy for the 1926 Manual had been approved and sent to the printer. The secretary suggested the printing of 1,000 copies, of which 500 would be bound, the remainder being held for stock and for making paper-bound sections. This action was approved.

Mr. Miller stated that the subjects committee had no report to make. It was proposed to send out letters to all committee chairmen in the near future requesting them to circularize their members for suggestions regarding new subjects. For the rules committee, he reported that the existing rules had been studied, after which a meeting was held on Jan. 24 and 25 at which a draft of the proposed regulations was unanimously agreed upon. He submitted the report of the committee, containing recommendations in favor of a unit method of voting on standards and a letter ballot instead of the oral vote on the convention floor. The proposals were carefully reviewed and unanimously approved by the executive committee as corrected and amended. It was voted that the president be instructed to report to the American executive committee the action taken. If approved the Engineering Association will appoint a committee to make a careful study of plans which might be used for a unit method of voting.

President Durie presented a suggestion that the engineering committees might incorporate in their reports each year a tabulation of improvements and new devices needed by the industry which have not been developed, and that such information be compiled in a pamphlet for distribution among the manufacturers. The suggestion was favorably received and Mr. Durie was asked to see if the proposal could be put in more definite form.

Mr. Dalgleish, chairman of the special committee to co-operate with the United States Department of Commerce, reported on a number of projects along the lines of simplified practice. The recommendation on carbon brushes and brush shunts was approved.

A.E.S.C. PROJECTS

Several American Engineering Standards Committee projects were reported by the secretary, and a number of appointments were announced. J. M. Hipple represented the association at a conference on standardization of electric motors, and stated that a sectional committee on this subject was authorized. W. E. Brown was appointed on the sectional committee on wood poles, vice Leslie E. Delf, resigned, with H. E. Brauning as alternate.

F. L. Aime was appointed on the committee on terminal markings vice C. A. Greenidge, resigned. Announcement was made of the formation of a sectional committee on standards for graphical presentation. H. W. Codding was named as the association's representative. A sectional committee on methods of test of road materials was organized. Proposed federal specifications for chrome yellow and for Portland cement were referred to A. T. Clark and H. H. George, respectively.

The executive committee was advised that the specification for tubular steel poles prepared under the sponsorship of the A.E.R.A. had been approved and printed in the standard form for the A.E.S.C. Copies are available at association headquarters at a nominal price.

A.S.T.M. SPECIFICATIONS

The secretary announced that an attempt was being made to have the American Railway Engineering Association bring its specifications for the manufacture of open hearth girder rails of plain, grooved and guard types into complete conformity with those of the A.S.T.M. and the A.E.R.E.A. so that at the proper time a specification might be presented to the A.E.S.C. Only a few minor changes are needed to do this.

Announcement was made that Mr. Hecker and Mr. Bale as representatives of the association had attended a meeting of the power house committee of the N.F.P.A. at which a start was made in the formulation of rules for protection of electric power houses. A conference committee on electric railway car houses and cars has been organized to consider in particular regulations for hot water and hot air heaters, composed of H. H. Adams, chairman; J. H. Lucas and H. S. Williams.

A joint meeting of the conference committee on bus garages and garage hazards was attended by Mr. Hecker, at which a proposed set of regulations for bus garages was drawn up for further consideration.

A. J. Scaife and L. H. Palmer of the Society of Automotive Engineers have accepted apointment as representatives of that society on rolling stock committee No. 2, motor coach design.

L. D. Bale, W. E. Bryan and H. W. Codding of the A.E.R.E.A. have been suggested to the American Institute of Electrical Engineers for membership on the committee on switchboards for power and light.

The secretary announced the resignation of M. B. Rosevear from the A.E.S.C. sectional committee for the revision of the National Electrical Safety Code, parts 2 and 4. His resignation was accepted with regret and the president was authorized to appoint a successor.

The need for revision of the constitution and by-laws was discussed. Changes may have become necessary on account of the new organization and procedure. The president was authorized to appoint a sub-committee to investigate the need for such revision.

Claims Executives

PLANS for the October meeting of the Claims Association were made by its executive committee at a meeting held in the offices of the Memphis Street Railway on Jan. 28. Those present were: President C. B. Proctor, Memphis; W. F. Weh, Cleveland; B. F. Boynton, Portland, Ore.; W. R. Robinson, Cincinnati; G. T. Hellmuth, Chicago; S. J. Herrell, Knoxville; L. F. Wynne, Atlanta, Ga.; H. V. Drown, Newark, N. J.

It was proposed to include in the program for the annual meeting a number of papers showing the actual accomplishments of electric railways in accident prevention work. Medical and surgical work are also to be given a place on the program, and a joint session is planned with the Transportation and Traffic Association, as has been customary with this group in recent years.

Mr Proctor exemplified his Southern hospitality by entertaining the early arrivals with drives around the city of Memphis. He was also host at a dinner given the executive committee at which officers of the Memphis Street Railway were present.

Further details of the program will be taken up at a later meeting of the executive committee of the Claims Association.

Heavy Electric Traction

ORGANIZATION of the heavy electric traction committee of the Engineering Association was completed at a meeting held at association headquarters in New York on Jan. 27. Those present were H. F. Brown, New Haven, Conn., chairman; J. M. Bosenbury, Springfield, Ill., vice-chairman; A. H. Armstrong, Schenectady, N. Y.; Morris Buck, New York City; H. W. Cope, Pittsburgh, Pa.; A. H. Daus, Chicago, Ill.; J. C. Davidson, Schenectady, N. Y.; E. P. Chase representing J. V. B. Duer, Altoona, Pa.; M. W. Manz, Mansfield, Ohio; G. C. Hecker representing J. W. Welsh, New York City, and F. H. Miller, Louisville, Ky., sponsor.

Assignment of subjects to the various sub-committees was the principal business of the meeting. In addition to the subjects assigned by the association, it was decided to continue the collection of data on electrified steam railroad mileage and electric locomotives.

It is planned to hold the next meeting of the committee in New York City during April.

Special Reports Available

SPECIAL reports are being prepared by the Bureau of Information and Service of the American Electric Railway Association and will be available to member companies upon request, as follows:

Bulletin No. 124. Motor Bus and Truck Rules and Regulations Prescribed by Public Utility Commissions.—A collection of all the orders issued by the regulatory commissions of the various states, prescribing rules and regulations for the operation of buses and trucks in common carrier service, with an analytical index permitting ready reference to subjects covered by the orders. The orders cover such subjects as size and weight restrictions on buses and trucks, standard equipment prescribed, liability bonds and insurance requirements, rules for making applications for certificates of convenience and necessity, requirements for drivers, etc.

Bulletin No. 125. Relief from Paving Burdens.—An up-to-date review of the developments in the movement to obtain relief from state and municipal requirements to pave, repave or maintain the pavement along the electric railway's tracks, with accounts of leading cases in which relief has been obtained. All of the data contained in the previous bulletins on this subject have been brought together in this bulletin, and a careful index has been prepared covering all cases of paving relief.

Bulletin No. 126. Trend of Trainmen's Wages, 1927.—Shows for a large group of companies the maximum wage rate paid trainmen, the number of years of service necessary to reach this maximum, and the number of trainmen employed for each of the years from 1914 to 1926, inclusive, and also the rates paid as of February 1, 1927.

Bulletin No. 127. Trend of Electric Railway Fares, 1927.—Shows the rate of fare in effect in all cities having a population of 25,000 or more for each year from 1917 to 1926, inclusive. In addition, it shows the average cash rate of fare in 272 cities during the same years, and also the number of cities in which each rate of fare was in effect in each of these years.

In addition to the above the following supplements have been prepared, bringing the information they cover down to February 1, 1927.

Supplement No. 17 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 4 to Bulletin No. 108, Wages of Trainmen.

Supplement No. 4 to Bulletin No. 109, Wages of Bus Men. Cost of Living Studies (Bulletin No. 128).

The News of the Industry

New St. Louis Fare Schedule Suspended

The Missouri Public Service Commission on Feb. 3 suspended until June 7 the fare schedule of the United Railways, St. Louis, Mo., under which the company proposed to raise its fare from 7 cents to 8 cents or two tokens for 15 cents, effective on Feb. 6. T. E. Francis, counsel for receiver Rolla Wells, states that the federal court will be asked for an order setting aside the commission action and permitting the proposed rate to go into effect. An appeal will be based on grounds that the present fare schedule is confiscatory and in violation of the constitution.

Seattle Warrants to Be Cashed Without Discount

Upon showing by the City Council of Seattle, Wash., that the salary warrants of the employees of the Seattle Municipal Railway will be cashed without discount, Judge Calvin S. Hall in the Superior Court has continued argument of J. G. Von Herberg's application for a restraining order in his suit against the city until Feb. 7. Mr. Von Herberg is asking for an order restraining the city from making further payments on the railway purchase until operation costs are paid. The court stipulated that while he granted the city's request for non-interference at this time, the money now in the bond redemption and interest fund must remain in the jurisdiction of the court. Meanwhile, the $118,000 payroll warrants paid to employees on Dec. 26 have been cashed, either at the banks or department stores of the city, without discount.

Mayor Bertha K. Landes presented to the court an affidavit setting forth efforts made to obtain a revision of the purchase contract with the Puget Sound Power & Light Company, and submitted a telegram from A. W. Leonard, president of the company, who is en route West from a meeting of the Stone & Webster directors, with a proposition to present to the city in regard to the railway contract.

Corporation Counsel T. J. L. Kennedy pleaded for a policy of non-interference, pointing out that the railway will be off the warrant basis by May 20, a period of five months and four days. He accused Mr. Von Herberg of being an enemy to "both laborers and taxpayers."

Attorney for Mr. Von Herberg told the court the action was brought in good faith and questioned the authority of the city to issue interest-bearing warrants when there is no money in the warrant fund. He called attention again to the statute which says labor must be paid first. He declared the power company is not interested and not properly a party to the suit, as it has assigned its bonds. He also criticised the payment of damage claims of the railway out of the general fund, saying they should come from the railway fund.

Seattle's "Fourteen Taxpayers," who in 1922 protected the city's general fund from invasion by the Municipal Railway, came back into the situation when Judge Hall granted them permission to appear as "friends of the court" in the Von Herberg suit. It is declared that the taxpayers have resolved to back the Von Herberg suit on the ground that labor and operating expenses, under the law, must be superior to bond redemption.

Chicago Grants Expire; $171,188,000 Bonds Defaulted

Situation Affecting Chicago Surface Lines Reviewed as Matters Stood on Day of Expiration of Old Franchises—Slow Progress of New Negotiations—Coach Company Renews Its Bid

FRANCHISES granted twenty years ago to the four companies which comprise the Chicago Surface Lines expired at midnight on Jan. 31. Simultaneously the six months extension ordinance voted by the City Council on Jan. 26 became effective, thus assuring continuance of unified operation with the same rate of fare, universal transfers and the same compensation to the city.

While the change does not affect street car riders, holders of the companies' securities are denied the principal now due them. Interest on all of these securities was paid this week, but payment of the principal will have to await agreement on a new franchise. The aggregate default of the railways' securities—probably the largest in the history of the industry—will be $171,188,475, approximately $102,000,000 of which represents Chicago Railways obligations. This default has been anticipated ever since it was known there would be a delay in agreeing upon a new franchise for the companies.

About 50 per cent of the Chicago first mortgage bondholders are reported to have placed their securities in the hands of a protective committee.

Actual demand for the payment of $55,655,000 first mortgage gold bonds was made within ten hours of the expiration of the franchise period upon the Chicago Railways by the Harris Trust & Savings Bank, acting as trustee. In announcing the default, the company replied that it was in the hands of receivers. Holders of $40,000,000 worth of junior bonds of the company, consisting of consolidated mortgage bonds, series A and B, purchase money mortgage bonds and adjustment income bonds, which also fell due Feb. 1, met the same answer when payment was demanded the following day.

The receivers for the company have declared their intention of joining with the Harris Trust & Savings Bank and the first mortgage bondholders' protective committee in asking the federal court that the first mortgage on the property be foreclosed. It is expected that the protective committee, headed by Albert W. Harris, president of the aforementioned bank, will subsequently institute proceedings for a sale of the property. The Chicago Railways has a valuation of $94,000,000. This will open the way for a reorganization over which the bondholders will exercise strong control. As a reorganization without the franchise power to operate would be of very limited value, the bondholders are also expected to exert a powerful influence in the traction negotiations which were resumed by the local transportation committee of the City Council on Feb. 3.

Holders of the $68,270,000 first mortgage bonds of the Chicago City Railway and the Calumet & South Chicago Railway are apparently satisfied with the situation and no move has been made to apply for a receivership. While there is no money in the treasuries of these companies to meet the demand for the principal sum, interest on the bonds is available and will be paid promptly, according to Leonard A. Busby, president of both companies. The $20,616,000 principal of collateral trust bonds of the Chicago City & Connecting Railways, the third member of the south side group, was defaulted on Jan. 1.

ORDINANCE NEGOTIATIONS DEFERRED

Further consideration of the new consolidation ordinance was postponed on Jan. 29, awaiting action of the Chicago Railways receivers appearing in the federal court to default on their mortgage bonds. In the event of the filing of a bill for the foreclosure of the first mortgage this week, the bondholders will be directly injected into the negotiations and the issue between the city and companies may become more clearly defined. At the instance of President Busby, the Aldermen agreed to defer discussion of the clause in the draft providing for the naming of the local regulatory commission. A commission of five members, all named by the Mayor subject to approval by the City Council, appears to be favored by the members of the committee, while company representatives insist that at least two commissioners should be named by the company and another selected jointly. A bill authorizing Chicago to appoint a commission to regulate, supervise and control its own transit affairs was introduced into the lower house of the state Legislature on Jan. 27 by Representative Michael R. Durso.

The committee tentatively agreed at its meeting on Jan. 29 to relieve the new company of certain non-transportation expenses, including the cleaning of its right-of-way and part of the burden of paving between the tracks.

SUBWAY QUESTION REVIVED

Chairman Joseph B. McDonough announced at the meeting that he would soon ask the committee to order working specifications made preparatory to building subways by special assessment. Steps in this program, according to Mr. McDonough, will be, first, a decision on the kind and size of a supervisory staff; second, a rough estimate of the cost of plans; third, hearing of property owners and other citizens, and fourth, approval of the program by the City Council as a whole. An estimate of six months was placed on the length of time which will probably be required to prepare plans for the subways.

Questions of valuations of the various properties and rates of return, over which a deadlock seems to have been reached, were briefly discussed. Cyrus H. Adams, attorney for the Chicago Rapid Transit Company, said he would be able to offer a valuation of the elevated lines at an early date.

Growing indifference on the part of members of the local transportation committee is regarded as endangering the hope that the consolidation ordinance, many vital clauses of which are still undecided, will be completed and approved by the City Council in time for submission to the voters at the April mayoralty election. With many of the Aldermen coming up for re-election on Feb. 22 it is considered unlikely that much attention will be given to traction matters in the intervening weeks. It has been estimated by Corporation Counsel Francis X. Busch that three solid weeks will be required before the proposed ordinance is ready for presentation to the City Council.

MOTOR COACH HEARINGS RESUMED

The Chicago Motor Coach Company on Jan. 27 renewed its bid for a term franchise to operate comprehensive city-wide bus service. The bus company's proposal has been in the hands of the Council sub-committee since it was first presented to the city on Dec. 9. The Aldermen have been assured that so long as a reasonable return is guaranteed to the company the terms of the ordinance can practically be dictated by the city.

At the hearing during the week ended Feb. 5, called to receive further details of the proposition, James A. Emory, vice-president of Ford, Bacon & Davis, presented the results of elaborate engineering studies together with supporting data, maps and charts showing how the plan would be carried out.

The federal court on Feb. 3 ordered foreclosure proceedings on Feb. 9 against the Chicago Railways, on petition of the Harris Trust & Savings Bank. Friendly action was not contested. The court reappointed the three receivers named last month and ordered the lines operated as required under the city contract. Similar action by the junior bondholders is expected soon. The company has twenty days to reply. A formal hearing will be held in the meantime. The consolidation ordinance hearing has been postponed indefinitely.

Railways Robbed by Tax Collector

Economic retrenchment in New York State should begin in the public school system and the tax burden should be equalized by distributing the levies to protect the electric railways, which "are being robbed." These are the views of John J. Merrill, expressed by him at the National Republican Club in an address on Jan. 26. Mr. Merrill spoke impromptu at New York. Later he talked with the correspondent of the ELECTRIC RAILWAY JOURNAL at Albany on the same subject. The subjoined comment is believed to represent his views correctly:

> Street railroads are taxed to death. They pay a property tax on all properties; they then pay to the state of New York 1 cent on every dollar of gross income they take in; they then pay a special franchise tax for the privilege of occupying public places. They are also paying paving taxes. The average amount taken away from the street railways for paving the streets of municipalities has been in excess of $2,500,000 a year. This is, of course, a relic of the old days when the horse cars actually did some damage to pavement, but that is not so now.
>
> It is true the street railways should pay any expense occasioned by heavier construction needed to carry their rails and for whatever repairs are made necessary by their operation upon them. Today, subject to all these taxes, they are thrown into competition with bus lines which are practically paying nothing, so to speak, toward the support of government; at least it is so slight it is nearly negligible. Of course, incorporated bus lines are supposed to pay a gross earnings tax, but they do not pay any special franchise tax and they have little if any property which gets onto the tax rolls. There is no class of taxpayers in the state so heavily burdened by taxation as the street railways.

Mr. Merrill is regarded as one of the foremost experts in the state of New York on the practical working of the corporation tax law. He has been connected with the tax system of the state since 1894. In November, 1917, he was appointed a tax commissioner by Gov. Charles S. Whitman to fill an unexpired term, and in February, 1918, he was reappointed for a full term. On Jan. 26, 1925, Mr. Merrill was reappointed by Governor Smith for a term ending Dec. 31, 1926, and in January of this year he was again reappointed by Governor Smith as a member of the tax commission for a term of six years.

Mr. Merrill was born at Potter Hill, R. I., on Nov. 14, 1861. He was educated in the public schools, Hopkinton Academy and Alfred University, from which institution he was graduated in the philosophical course in 1884. He received the degree of master of philosophy in 1887.

Wage Petition in Indianapolis to Be Considered

A petition of three employees of the Indianapolis Street Railway, Indianapolis, Ind., asking for an increase in wages, changes in the procedure of future requests for wage adjustments and the reinstatement of employees who went on strike last July 4, is being considered by James P. Tretton, superintendent. He indicated there probably would not be immediate action on the matter and officials of the company declared the financial condition of the company would not permit of pay increases.

A wage scale of 60 cents an hour for those employed less than six months; 63 cents for those from six months to a year, and 65 cents for those with the company more than a year, was requested. The present scale is 37 to 42 cents over a five-year period. In addition to the regular wage increase asked, operators of one-man cars would receive 7 cents additional under the petition. A minimum monthly wage of $100 is asked.

Ten-Cent Cash Fare in Syracuse

The Public Service Commission on Feb. 4 authorized the New York State Railways, effective on Feb. 10, to establish a 10-cent cash fare with ten tickets for 75 cents on its Syracuse lines.

The new rate was determined upon a tentative rate base of $9,426,739 as of Sept. 30, 1925. Based upon revenue passengers carried for the year ended Sept. 30, 1925, and under the new fare rates authorized, estimating a 2 per cent decrease in travel, 70 per cent of riders using tickets and 30 per cent paying cash fares, the increased revenue, on the tentative valuation above, will give an estimated return of 7.58 per cent upon such value of the property used in giving service on the Syracuse lines.

Campaign to Restore Michigan Suburban Line Continues

Another meeting of the residents in the villages and communities served by the Grand Rapids, Holland & Chicago Railway who are seeking to finance the operation of the proposed United Suburban Railway was held on Feb. 2. A large crowd packed the schoolhouse at Grandville.

H. T. Slaght, banker and chairman of the movement to rejuvenate the road, said that nearly 25 per cent of the $70,000 needed to finance the proposed new company and the operation of the contemplated line between Grand Rapids and Jenison has been raised.

The campaign for stock subscriptions will be continued for one more week. Final report on the subscriptions will be made at another meeting to be held in Grandville during the week ended Feb. 12.

The railway committee is distributing a circular among residents of the suburban communities that answers many questions asked by prospective subscribers and is expected to simplify the work during the last week of the drive to obtain the $50,000 still necessary to assure the project's success.

$2,050,000 to Be Spent in Cleveland

The expenditure of $2,050,000 is contemplated in the program of the Cleveland Railway, Cleveland, Ohio. This would include at least 100 new cars, 25 additional buses and terminals and power units. The completion of the West 117th Street car yards and switching terminals, the completion of the new terminal on Kinsman Road, near Lee Road, and two new power substations, one on the west side and one on the east side, are included. The company may even experiment with three-car train operation.

Abandonment of the present Windermere carhouse on Euclid Avenue, East Cleveland and sale of valuable frontage and rebuilding of terminals on a much larger tract of land which the company has in that vicinity also are planned.

It is proposed to place company stock on the market for this purpose. This would be the first time in nearly ten years that stock has been sold to finance a similar program of improvements.

The annual reports show the company in the best financial condition for some time. The interest fund deficit has disappeared and been replaced by a balance of $212,000.

While some bus lines are understood not to be profitable, the entire operation is regarded as a valuable supplement to rail service.

Higher Fare Sought by Syracuse & Eastern

The Syracuse & Eastern Railroad applied to the Public Service Commission on Jan. 26 for authority to increase its fare in Syracuse, N. Y., by establishing two fare zones, with a fixed rate in each zone at 10 cents. Fare rates on the lines within Syracuse vary from 7 to 14 cents cash.

The petition alleges that the value of the company's property used in giving service in Syracuse is more than $350,000 and that the gross operating income from the entire road, including the 11 miles of line in Syracuse and under existing fare rates, was $1,068 in 1926. The return, the company alleges, did not exceed 2 per cent in 1924 or 1 per cent in 1925 and 1926.

There will be a hearing in Syracuse on Feb. 4 on a complaint by Mayor Hanna of Syracuse against the railroad for alleged violation of law in charging two fares within the city following recent annexation by the city of the Genesee Manor section.

Los Angeles Fare Hearing Adjourned

Hearing on the application of the Los Angeles Railway, Los Angeles, Cal., for an increase in fares has been adjourned until May 17 so that the city's attorneys as well as the railway's attorneys may have time to prepare more evidence. At a hearing on Jan. 13, before State Railroad Commissioner Louttit, Jess Stephens, city attorney, and engineers of the Board of Public Utilities led the opposition to the proposed rate increase from 5 cents to 7 cents and a ticket fare of 6¼ cents. An important point raised by Attorney Stephens was the matter of interchange of transfers between the Los Angeles Railway and the Pacific Electric Railway. Attorney Haskins for the railway agreed to confer with the Pacific Electric Railway officials to discover on what basis such a contract could be made. It was the contention of the witnesses that the present 5-cent fare was too low to yield just compensation for the use of the property involved over and above the amount necessary to pay taxes and operating expenses.

The hearing of the Los Angeles Railway application came on the heels of the Pacific Electric Railway's petition for a 7-cent and a 12-cent local fare and an increase on its interurban lines, as outlined in the JOURNAL for Jan. 22. The City Council in both cases opposed the move.

Jacksonville Property Offered to City

The property of the Jacksonville Traction Company, Jacksonville, Fla., has been offered for sale to the city by J. P. Ingle, manager of the company, but the City Council tabled a motion that a legislative bill be prepared to authorize the city to make the purchase.

In reading a letter offering the railway for sale, Mr. Ingle did not set a price, and in his motion Councilman Barrs asked that the company manager set a figure on the value of the property. Councilman Edward S. Hemphill, proposing the motion to table the matter, declared that the bone of contention was the valuation of the company.

Among other things Mr. Ingle said:

> Five months has now passed since the franchise ordinance was first introduced and to date nothing has actually been accomplished toward drawing up a franchise. I think also I can accurately state that the citizens' committee is more interested in delaying action on a franchise than they are in drawing up one, and the laws and rules committee seems perfectly willing for the citizens' committee to pursue their course of postponement and delay. Whether this policy of postponement and delay will continue indefinitely, I of course cannot say, but at this time I can see no reason to suspect any change unless it be for the citizens' committee to propose such a franchise as will be impossible for us to accept. This will in its effect mean delay and postponement of a settlement of this franchise question.
>
> As the Council knows, before the city could purchase and operate the railway, it would be necessary to obtain special authority to do so from the Legislature. The Legislature meets in April, and there should be no trouble in obtaining the passage of a special act authorizing the city to purchase and operate the railway. We would be glad to join the city in asking the Legislature to pass such an act if the Council desired our assent or assistance.
>
> Action looking to the possible purchase of the railway by the city, furthermore, need not in any way interfere with the drawing up and passage of a franchise by the Council, as such a franchise could contain a provision requiring the company to sell its property to the city at any time within a stated period, if the city decided to purchase.
>
> In coming before your honorable body and again bringing this matter to your attention, I do so largely in the interest of the tens of thousands of citizens who daily use our street cars as a necessary means of transportation. Their interests should certainly receive your earnest attention. Unless and until your honorable body takes some constructive steps toward either putting us in a position where we can supply additional service, or by purchase of the property, giving this additional service yourselves, the car rider is not going to get the service to which he rightfully feels he is entitled.

Arranging for San Francisco's Municipal Railway Bond Issue

By Feb. 1 all of the preliminary details for a bond issue election to finance proposed extensions to the San Francisco Municipal Railway, San Francisco, Cal., will probably be completed. Announcement to this effect was made on Jan. 20 by Supervisor Shannon, chairman of the public utilities committee of the Council.

The committee now has under consideration the extension program of City Engineer O'Shaughnessy, covering five major projects and costing about $3,500,000. To this program others have been suggested by citizens and improvement clubs, the total of which is approximately $2,000,000.

Many proponents of extensions were before the committee on Jan. 20, which was the last day that public hearings on extensions will be held. Among the districts that were heard were Bayview and Quintara Street.

Relief from Paving Charge Up in Detroit

The Street Railway Commission at Detroit, Mich., is considering the question of whether to renew efforts to relieve the department of street railways of the cost of paving between the tracks, as proposed by Del A. Smith, acting general manager of the department. In recommending that the City Council be asked to pass an ordinance embodying the idea, Mr. Smith said the change would save the system $500,000 a year, and that in recent years 46 street railways in the country have been freed of such paving requirements.

City Council of Boston Opposes Public Control

In the pending discussion over the proposed extension of public control of the Boston Elevated Railway, Boston, Mass., the City Council of Boston assumes an adverse attitude. It has voted to oppose further extension of such control, but has taken under consideration Representative Luke D. Mullen's plan for state purchase of the property and the construction of a subway in Charlestown and Roxbury in place of the present elevated structure.

Campaign to Protect Public.—D. W. Henderson, superintendent of the Seattle Municipal Railway, Seattle, Wash., has started an intensive safety campaign to protect the public. Street railway patrons will be warned by conductors and motormen of the traffic dangers. Meetings will be held at the carhouses at which means of lessening dangers in traffic will be discussed.

Accident Record Compiled for Moral Effect.—General Manager Smith of the Beaver Valley Traction Company, New Brighton, Pa., has notified his employees that if they want their accident record for 1926 they may have it compiled by name, years in service, and even by date, time and place. Mr. Smith believes that if an employee knows his record he will be most cautious and learn to do his job in the efficient way, without accidents. Each morning a chart is brought to his desk showing the comparison with the year, month and day previous. Then there follows a report of each accident by name of operator, kind of accident and place.

Interurban Men Receive Increase.—As a result of negotiations between the trainmen's labor adjustment committee and officials of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., interurban trainmen have been granted an increase of 5 cents an hour The increase is retroactive to Jan. 1 and with renewal of present working conditions extends to June 30. The wage agreement for city and suburban trainmen has been extended without change.

Favor Railway Service.—Residents along the South Mason Street line of the Wisconsin Traction, Light, Heat & Power Company, in Appleton, Wis., attending the last meeting of the Council voted in favor of continuing the present railway service instead of abandoning it in favor of bus service. The issue grew out of the company's refusal to move its tracks to the center of the street. The dispute ended suddenly, however, when the company promised to put its tracks in shape, providing no great additional expense would be involved.

Resolution Scores Commission Supervision.—The City Council of East St. Louis, Ill., on Jan. 24 passed a resolution presented by Mayor M. M. Stephens asking members of the Illinois Legislature from the 49th District to vote in favor of a bill providing for city supervision of public utilities instead of supervision by the Illinois Commerce Commission. The resolution is in keeping with the legislative program of the Illinois Municipal League, which would abolish the Illinois Commerce Commission.

City and Tramway Disagree on Fare Change.—The City Council of Colorado Springs, Col., recently denied the Colorado Springs & Interurban Railway a change of fare methods. The company is charging 8 cents cash with two tickets for 15 cents. It asked that it be allowed to make the fare fourteen tickets for $1, or 10 cents for a single cash fare. The Council in denying the change feels that few people would care to invest $1, therefore the change would practically mean a 10-cent fare.

New Attack Affecting One-Man Operation.—The city of Buffalo, N. Y., has attacked the International Railway under a new city ordinance adopted some time ago including certain regulations for the operation of one-man cars. The ordinance, aimed to curb the operation of one-man cars on congested streets, provides that operators of these cars cannot engage in other duties when the car is in motion. One motorman has been arrested in a test case. He is accused of making change and issuing transfers while the car was in motion on a congested street. The penalty for each violation is a fine of not less than $25 nor more than $50. The railway says it will question the validity of the ordinance and that it is prepared to carry the case to higher courts if there should be a conviction.

Recent Bus Developments

Temporary Injunction in Louisville

Court Restrains Competitor of Louisville Railway—Contention of Counsel for Company Reviewed—Briefs to Be Filed at Once—Issue of Great Importance

IN THE suit of the Louisville Railway against the People's Transit Company, Louisville, Ky., asking an injunction to prevent the latter company from operating buses on local streets on which there are railway lines and within a reasonable distance to either side of such streets, Judge William H. Field of the Jefferson Circuit Court on Jan. 28 granted a temporary injunction. The railway at once deposited a bond of $25,000 to indemnify the bus company against loss, in event the suit should be decided against the railway in the Court of Appeals.

As a result of the injunction the People's Transit Company withdrew its buses from Broadway at 4.30 o'clock on Jan. 28 and carried the case to the Court of Appeals, where it was brought up on Jan. 29 at 9 o'clock. The upper court refused a decision in the appeal until briefs were filed and more light cast on what the upper court referred to as an "important case." Attorneys for the railway had until Feb. 1 to file briefs, and those for the bus company an additional day.

Attorneys for the bus company contended that city and state licenses were all that were necessary to operate the line. Those for the railway contend that the bus operators have no franchise and are interfering with a franchise held by the railway.

BUSES MUST HAVE FRANCHISE

The Louisville Railway has a franchise giving it the railway privilege on Broadway. Attorneys for the bus line contend that if the company's position is sustained a taxicab company or any one carrying passengers for hire would have to have a franchise and, perhaps, stay off of certain streets. It was contended that this would also stop all jitneys. It was also contended that if the lower court is upheld, the Louisville Railway would have to secure franchises for operation of its Kentucky Carriers Company chain of buses, operated as feeders to the Louisville Railway in suburban territory.

Judge Field held that buses can be operated on local streets only under franchise, and that a company operating buses without a franchise would be doing so illegally.

The People's Transit Company on Jan. 17 started its Broadway line with six buses. It has been telling about plans for several other lines to be started shortly.

Arguments on the motion for a temporary injunction were made by Mr. Dodd, representing the bus owners, and Churchill Humphrey, general counsel for the railway. Four points were involved in the litigation, Mr. Humphrey pointed out in his argument. The court sustained him on each point.

The principles involved were cited as follows:

> 1. The use of the highway by a bus operating as a common carrier of passengers for hire, over a regular route, according to a fixed schedule and between fixed terminals is a special or privileged use as distinguished from an ordinary or general use.
> 2. There can lawfully be no special or privileged use of the streets of a Kentucky municipality except under franchise rights.
> 3. A citizen and taxpayer may complain of an unlawful street user.
> 4. A franchise holder whose rights are infringed by the unlawful highway user of a competitor may complain of such unlawful highway user.

In arguing the first point Mr. Humphrey contended that the use of the highway by a bus operating as a common carrier of passengers for hire, over a regular route, according to a fixed schedule and between fixed terminals is a special or privileged use as distinguished from an ordinary or general use. In support of this contention Mr. Humphrey cited Section 164 of the Kentucky constitution, which provides that such use can only be secured by franchise, and that before granting such franchise or privilege the city or municipality must offer the franchise for sale to the highest and best bidder.

COUNSEL FOR COMPANY QUOTED

Mr. Humphrey is reported to have said:

> "The contention of the plaintiff is that the defendant's use of the highway is not a natural or ordinary use, but is an extraordinary or privileged use. If this use of the highway be an extraordinary or privileged use, then, obviously, it requires a franchise. Let us inquire, then, as to the use defendant bus company is making of the highway.
>
> The defendant is operating on Broadway from the west end to the east end. It is running buses as a common carrier of passengers for hire, according to fixed schedules, along the Broadway route, between fixed terminals. It is, of course, using the city street, a public highway, for this purpose. Is this use of the city street an ordinary use, or is it a privileged use?
>
> It would be difficult to find any point in our jurisprudence upon which there is such a wealth of authority and such unanimity of opinion. We do not wish to burden the court with a discussion of precedent, but it is necessary to point out how universal is the rule that the use of the public highway by a common carrier is not the ordinary use of the highway, but is a special or privileged use. In other words, an individual or corporation has a natural right to the ordinary use of the highway, but has no right to the privileged use of the highway, except under sovereign grant.

In summing up the facts on point one, Mr. Humphrey declared:

> The use of a highway by a common carrier of passengers for hire, operating between fixed terminals, over designated route, and according to a fixed schedule, is an extraordinary or privileged use of the highway. The Court of Appeals of Kentucky has said so. The Supreme Court of the United States has so decided, as have

> also the highest courts of the following jurisdictions; Alabama, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Massachusetts, Michigan, Mississippi, Montana, New Jersey, Ohio, Oklahoma, Oregon, Texas, Utah, Vermont, Virginia, Washington and West Virginia.
>
> It cannot be necessary to amplify this argument. It would take more vanity than the writer of this brief can muster to think that he could add anything to the careful and reasoned discussions of the 25 jurisdictions which have gone so thoroughly into the question.

In support of point 2, Mr. Humphrey contended there can be no special or privileged use of the streets of a Kentucky municipality except under franchise rights. There is probably no point better settled in Kentucky, he said, than this one, pointing out a long list of precedents to this effect developed by the Court of Appeals.

GENERAL COUNCIL MUST PASS ON MATTER

In summarizing point 2, Mr. Humphrey said that in order to acquire the privileged use of the streets of Louisville a franchise authorizing such privileged use must be created by the General Council, which must be sold at public auction and the person or corporation claiming the right must buy at such sale. None of these conditions has been complied with, he said, in the case involved.

In discussing the other two points raised by the railway, Mr. Humphrey said, in referring to point 3, any citizen or taxpayer may complain of an unlawful street user. It has been held in Kentucky, he said, that a citizen and taxpayer may complain of the unlawful use of the city streets by a concern operating without franchise rights.

On point 4 he indicated that a franchise holder whose rights are infringed by the unlawful use of a highway by a competitor may complain of such unlawful highway user, and cited the case of the Reo Bus line against the Big Four Bus line to support his contention that a franchise is necessary to operate on the public highways. Again he was quoted:

> The case at bar presents a curious state of facts. The Louisville Railway is one of the largest taxpayers to the city of Louisville. Not only has it acquired franchise rights and assumed franchise obligations, but also it has constructed and maintains its own track and roadbed and, in addition, it is paying, by taxes and as a direct obligation, for the surfacing of the city streets over which its competitor, with no obligation, or even idea, of general service, is attempting to raid its only profitable lines to the breakdown of the general transportation system in Louisville. Where we have a constitution providing that operating obligations must accompany operating rights, it hardly seems to us that a situation will be allowed to continue whereby the established, responsible, obligated company must pay taxes to construct and maintain streets upon which its unestablished, irresponsible and unobligated competitor can destroy it.

BUS COUNSEL'S CONTENTION

In his argument against the injunction, Mr. Dodd contended that buses are different from street cars, and that their use of the streets or highways is not a special or privileged use, as contended by the railway and that they therefore do not require a franchise before they can operate. Buses are not required to secure a franchise, he contended, any more than the jitneys or taxicabs, which have undisputed use of the streets day and night.

Consent Sought for Independent Operation in Buffalo

The Buffalo Motor Coach Company, Inc., which has obtained franchises from the City Council of Buffalo, N. Y., for the operation of three bus lines in the city, has applied to the Public Service Commission for a certificate of convenience and necessity so that the lines can be put in operation as soon as possible.

Ernest M. Howe, Detroit, president of the company, says eighteen buses will be used at the start on routes 1 and 2 and seven buses will be used on route 3. The buses will be of the single-deck, one-man, pay-as-you-enter type with seating capacity for 29 passengers.

An 8-cent cash fare will be charged with free transfers to connecting bus lines of the company.

Several of the routes will serve territory now reached with local lines of the International Bus Corporation, a subsidiary of the International Railway, which is opposing the new corporation before the Public Service Commission. The commission has not yet fixed a date for a hearing on the proposed right to operate in Buffalo.

Bill Would Tax Bus Companies

Bus companies operating in St. Louis, Mo., would be required to pay a 5 per cent tax on their gross receipts if a bill presented to the Board of Aldermen by Alderman Schwartz of the Twentieth Ward is passed and signed by Mayor Victor J. Miller. The measure was introduced at the request of Comptroller Louis Nolte and Director of Streets and Sewers Robert B. Brooks. They contend that the present tax of 3 per cent of gross receipts is inadequate to repair the damage caused to streets by the buses. Companies operating only part of their lines in the city would pay in proportion to the mileage in the city and on their entire system.

W. H. Vanderbilt Acquires Bus Company in Connecticut

The controlling interest in the Connecticut Motor Transportation Company has been acquired by William H. Vanderbilt, purchase being made through the Automotive Transportation Company, Inc., which was organized in 1925 by Mr. Vanderbilt and associates. The new acquisition controls the Gary Transportation Company, operating in the northeastern section of Connecticut; the Conlin Bus Lines, Inc., plying between Springfield and Worcester, and the Newport-Providence Street Railway.

Mr. Vanderbilt, who is president of the Automotive Transportation Company, Inc., and chairman of the board of directors of the corporation, said that no immediate radical changes were contemplated. He has been interested in motor transportation since 1925, when he invested in the Newport & Providence Street Railway. This company operated railway cars from Newport to Bristol Ferry, but with the adoption of buses the service was continued to Providence. During the past few years Mr. Vanderbilt has been buying into Massachusetts and Connecticut bus companies.

Would Run Buses.—The Illinois Power & Light Company has applied to the Illinois Commerce Commission for permission to discontinue railway service in Hillsboro, Ill., running from the Big Four depot to the Court House and from Hillsboro to Taylor Springs, and substitute buses for the cars.

Bus Lines Bought.—The Worcester Consolidated Street Railway, Worcester, Mass., has purchased the Lake Bus Lines, Inc., from Henry R. Carter. The deal includes seven buses. The Worcester company plans to continue the line, which operates between Salem Square and the north and south ends of Lake Quinsigamond.

Increases Coach Service.—The Wisconsin Power & Light Company has added two more coaches to its fleet of buses supplying city service in Sheboygan. The coaches are of 22-passenger capacity and will be used during the light traffic hours in place of the heavier 29-passenger buses. During peak loads both types of buses will be used. The company now has nine coaches in city service.

Bus Permit Granted in Oakland.—A certificate of public convenience and necessity has been granted by the California Railroad Commission to the Key System Transit Company to operate buses on Telegraph Avenue, in Oakland, between a terminus at Eleventh Street and Broadway and a terminus at Alcatraz Avenue and Dama Street and intermediate points as an extension and in connection with its present street railway system. The company intends to co-ordinate railway and bus service on Telegraph Avenue, using 29-passenger buses of safety type, charging a 7-cent fare with transfers.

Substitution Not Approved.—The proposed amendment of a Peoria, Ill., ordinance to permit the Peoria Railway to substitute buses on its Sixth and Second Avenues car lines has been referred to a committee of the Council for further investigation. It was announced, authough not a part of the official proceedings, that the railway proposed to have a bus line in operation by March 1 across the bluff district and down Western Avenue. This line was suggested recently by members of the Council.

Seeks Reconsideration.—The Interstate Buses Corporation, Hartford, Conn., has asked the Supreme Court of the United States to reconsider its recent decision which upheld the state of Massachusetts. The Interstate Buses Corporation sought to have an injunction lifted which prevented the operation of a bus line between Springfield and Greenfield, Mass., without first obtaining licenses from the towns through which the line passed. The injunction was imposed on a complaint by the Holyoke Street Railway. The corporation asserted that the case had been decided by the Supreme Court on the ground that the regulations complained of did not prejudice Interstate carriage of passengers, a question not considered in the lower court.

Financial and Corporate

Boston "L" Does Well

Earnings Satisfactory Under Very Trying Conditions—Increase in Number of Passengers Carried

During 1926 the cost of service on the Boston Elevated Railway, Boston, Mass., was $482,749 in excess of receipts. This is disclosed in the annual report which the board of public trustees has submitted to the Massachusetts Legislature. In 1925 the company earned $502,194 in excess of cost.

Total receipts in 1926 were $35,481,313 as against $34,547,380 in 1925, but wages had gone up from $16,931,550 in 1925 to $17,697,378 in 1926; total operating expenses went up from $24,405,736 to $26,076,268 and taxes went up from $1,652,518 to $1,910,765.

The number of revenue passengers increased to 371,218,401 from 365,036,286 in 1925.

Motor bus mileage of the Boston Elevated in 1926 compares with four previous years as follows: 1926, 4,717,900; 1925, 2,472,456; 1924, 890,901; 1923, 465,382; 1922, 63,937.

On Dec. 31, 1926, the road was operating 150 owned buses, as compared with 69 on Dec. 31, 1925. In addition, on Dec. 31, 1926, the road was operating 80 leased buses, against 80 in 1925.

In discussing phases of operation the trustees say in their report that while there has been a reduction in some types of accidents, vehicle collisions have increased and there has been an increase in total expense for injuries and damages of $261,000 over the preceding year.

The annual charge for depreciation is $346,000 more than for the previous year due to increases in investment in depreciable property. By far the greater portion of this increase arises from the expansion of bus service and consequent increase in number of buses owned. The life of a bus is relatively short as compared with nearly all other elements of the properties and consequently necessitates the annual accrual of a high percentage of the cost in order to provide for replacement at the proper time.

Added revenue arising from greater number of passengers carried and from larger payments from advertising and station privilege contracts has offset some of these increased costs but the net result is as stated above. Effort has been made during the year adequately to meet proper maintenance charges, which had been curtailed somewhat during the previous year. The trustees say:

> For some time test installations of automatic passimeters similar to those commonly in use in New York subways have been made with apparent success. Sixty of these have been ordered and when placed in use will result in operating economy.
>
> In conjunction with the transit department of the city of Boston a very considerable amount of work has been performed on the Dorchester Tunnel Extension. It is anticipated that the portion to Fields Corner will be placed in operation during the current year. Sixty additional cars of the type now in use in the Cambridge-Dorchester Tunnel service have been ordered and will be received by the time this portion of the extension is ready for operation.
>
> The Somerville garage was placed in operation on Dec. 6, 1926, with a present capacity of 112 buses. This made possible the surrender of some leased garage space and avoided the necessity of leasing additional quarters.
>
> Replacement of the last wooden elevated cars, 100 in number, has been undertaken by an order for a similar number of modern steel cars. Eighty-one buses have been added during the year to cover the line on which bus operation has been started.
>
> Snow-fighting equipment to meet the exigencies of snowstorms under present-day traffic conditions has been added at a cost of $28,000, so that at the present time there is more than $600,000 invested in snow-fighting equipment.

TRAFFIC STATISTICS OF THE BOSTON ELEVATED RAILWAY

	1926	1925	1824
Round trips operated	7,526,260	7,185,587	6,994,749
Passenger revenues	$34,393,954	$33,790,442	$33,419,172
Passenger revenue per car-mile	59.41c	60.93c	59.69c
Passenger revenue per car-hour	$5.75	$5.86	$5.67
Passenger revenue miles	†57,895,881	†55,461,094	†55,988,679
Passenger revenue car-hours	5,980,267	5,767,957	5,894,115
Revenue passengers carried	371,218,401	365,036,286	382,888,848
Revenue passengers carried per car-mile	6.412	6.582	6.838
Revenue passengers carried per car-hour	62.07	63.28	64.96

†Including motor bus mileage.

System of Accounting for Depreciation

Interstate Commerce Commission Announces Hearing to Be Held on Plan to Be Prescribed for Electric Railways Submitted for Its Consideration

THE Interstate Commerce Commission announced on Jan. 27 that the depreciation section of its bureau of accounts proposes to enter an order prescribing a system of depreciation accounting for electric railways substantially the same as that entered recently with respect to depreciation charges of steam railroad companies. Before considering the proposed order, the commission will hold a hearing on Feb. 28, at Washington, D. C., before Examiner Bunten, at which those concerned will be given opportunity to testify. The text of the notice follows:

By paragraph 5 of Section 20 of the interstate commerce act, as amended by the transportation act, 1920, the Interstate Commerce Commission is directed, as soon as practicable, to "prescribe for carriers subject to this act, the classes of property for which depreciation charges may properly be included under operating expenses, and the percentages of depreciation which shall be charged with respect to each of such classes of property, classifying the carriers as it may deem proper for this purpose."

In carrying out this provision of the act the commission upon its own motion instituted a general investigation of depreciation charges of all classes of common carriers subject thereto and has held hearings and heard argument concerning depreciation charges of steam railroads and of telephone companies. Following this the commission's report, Telephone and Railroad Depreciation Charges, 118 I.C.C. 295, in which a general discussion of the subject appears, together with appropriate orders in the matter, was made public.

As the fundamental principles which are controlling in the application of depreciation accounting for the property of steam railroad companies and telephone companies appear to be controlling also with respect to the application of depreciation accounting for other classes of common carriers, the depreciation section of the bureau of accounts which conducted the various preliminary investigations now proposes:

1. That the commission enter an order concerning depreciation charges of electric railways substantially the same as that entered with respect to depreciation charges of steam railroad companies.

2. That the classes of property of electric railways for which depreciation charges may properly be included under operating expenses are the classes of property includible in the following accounts:

WAY AND STRUCTURES

No.	Name
505,	Ballast.
506,	Ties.
507,	Rails, rail fastenings and joints.
508,	Special work.
509,	Underground construction.
511,	Paving.
512,	Roadway machinery and tools.
513,	Tunnels and subways.
514,	Elevated structures and foundations.
515,	Bridges, trestles and culverts.
516,	Crossings, fences and signs.
517,	Signals and interlocking apparatus.
518,	Telephone and telegraph lines.
519,	Poles and fixtures.
520,	Underground conduits.
521,	Distribution system.
522,	General office buildings.
523,	Shops and carhouses.
524,	Stations, miscellaneous buildings, and structures.
525,	Wharves and docks.
526,	Park and resort property.

EQUIPMENT

530,	Passenger and combination cars.
531,	Freight, express and mail cars.
532,	Service equipment.
533,	Electric equipment of cars.
534,	Locomotives.
535,	Floating equipment.
536,	Shop equipment.
537,	Furniture.
538,	Miscellaneous equipment.

POWER

539,	Power plant buildings.
540,	Substation buildings.
541,	Dams, canals, and pipe lines.
542,	Power plant equipment.
543,	Substantial equipment.
544,	Transmission system.

FINDING IS REVISED

3. That in the place of finding (8) in No. 15100 regarding the assignment of specific amounts to the primary accounts under road and equipment the following findings shall be made:

That each electric railway which has not yet assigned appropriate amounts to the primary road and equipment accounts covering property for which depreciation accounting is herein prescribed shall do so not later than Jan. 1, 1928; that such companies as have already made an assignment of investment to the primary accounts, shall redistribute the same; that such distribution or redistribution shall be made as indicated below; and that the remainder of the amount in the books representing the carrier's investment in road and equipment shall be carried in sub-accounts which will be provided for later in the commission's classifications, for inclusion of the carrier's unassigned investment in road and equipment;

(a) Where the property has been constructed by or for the accounting company, the amount to be assigned to the primary accounts covering depreciable property shall be based upon the actual cost of construction if such information is available, and if the actual cost is not available the amount to be assigned to the primary accounts covering depreciable property shall be upon basis of the estimated cost of construction as of the date the property became available for operation.

(b) Where the investment account of the carrier includes the cost of property not constructed by or for the accounting company which was purchased at a cost in excess of its depreciated structural value as of the date purchased, such structural value, less an allowance for that portion of the purchase price includible in accounts not classed as covering depreciable property, shall be apportioned to the primary accounts covering the depreciable property.

(c) Where the investment account of a carrier includes the cost of property not constructed by or for the accounting company which was purchased at a price equal to or below its depreciated structural value as of the date purchased, the apportionment of the cost to the accounting company to the primary accounts covering the depreciable property shall be upon a basis which will permit the assignment to other primary road and equipment accounts of an appropriate proportion of the same.

$1,900,000 Equipment Trust for Philadelphia Rapid Transit

A new issue of $1,900,000 of 5 per cent equipment trust certificates, series K, of the Philadelphia Rapid Transit Company, Philadelphia, Pa., is being offered by Dillon, Read & Company, New York. The proceeds will be used in part payment for new gas-electric motor bus equipment. The certificates are issued under the Philadelphia plan and will mature from Dec. 1, 1927, to 1936. They are priced to yield from 4.75 to 5.30 per cent.

Reference to the 218 buses to be covered by the equipment trust is made elsewhere in this issue.

Passenger, Fare and Wage Figures Compared

The electric railways close the year 1926 with a substantial increase in their traffic for the month of December, and the result for the whole twelve months of 1926 was an increase over the year 1925.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 213 companies for December, 1926, compared with December, 1925, is as follows:

December, 1926	867,763,895
December, 1925	852,109,119
Increase, per cent	1.84

For the calendar year 1926, a group of 217 companies, with only a few companies missing for the last few months of the year, reported the following number of revenue passengers, including bus passengers, carried:

Calendar year 1926	9,655,400,529
Calendar year 1925	9,534,870,690

The average cash fare in cities of 25,000 population and over follows:

	Cents
Jan. 1, 1927	7.7570
Dec. 1, 1926	7.7423
Jan. 1, 1926	7.6213

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track follow:

	Average Hourly Rate, Cents	Index Number 1913=100%
Jan. 1, 1927	56.88	208.73
Dec. 1, 1926	56.88	208.73
Jan. 1, 1926	56.31	206.64

Toronto Deal Completed

Transportation Commission, Now Operating City Lines, Takes Over Control of Radials

Dawn of a new day at the beginning of a new year seems to have been the time appropriately designed for the transmittal of authority over Toronto's radials from one commission to another. At midnight on Jan. 12 in the North Toronto radial station on Yonge Street, the city's boundary line, Mayor Foster acted as intermediary in passing over the official agreement of operation from the hands of W. R. Robertson, general superintendent of the Ontario Hydro Radials, to the hands of P. W. Ellis, chairman of the Toronto Transportation Commission. But the ceremony of a few minutes was the amen to the battle between the "powers that be" of the two commissions and the city, which has raged for more than a year and a half. The agreement was approved unanimously by all members of the City Council present on Dec. 17—with the exception of the Mayor, who refrained from voting, and Alderman Wright, who was absent from the meeting. It should, perhaps, here be explained that the radials have a financial structure entirely independent of the city system.

Seldom has a city staged so dramatic a performance of its civic affairs as did Toronto on this occasion. But the new addition of railways has brought the system out of its local territorial interest to that of a broader scope in that it now constitutes the second largest electric railway system in North America under public ownership, Detroit having first place. Festivities lasted from 7 o'clock one evening until nearly 3 o'clock the next morning. The Mayor acted as leading dramatist in the rôle of conductor of the first car, gayly draped in flags with huge letters T.T.C. emblazoned on its sides, which was run from the city under the new management.

MILEAGE NOW UNDER TORONTO TRANSPORTATION COMMISSION

	Single-Track Miles
City street railways	227
Buses (included in city fare)	18
Coach route in city	8
Township and Weston lines	16
York radials	97
	366

For many years, according to the Toronto press—which also played its part in most effective co-operation—it was the dream of the late Sir Adam Beck, the founder of Hydro, to see high-speed radials meet in the heart of the city under unified control. But it was a vision of a very huge transaction, involving more than $3,000,000, with $1,088,000 actually being paid in cash and $2,375,000 assumed by the city in bonds which represent the McKenzie interests of 90 miles of road. Operation cannot be begun in the downtown section, however, until winter is over, because the gage of the metropolitan and Mimico divisions will have to be changed. Meantime, a temporary connection will be made between the West Hill line and the city system.

In all 366 miles of lines have been acquired by the city for municipal operation.

According to D. W. Harvey, general manager of the Transportation Commission, this does not mean that other municipalities will not be taken into partnership agreements. When asked the question by a newspaper reporter, he answered in the affirmative.

Quotations from the agreement provide that:

Clause I.— . . . "all the powers, rights, authorities and privileges of the city as to control, management and or operation of the railways and future extensions or additions to such railways, or any transportation service to be operated in connection with such railways shall be exercised by the commission and not by the Council of the city.

Clause IIIa.—The city will from time to time furnish to the commission on demand such moneys as it may require to carry out its powers and duties hereinunder including such sum in excess of operating revenues as may be required to meet the full cost of maintenance and operation, which cost shall include such maintenance, renewals, depreciation and debt charges as the commission shall think proper; notwithstanding anything in the foregoing, any moneys requested by the commission for new capital expenditure shall only be furnished it when approved by the Council of the city.

Clause IV deals with the powers and duties, namely, that the commission will have power to extend the railways by lines of railways, motor bus routes or any other means of transportation, and to control, maintain, operate and manage such additions. That it will fix fares and tolls so that as far as possible transport will be self-sustaining after providing for maintenance, renewals, depreciation, etc.

Clause VI provides that the commission will keep separate books of accounts of receipts and expenditures of the new divisions provided in the agreement and Clause VII that all moneys will be kept separate for this purpose also. Other provisions follow:

Clause IX.—Immediately after the close of each calendar year the commission shall submit to the Council of the city a completely audited balance sheet and certified financial statement of the affairs entrusted to it by this agreement, including a revenue and expense account, and profit and loss statement of each division of the railways and said statement shall be accompanied by a general report of the operations of the commission under this agreement during the year.

Clause XII.—The commission will, if it deems advisable after providing for maintenance, repair and operation and such maintenance renewals, depreciation and debt charges as it shall think proper pay to the city any surplus of revenue over expenditures remaining in its hands at the end of any year in respect of the railways and transportation services entrusted to its management by this agreement.

Groton & Stonington Reorganizes

New directors of the Groton & Stonington Traction Company, Mystic, Conn., are Clarence E. Thompson, Jr., New Haven, and Lucius E. Whiton, New London. The new financial structure contemplates an issue of $250,000 first mortgage income bonds. Each holder of a $1,000 of first mortgage bond of the Groton & Stonington Street Railway will receive a new $500 bond of the Groton & Stonington Traction Company, together with ten shares of stock, par value $100. The Winthrop Trust Company, New London, is trustee under the indenture securing the first mortgage bonds.

Change in Fairmount Park Capital Structure

At the annual meeting of the Fairmount Park Transit Company, Philadelphia, Pa., to be held on Feb. 21, stockholders will vote upon a change of capital stock of the company to provide for the authorization of 150,000 shares of common stock without par value in lieu of the present authorized common stock of 40,000 shares, par $10, and to provide for the authorization of the issuance of three shares of common without par value about to be authorized by the State of Delaware in exchange for each share of the common stock now issued and outstanding.

Combined operating account of the Fairmount Park Transit Company and the Woodside Real Estate Company for the year ended Dec. 31 shows revenue from all sources of $565,700, compared with $449,661 in 1925. After operating expenses, interest, depreciation, but before deduction for federal taxes, there was a combined profit of $114,286, compared with $57,215 in 1925.

Auction Sale of Washington-Virginia Line

The Washington-Virginia Railway, Washington, D. C., is to be sold at auction some time in April next. An announcement to this effect was made recently by Attorney Gardner L. Boothe, division counsel of the company. The Circuit Court has named John S. Barbour, Judge J. K. M. Norton and Gardner L. Boothe with Edward Hopkinson of Philadelphia as commissioners of sale.

The road, which consists of 40 miles of track connecting Alexandria, Va., Washington, Mount Vernon and Fairfax, was placed in the hands of a receiver on Nov. 23, 1923. At one time the road was virtually the only means of transportation to Mount Vernon and to Alexandria, but bus lines have hurt it recently.

It is said that the total bonded indebtedness of the road is $3,500,000, of which amount $2,500,000 is on the Mount Vernon division and $1,000,000 is on the Falls Church division. No interest has been paid on the bonds for several years.

6,000 Shares Sold to Residents of Dallas

The initial offering of Dallas Railway & Terminal Company, Dallas, Tex., 7 per cent cumulative preferred stock placed on sale on Nov. 4, 1926, has met strong public demand and more than 6,000 shares have been sold.

As J. W. Carpenter, president of the company, sees it, the excellent financial condition of Dallas people is reflected in the sale of the stock. At the time the stock was placed on sale there was much talk about the depressing effect of low cotton prices on general business conditions in Dallas. The sale of the stock is limited exclusively to Dallas residents. The fact that more than 96 per cent of all sales have been for cash shows there is money available for sound investments. Since the purpose of selling the stock to the public is frankly to obtain more active and widespread interest in the company by its patrons, the officers of the company are especially pleased with the wide distribution of stock in small lots to investors who take a personal interest in the company.

Mr. Carpenter said:

> The loyalty of our employees is shown by the fact that more than 98 per cent have bought stock for themselves and a large number have been active in selling to the public. Keen competition by employees in the sale of this stock has made it necessary for them to become better acquainted with company policies and the educational effect of the campaign is reflected in the improved personal service that has come from it. Since our employees are now financially interested in the company and realize that many of their patrons are company stockholders, there is increased incentive to render high-class service.

Receivership of Oklahoma Railway May End Soon

The receivership of the Oklahoma Railway, Oklahoma City, Okla., may be ended at the close of 1927 provided there is no slump in business conditions, according to Gabriel T. Lackey, joint receiver with George A. Henshaw and president of the company. The company had approximate net earnings of $60,000 during 1926, which was its most successful year of two years of receivership. The company made many improvements in 1926. Perhaps the outstanding achievement was establishment of a system of 26 buses which are self-supporting.

New Director Elected.—W. G. Murrin, vice-president of the British Columbia Electric Railway, Vancouver, B. C., Canada, was elected a director of the company at the annual meeting of shareholders in London, England, on Dec. 15.

Pittsburgh Pays Its Notes.—It was announced recently that the $500,000 of 6 per cent notes of the Pittsburgh Railways, Pittsburgh, Pa., due on Feb. 1, 1927, would be paid off at maturity at the office of the Union Trust Company, Pittsburgh.

New Bill Would Double Tax Rate.—A bill has been introduced before the Wisconsin Legislature providing for the taxation of light and power companies operating electric railways according to the local rate of the community in which they operate, to replace the general tax rate method now in force. If the bill is enacted the general tax rate of 2.01 now levied against these companies would be practically doubled.

Ordered to File Objections.—Carl F. Morrow, judge of the Circuit Court at Anderson, Ind., has ordered creditors of the Union Traction Company of Indiana, now in receivership, to file their objections, if any, by April 2, to a report filed July 30, 1926, by Arthur W. Brady, receiver of the Union Traction Company.

Will Vote on New Financial Plan.—In accordance with recommendations made by the board of directors of the Wisconsin Public Service Corporation, Green Bay, Wis., stockholders were to vote on Feb. 3 on a new financing program which provides for increasing the amount of preferred stock from $5,500,000, par value, to $12,500,000, increasing the authorized common from $3,000,000 to $7,500,000 and dividing up the present $100, par value, common shares into $10 par value common stock. In explaining this change in the financial structure. Clement C. Smith, chairman of the board, asserted that business has been growing very rapidly and additional capital was needed for development.

New Directors Elected. — Henry Scandrett, vice-president of the Union Pacific Railroad, and Emmet Tinley were recently elected directors of the Omaha & Council Bluffs Street Railway, Omaha, Neb. Their affiliation with the board of directors of that company increases the number to eleven members.

Exchange of Securities at Evansville.—The Evansville & Ohio Valley Railway, operating from Evansville, Ind., to Mount Vernon, Ind.; Grandview, Ind., and Henderson, Ky., has been granted permission by the Indiana Public Service Commission to issue $235,100 in first and refunding 7 per cent bonds in exchange for $235,000 of 7 per cent preferred stock of the Evansville, Henderson & Owensboro Railway.

Residents Favor City Purchase.—Residents of the Rainier Valley, an urban district of Seattle, Wash., are working to mold public opinion prior to the March elections to the end that the lines of the Seattle & Rainier Valley Railway be purchased by the city for $1,200,000 and made a part of the municipal railway system. The City Council has approved the purchase. The matter is now up to the voters at the March election. It is pointed out that the city can save $160,000 a year in transportation costs by operating over the tracks on Fourth Avenue now owned by the Rainier Valley system and used exclusively by it, at which rate, it is estimated, the lines would be paid for in 7½ years.

New Mexico Loses Railway.—The Las Vegas Transit Company, Las Vegas, N. M., has been authorized by the City Council to abandon railway service. The company has had a losing struggle with automobile competition and fares are not enough to offset this loss. The line was 3 miles long. It was operated between Las Vegas and East Las Vegas.

Harp on Colorado Abandonment.—Attorneys, citizens and various business bodies of the cities of Louisville and Boulder, Col., are after the Colorado Public Utilities Commission to force Receiver William H. Edmunds of the Denver & Interurban Railroad to restore the operation of trains on the road, regardless of the fact that the federal District Court at Denver instructed the receiver to discontinue operation because the road was unable to pay its debts; that it should sell the properties and turn the money over to its creditors. Some lawyers claim that should the commission take any such action, it would be in contempt of the federal court. No electric trains are being operated despite the speculation. The trains were discontinued on Dec. 15.

Legal Notes

FEDERAL CIRCUIT COURT OF APPEALS.—*Division of Cost of Maintaining Railroad Gates at Crossing.*

A steam railroad and an electric railway made a contract for the maintenance of a crossing by which the larger part of the cost of maintaining the crossing was placed upon the electric railway company. Later, the latter sued the railroad company to recover up to half the cost of maintenance of the crossing on the ground that the contract was void for want of consideration. It was held, however, that the obligation of the steam road to maintain gates at the crossing was sufficient consideration to support the contract. [Erie Railroad vs. Cleveland Railway, 15 Federal Rep. (second), 374.]

FEDERAL CIRCUIT COURT OF APPEALS—*Judgment for Seller of Street Railway Against City Which Acquired Railway Through Action of Council Held Not Chargeable Against General Funds of City.*

Laws of the state of Washington prescribe two methods by which a municipality may acquire a street railway or other utility. The first method is where a general indebtedness is to be incurred. With this method, the plan and cost thereof must be approved by the voters. The second method is where the charter of the city, adopted by vote of the people, authorizes the authorities to acquire the property, but its cost and expense of operation is to be paid exclusively from its own revenues. In this case the city council may act alone. In an agreement to purchase a railway, made according to the second method, the city agreed to pay a certain proportion of the taxes on the property for the year of purchase as part of the consideration, but the Circuit Court of Appeals for the Ninth Circuit held that this amount was not collectible from the general funds of the city. [City of Seattle vs. Puget Sound P. & L. Co., 15 Federal Rep. (second), 794.]

FEDERAL SUPREME COURT — *Statute Specifying Price of Gas Held Invalid.*

In an act approved June 2, 1923, the New York State Legislature directed that thereafter in New York City not more than $1 per 1,000 feet should be demanded for gas of 650 B.t.u. The statute was declared invalid because confiscatory. [Ottinger vs. Consolidated Gas Co., New York, 47 Supreme Court Rep., 198. Also two similar cases on page 199.]

FEDERAL SUPREME COURT—*Valuation of Utility Based on Present Prices and Price Trends. Seven Per Cent Return Sustained.*

"In determining present value, consideration must be given to prices and wages prevailing at the time of the investigation; and, in the light of all circumstances, there must be an honest and intelligent forecast as to probable price and wage levels during a reasonable period in the immediate future. . . . The testimony of competent valuation engineers who examined the property and made estimates in respect of its condition is to be preferred to mere calculations based on averages and assumed probabilities. . . . The evidence is more than sufficient to sustain the rate of 7 per cent found by the commission, and recent decisions support a higher rate of return." [This decision was reviewed editorially on page 1034 of the issue of this paper for Dec. 11, 1926.] [McCardle vs. Indianapolis Water Co., 47 Supreme Court Rep., 144.]

ILLINOIS—*Duty to Repave Held to Include Reconstruction after Water Mains Are Laid.*

According to the 1907 ordinance, the Chicago City Railway Company was obliged, at its own expense, to fill, grade, pave and repair that portion of the street occupied by it as specifically provided in an accompanying exhibit. This duty was held to include that of repairing its portion of the street when such repair became necessary for any reason, as when the city had removed the paving for the introduction of water and sewer pipes. The railway company's track foundations, for this purpose, were held to be a part of the "street," so that track foundations removed by the city in its work of laying the water and sewer pipes had to be renewed at the expense of the company. [Chicago City Ry. vs. City of Chicago, 154 Northeast. Rep., 112.]

MASSACHUSETTS—*Motorman Not Negligent When Car Hits Person Stooping on Track.*

A person occupying a house adjoining an electric railway exposed track attempted to drain some water from his basement with a hose, and while on the track stooping over to adjust this hose was struck by a car. He was not in a place where a motorman might reasonably anticipate someone would be on the track, and as he was in a stooping position, he could not readily be seen by the motorman, although it was not dark. The company was held not responsible. [Chatterton vs. E. M. Street Railway, 154 Northeast. Rep., 259.]

MISSOURI — *Duty Under "Vigilant Watch" Ordinance.*

Under the St. Louis Vigilant Watch Ordinance, it is the motorman's duty to be on the lookout for persons or vehicles on or approaching the track and to stop his car in the shortest space and time possible. This duty is continuous and failure of the motorman to see an approaching automobile in time to avoid collision with it from a point where he could have seen it in the exercise of the care prescribed by the ordinance constituted negligence. [Riggle vs. Wells, 287 Southwest. Rep., 803.]

NEW YORK—*Injury to Finger in Sliding Door.*

A passenger to preserve his equilibrium in boarding a subway car placed his hand on the edge of a sliding door operated pneumatically in multiple with other doors. The door moved forward, then slid back into its casing, bruising and contusing one of the fingers of the plaintiff. Judgment for the defendant was affirmed on the ground that the accident was not caused by any negligent act of the defendant's servants. [Siegel vs. Interborough R.T. Co., 214 N. Y. Supp., 71.]

NORTH CAROLINA.—*Reckless Driving Even If Not Followed by Collision Constitutes Negligence.*

Where a person was struck by a bus which turned off the road to avoid being struck by a bus with a different owner, the relative liability of the owners of each bus was held for the jury. [Shipp vs. United Stage Lines, 135 Southeast. Rep., 339.]

OHIO.—*Responsibility to Provide Safe Alighting Place for Passengers.*

A passenger, alighting from one car to transfer to another, tripped over a rail which was from two to four inches above the general level of the ground. While the passenger might have seen the rail if he had looked for it, his failure to do so was not held to be negligence. The stressing by the plaintiff's counsel of the fact that subsequent to the accident, there had been a substantial reconstruction by the company which reduced the height of the projecting rails—a fact not brought in issue by the defendant's evidence—was held reversible error. [Cleveland Railway vs. Halterman, 153 Northeast. Rep., 922.]

OREGON.—*Automobile Driver Making Left-Hand Turn in Front of Approaching Car Held Negligent.*

An automobile driver who, while closely following a street car, attempted to make a left-hand turn at a street intersection and was struck by a street car coming from the opposite direction, was held to be contributorily negligent as a matter of law for recklessly attempting to pass in front of a fast moving car. [Grasle vs. Portland R. L. & P. Co., 250 Pacific Rep., 379.]

TEXAS—*Railway Responsible for Prompt Removal of Injured Person to Hospital.*

A woman passenger fell while on a car and then was taken by the employees on a long trip to the company's office, then transported to a hospital, and then to her home. The entire trip lasted between two and two-and-a-half hours. Even though the company's negligence did not cause the original fall, it was liable for damages resulting from her detention on the car. [San Antonio P. S. Co. vs. Wellman et al., 288 Southwest. Rep., 582.]

WASHINGTON.—*Injury to Pedestrians at Street Intersection.*

Pedestrians at a street intersection who looked but failed to see the approaching car which struck them were held not contributorily negligent as a matter of law, as the approaching trolley car was obscured by intervening vehicles. [McLeod vs. the City of Seattle, 249 Pacific Rep., 1059.]

Personal Items

New Assistant Manager at Toronto

H. W. Tate Appointed Assistant Manager of Municipal Railway to Succeed A. T. Spencer

H. W. Tate has been appointed assistant manager of the Toronto Transportation Commission, Toronto, Ont., because of a vacancy created when A. T. Spencer, formerly assistant to the general manager, received an appointment as general superintendent of construction and maintenance in the way and structures department of the Montreal Tramways, Montreal, Que.

Mr. Tate was the first engineer to join the commission's staff, in 1920, and was engaged in the formation of the commission's rehabilitation and extension plans prior to the summer and fall of 1921, when the completed organization was formed and rehabilitation of the old lines of the Toronto Railway by the city commenced. He was appointed field engineer of the way department on Sept. 1, 1921, and was associated with the commission in this capacity during the rehabilitation of the unified transportation system in Toronto. Later, in May, 1924, Mr. Tate became engineer of way and was in charge of the way department until Jan. 25, 1927, when his appointment to the position of assistant manager was announced.

H. W. Tate

The new assistant manager is a graduate of the University of Toronto, having concluded a brilliant academic course when he led the graduating class of 1910 in civil engineering and received the degree of B.Sc. The wide range of his practical experience also has been a factor in qualifying Mr. Tate for his advancement. In 1905 and 1906 he was with the Canadian Pacific Railway on irrigation and maintenance of way. For three years, 1907-08-09, he was associated with mining engineering in the Cobalt camp. During the five years 1910 to 1914 he was engaged in land surveying and municipal engineering.

The World War interrupted Mr. Tate's career in civil life, but his enlistment in the Canadian Expeditionary Force with the Second Pioneer Battalion early in 1915 opened opportunities for wider engineering experience. During his four years of active service, three of which were spent in France, he attained the rank of major and was second in command of the Ninth Battalion Canadian Engineers. For three months, during which occurred the Canal du Nord attack of October, 1918, Major Tate, in the absence of his colonel, was in command o fthe battalion. He was twice mentioned in despatches by Sir Douglas Haig for gallant and distinguished conduct in the field.

Returning from overseas in 1920, Major Tate joined the staff of the Toronto Transportation Commission. He is an Ontario land surveyor, a Dominion land surveyor, an associate member of the Engineering Institute of Canada and a member of the Professional Engineers of Ontario.

W. H. McAloney Honored at Equipment Meeting

W. H. McAloney, superintendent of equipment of the Georgia Railway & Power Company, Atlanta, Ga., was elected president of the Southern section of the Electric Railway Association of Equipment Men at the closing session of a three-day convention held recently in Memphis. In his post as president he succeeds A. D. McWhorter, superintendent of the Memphis Street Railway, who has been president for five years, and who declined a sixth nomination.

Mr. McAloney is considered one of the leading equipment men. He took full charge of shops, carhouses and garage and assumed jurisdiction over the maintenance of all street cars and automobile equipment of the Georgia Railway & Power Company, Atlanta, Ga., about six years ago, when he filled the vacancy caused by the death of Mr. Moore. Sixteen years of his railway experience had been spent as superintendent of rolling stock of the Denver Tramways. While in Denver he was actively connected with the welfare association of the Denver Tramways. The latter city claims him as its own more than Atlanta because Mr. McAloney began work there for the Denver Tramways as a conductor in 1891, and after a few months of this work entered the office of E. W. Olds, at that time master mechanic. Later he was appointed division superintendent of the east division and still later to the shops as storekeeper. In 1902 he became superintendent of rolling stock, which position he held at the time of his resignation in 1918. It was in that year that Mr. McAloney was appointed superintendent of rolling stock of the Winnipeg Electric Railway. He remained in Winnipeg for two years, when he became associated with John A. Beeler, consulting engineer.

Articles by Mr. McAloney have appeared in the JOURNAL from time to time, dealing particularly with his experience and suggestions regarding various phases of railway equipment.

New Superintendent of Equipment at New Brighton

Henry J. Meyer, for the past 26 years master mechanic of the Beaver Valley Traction Company, New Brighton, Pa., has been promoted to superintendent of equipment for the Beaver Valley Traction Company, the Pittsburgh-Beaver Street Railway and the Beaver Valley Motor Coach Company, all with headquarters at New Brighton, Pa. Mr. Meyer is a member of the 25-Year Service Club, recently organized on the property, and in his years of experience has seen the advancement of the industry from the early days of electric cars to the present modern de luxe cars.

The new incumbent first provided money for his existence by working in a cigar factory at the age of 12. When asked why he selected transportation as his work, Mr. Meyer replied "because it is a good field of endeavor." In the general manager's bulletin issued as a weekly feature some complimentary remarks were made of Mr. Meyer's career. Service to the public and welfare of his company had been his constant thought.

H. J. Meyer

South Shore Line Appoints New Freight Representatives

Important changes in the personnel of the freight traffic department of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., were announced recently by F. W. Shappert, assistant to vice-president Bernard J. Fallon. A. W. Oberfell, formerly a commercial agent of the South Shore Line, was made general freight agent, and C. L. Binger, also a former commercial agent, was made assistant general freight agent. Mr. Oberfell's office will remain in South Bend, Ind., and Mr. Binger's headquarters will be in Chicago.

Mr. Oberfell has been associated with the traffic department of the South

Shore Line for more than a year, having previously been traveling freight agent of the Canadian Pacific with headquarters at Minneapolis.

Mr. Binger has served the South Shore Line since it came under its present management, having been associated previously with the Chicago, North Shore & Milwaukee Railroad.

Four "off-line" agencies were established in Minneapolis, Pittsburgh, Detroit and Kansas City, Mo. They are the first of their kind to be established by the South Shore Line and are a result of the rapid strides in the freight business of the road.

Personnel Changes on the Interstate Property

Changes in the personnel of the Interstate Public Service Company, Indianapolis, Ind., to become effective at the annual meeting of the company to be held on March 7, are as follows: President, Ernest Van Arsdel; vice-president in charge of gas, electric and water operation, I. L. Oppenheimer; vice-president in charge of railway operation, L. M. Brown; vice-president and treasurer, in charge of the financial department, W. Marshall Dale; vice-president and auditor, in charge of accounting and stores, A. D. Jones.

G. J. Oglebay, now district manager of the Bedford district, will go to the Indianapolis organization as assistant to the vice-president in charge of the gas, electric and water operation.

J. E. Albert in Charleston

J. E. Albert, recently affiliated with the Public Service Railway, Newark, N. J., is now serving in the capacity of assistant to Arthur M. Hill, vice-president and general manager of the Charleston Interurban Railroad, Charleston, W. Va., and president of the Midland Trail Transit Company and New River Transit Company. The latter two companies are purely intercity bus companies, while the Charleston Interurban Railroad operates several city bus lines. All of the companies are under the same management and control.

Early in 1926 Mr. Albert joined the ranks of the Public Service Railway as traffic engineer. For two years prior to that he had been assistant general manager of the Wheeling Traction Company, Wheeling, W. Va. Mr. Albert began his railway career with the West Penn Railways in 1916 while a student at the University of Pittsburgh. At that time he was engaged in valuation work. During the summer of the following year he again engaged in work for the West Penn.

Following his return to civil life after the war, he entered the special engineering department of the West Penn Railways, dealing with rates and valuation and the appraisal of electric and other properties prior to absorption by that company. He was also engaged on special reports covering arbitration of wages and similar subjects. He remained on this work until 1922. In that year Mr. Albert was transferred to the office of Vice-President C. P. Billings as assistant to that official. Two years later he was appointed to the position of assistant general manager at Wheeling.

As assistant to Mr. Hill, who has the entire responsibility of operating the railway and bus companies at Charleston, Mr. Albert is collaborating in working out important plans for that property.

W. A. MacRae Promoted in Toronto

W. A. MacRae has been appointed engineer of way of the Toronto Transportation Commission, Toronto, Ont., succeeding H. W. Tate, who has been promoted to the position of assistant manager. Mr. MacRae has been superintendent of construction in the way department since the summer of 1921, when the commission commenced its reconstruction and extension program, following the purchase of the property of the Toronto Railway. Prior to joining the Toronto Transportation Commission staff and since graduating from McGill University in civil engineering in 1913, he was engaged in general construction work.

New Commissioners Named in Pennsylvania

Emerson Collins and Samuel Walker have replaced Richard J. Beamish and Chris Golden as members of the Pennsylvania Public Service Commission following the rejection of the latter names on Feb. 1 and the submission of the two former by Governor Fisher. Both Mr. Beamish and Mr. Golden were appointees of Governor Pinchot. When the Senate finance committee met on Feb. 1 it decided to report negatively on the Pinchot men.

Emerson Collins, one of the new incumbents, is a resident of Lycoming County and was former deputy attorney-general. He taught school for a time, but left that work for the law, being admitted to the bar in 1887. He has since practiced in Williamsport.

Samuel Walker was admitted to the bar in Butler County in July, 1899. He is a graduate of the University of Pennsylvania law school. Mr. Walker resides in Butler, Pa.

The controversy provoked by the naming of Messrs. Beamish and Golden was the subject of comment in the JOURNAL at the time they were appointed.

Changes on Lake Shore Property

John Heim, Sandusky has been appointed superintendent of the city lines of the Lake Shore Electric Railway, Cleveland, Ohio, by Martin Ackerman, general manager. Mr. Heim succeeds Charles Coon, Lorain, who with P. M. Trueman, superintendent of the Toledo division, and Warren Gregg, superintendent of the Cleveland division, retired recently. Irving Robinson, Beach Park, was named to succeed Mr. Gregg and Sherman Gibson, Fremont, to succeed Mr. Trueman.

The three new incumbents have all been in the employ of the company many years. Mr. Heim's headquarters will be at Lorain, Mr. Robinson's at Cleveland, and Mr. Gibson's at Fremont.

Obituary

T. M. Jenkins

Thomas M. Jenkins, former railway official, died on Jan. 23 in St. Louis, Mo. Mr. Jenkins started his railway career as a driver of a horse-drawn car in Albany, N. Y., and worked himself up to the position of superintendent. For a while he was general superintendent of the Cincinnati, Newport & Covington Traction Company. He went to St. Louis, Mo., in 1900 as general manager for the St. Louis & Suburban Railway, then operated independently, but now part of the system of the United Railways, with which it was merged in 1906. Mr. Jenkins left the St. Louis & Suburban to enter the coal business as president of the St. Louis & O'Fallon Coal Company, St. Louis, owned by the Busch interests. In more recent years he headed the Regal Coal Company. Mr. Jenkins was born in Albany, N. Y., in 1862. As a youth he served as a page in the New York Legislature.

Col. H. G. Prout

Col. Henry G. Prout, internationally known engineer and editor, died on Jan. 26 at his home in Summit, N. J. His name was well known as a Civil War veteran, colonel in the Khedive's service in Egypt and as editor of *Railroad Gazette*, now the *Railway Age*. Colonel Prout succeeded General Gordon when that commander went down to Khartum as Governor-General of the Sudan. Mr. Gordon's opinion of him is shown by the fact that he had Colonel Prout promoted twice and at the end suggested him for the rank of Pasha and offered him the governorship of either of two provinces if he would stay in the service. When Colonel Prout returned to America in June, 1878, he entered the service of the Toucey & Buchanan Interlocking Switch Company, Harrisburg, Pa., which later became one of the constituents of the present Union Switch & Signal Company. After a year or so of this work, Colonel Prout entered the printing business with the firm of Atkins & Prout, which printed the *Railroad Gazette* for several years before Colonel Prout became editor of that paper in March, 1887.

During the next sixteen years, as editor of *Railroad Gazette*, Colonel Prout took an active part in railroad activities throughout the entire country. So great was the respect in which his judgment on engineering problems was held that an editorial written by him and read on the floor of the United States Senate influenced the selection of Panama instead of Nicaragua as th route of the Isthmian canal.

In 1903 Colonel Prout resigned editor of *Railroad Gazette* and as director of the corporation to become first vice-president and general manager of the Union Switch & Signal Company. In July, 1914, Colonel Prout, then president of the company, resigned, and in November of the same year became president of the Hall Switch & Signal Company, a position he held until his resignation and retirement the following year.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Rockford & Interurban Spends $100,000 for New Cars

Rockford & Interurban Railway, Rockford, Ill., has ordered ten interurban cars of the latest design from the American Car Company of St. Louis, at an estimated expenditure of $100,000. These cars will be operated out of Rockford on lines radiating to Beloit, Janesville, Freeport and Belvedere. They are designed for a speed of 60 m.p.h., and are expected to reduce the running time between these cities. The new rolling stock will be placed in operation in about six months, at which time will be instituted a door-to-door freight service through the medium of transferrable bodies, a service already successful on the North Shore line. Thirty of these bodies of 6-ton capacity are now being constructed in the company's shop.

$654,900 Budget in Minneapolis Includes 25 Cars

More than $600,000 will be spent by the Minneapolis Street Railway, Minneapolis, Minn., in 1927. The budget of the railway for 1927 having been approved on Jan. 28 by the City Council, materials will be bought and work will begin simultaneously on the various projects in the spring. Probably the most popular work is the new crosstown line on 50th Street from Xerxes Avenue to Bryant Avenue South, connecting the Oak-Xerxes and Bryant-Johnson lines, the first crosstown line south of Lake Street. This will necessitate double track from Xerxes to Penn Avenue South, terminus of the Oak-Harriet line, an extension of the Xerxes line, eight blocks, and a new double-track line from Penn to Bryant, fourteen blocks. A single track is to be laid on Penn from 50th to 54th Street.

Other projects include double tracks from 46th Avenue and 46th Street to and across the new Ford bridge over the Mississippi River, doubling the single track on 41st Street from 42d to 46th Avenue South, and on 46th Avenue from 41st to 46th Street, and on the Lyndale-Bryant Avenue North line from 42d Avenue to the city limits. Six other projects include new rails and paving between tracks and 25 new type noiseless cars. The total budget is $654,900.

Fifteen De Luxe Cars Ordered by Chicago, Aurora & Elgin Railroad

What is said to be a new type of de luxe passenger car will be introduced by the Chicago, Aurora & Elgin Railroad as a result of an order placed with the Cincinnati Car Company for fifteen motor-equipped passenger coaches to cost a total of $585,000 or $39,000 each. Delivery of these cars is expected about July 1.

The new rolling stock will be of all-steel construction, equipped with a combination straight and automatic air-brake system. Additional features will be triple-tier truck springs, 52 bucket-style seats upholstered in Byzantine plush, separate smoking compartment accommodating twelve persons, an elaborate toilet section, maroon exterior and mahogany interior finish. The cars, weighing 102,000 lb. each, are designed for high-speed operation and will carry four 150-hp. motors. Although the coaches will approximate in convenience and comfort the ordinary railroad parlor cars, there will be no extra fare charged.

According to a recent statement by Col. Edward J. Blair, general manager of the company, "these luxurious cars will give our customers transportation on rails which equals that of the appointments of the most luxurious private automobiles, in addition to the advantages which they now have of speed and highly skilled drivers.

"It is our desire," said Colonel Blair, "to give the western suburbs and Fox River Valley the best transportation to be found anywhere in the country, and this very large expenditure is in keeping with that. These cars will give the Chicago, Aurora & Elgin Railroad a considerable additional capacity to serve the public. We believe this distinct innovation in transportation will be pleasing to our customers, just as have been the other very large extensions and improvements which this high-speed, electrically operated railroad has made since the present management took charge more than ten months ago."

Party Lines Waived on Wooden Car Elimination

From latest reports Republican and Democratic legislators of New York City will make a determined effort during the present session of the Legislature to eliminate all wooden cars on subways and elevated lines in Greater New York. Senator Kleinfeld on Jan. 24 introduced a measure compelling the withdrawal of all wooden rolling stock within one year. Assemblyman Hofstadter announced that he was drafting a measure calling for the elimination of the cars, but had not decided to place a time limit on their withdrawal.

$2,720,000 Bus Order Placed by Philadelphia Rapid Transit

The Philadelphia Rapid Transit System has placed an order for 201 gas-electric buses with the Yellow Truck & Coach Company of Chicago at a total expenditure of $2,720,000. According to an announcement made public on Feb. 1, work has already been started on the new equipment, which will consist of 100 single-deck, 50 double-deck and 51 parlor car buses. The order also includes seventeen smaller gas-electric motor service units. With this new order delivered the Philadelphia company will have a total of 575 buses in operation. Delivery is expected in May and the buses, it is understood, will be used in developing new lines in and around Philadelphia.

In connection with the purchase of this new equipment the company has sold to Dillon, Read & Company a new issue of $1,900,000 equipment trust 5 per cent certificates which will be offered to the public shortly.

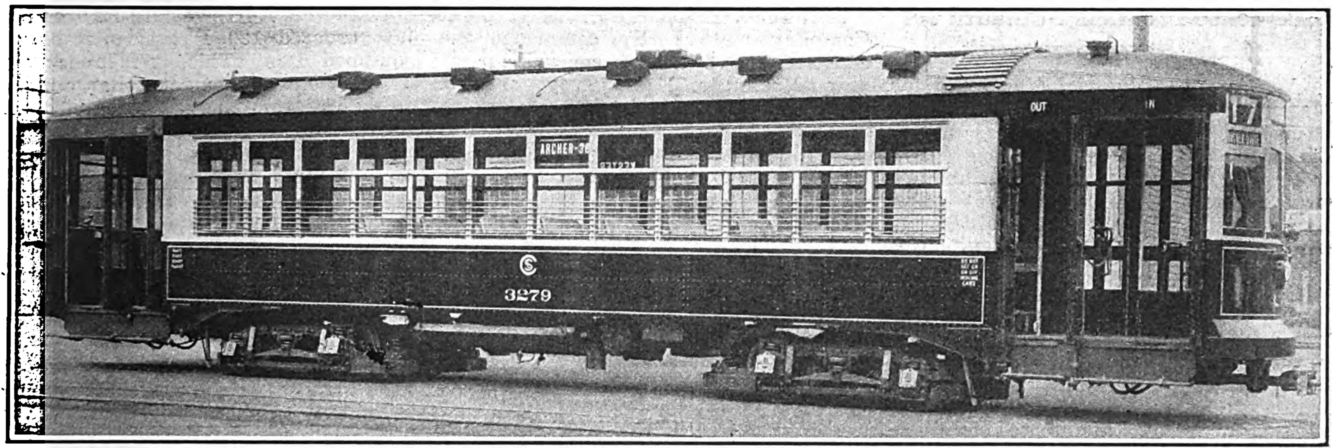
Electric Locomotive Shipments

December shipments of electric locomotives from principal manufacturing plants based on reports received by the Department of Commerce totaled 28 locomotives, as compared with 16 in November and 22 in December, 1925. Shipments for 1926 totaled 234 locomotives, as compared with 184 in 1925. The following table gives the shipments and unfilled orders of electric locomotives for each month since January, 1925:

ELECTRIC LOCOMOTIVES SHIPPED FROM PRINCIPAL MANUFACTURING PLANTS, 1925 AND 1926

	Shipments			Unfilled Orders End of Month		
Year and Month 1925	Domestic	Foreign	Total	Domestic	Foreign	Total
January	12	2	14	44	15	59
February	7	3	10	51	12	63
March	13	2	15	51	15	66
April	14	0	14	41	29	60
May	9	2	11	48	31	79
June	8	6	14	47	25	72
July	12	4	16	39	23	62
August	6	8	14	48	15	63
September	16	8	24	41	7	48
October	21	1	22	40	12	52
November	8	0	8	46	40	86
December	18	4	22	54	41	95
Total (year)	144	40	184	..	..	...

	Shipments			Unfilled Orders End of Month		
Year and Month 1926	Domestic	Foreign	Total	Domestic	Foreign	Total
January	11	0	11	53	42	95
February	22	2	24	60	40	100
March	11	1	12	50	41	91
April	12	16	28	44	29	73
May	14	9	23	46	23	69
June	11	3	14	53	20	73
July	20	0	20	36	23	59
August	16	7	23	26	16	42
September	13	7	20	24	11	35
October	15	..	15	20	13	33
November	15	1	16	27	15	42
December	17	11	28	14	8	22
Total (year)	177	57	234	..	..	...



Chicago Surface Lines Now Operating 100 Cars of This Type Built by Three Manufacturers

Brill Completes Delivery of 33 Surface Cars to Chicago

Information has just been received from the J. G. Brill Company of Philadelphia that it has delivered the 33 cars which were ordered by the Chicago Surface Lines last May. These cars were part of an order for 100 which was divided between the Cummings Car & Coach Company of Paris, Ill., the Brill Company and the St. Louis Car Company, St. Louis. They are practically the same design throughout as the 100 cars purchased in 1924, and described in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 15, 1924, page 837, and in the issue of May 27, 1926, page 908. The new cars are designed for multiple-unit operation, giving them the maximum flexibility between service of single two-man or one-man operation. Although general specifications for the entire order were carried in the ELECTRIC RAILWAY JOURNAL of May 22, 1926, specifications of the Brill order are appended as they differ to some extent from the original set as recorded in that issue:

Number of cars ordered	33
Date order was placed	May 13, 1926
Date of delivery	October 20, 1926
Builder of car body	J. G. Brill Co.
Type of car	Closed, 32 ft. 9 in.
Seating capacity	51
Weights:	
Car body	21,640 lb.
Trucks	11,470 lb.
Equipment	8,590 lb.
Total	41,700 lb.
Bolster centers, length	22 ft. 0 in.
Length over all	48 ft. 11 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 6 in.
Body	Steel and wood
Interior trim	Statuary bronze
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Axles	Carnegie
Bearings	Brill center, Stucki side
Bumpers	Channel
Car signal system	Consolidated
Car trimmings	Brill
Control	General Electric C-169
Couplers	Tomlinson
Curtain fixtures	Railway Supply & Curtain Co.
Curtain material	Fabrikoid
Designation signs	Electric Service Supplies Co.
Door mechanism	National Pneumatic
Wheelguards	H-B
Hand brakes	Dayton No. 35, drop handle
Heater equipment	Consolidated Car Heating Co.
Headlights	Trolley Supply Co.
Journal boxes	Brill
Lightning arresters	General Electric
Motors	Westinghouse 535A and GE-275-H, outside hung
Paint	Chicago Varnish Co.
Registers	International R-10
Sanders	Electric Service Supplies Co.
Sash fixtures	Edwards
Seats	St. Louis
Seating material	Cane
Springs	Brill
Step treads	Kass
Trolley catchers	Ideal
Trolley base	U. S. No. 14
Trolley wheels or shoes	General Electric
Trucks	Brill 39-E
Ventilators	Railway Utility
Wheels (type and size)	Rolled steel, 28 in. and 22 in

Oil Output Increases 3,415 Barrels a Day

Crude oil production again showed an increase last week, the daily average output rising to 2,364,204 bbl., an advance of 3,415 bbl. from the preceding week, it was announced this week by the *Oil and Gas Journal*. This total compared with a daily average of $1,915,960 in the corresponding week last year.

The jump is accounted for by increases in Oklahoma and California, production in the former state rising to 607,820 bbl. daily, compared with 597,825 last week and 443,540 in the corresponding week a year ago. California output rose to 653,500 bbl. from 648,500 last week and 611,000 a year ago.

The Texas Panhandle continued to recede and reductions were reported from many other fields.

The detailed production figures compare as follows:

	Jan. 29, 1927	Jan. 22, 1927	Jan. 30, 1926
Oklahoma	607,820	597,825	443,540
Kansas	115,815	117,710	98,985
North, Central, West Texas	236,443	232,065	162,080
Texas Panhandle	127,498	131,185	....
East Central Texas	44,366	45,261	62,510
N. Louisiana	53,370	53,630	43,410
Arkansas	128,950	130,830	159,500
Gulf Coast	160,950	171,613	98,820
Southwest Texas	39,337	39,830	39,025
Rocky Mountain area	69,155	85,090	97,460
Eastern	107,000	107,250	99,600
California	653,500	648,500	611,000
Total	2,364,204	2,360,789	1,915,960

Kansas City Citizens Petition Council for Track Extensions

A petition signed by 600 citizens was filed with the City Council of Kansas City, Mo., asking that the Kansas City Public Service Company be permitted to extend its Jackson Avenue car line from 24th Street South to 39th Street. A provision of the railway franchise provides for this extension, and it is thought that the petition will be given consideration by a special committee now conducting negotiations for the new franchise.

New Booklet Contains Valuable Track Data

Paved-track data are presented in an attractive manner in a looseleaf book just issued by the International Steel Tie Company of Cleveland, Ohio. The book is prefaced by excellent color reproductions of oil paintings depicting the manufacture of steel in Cleveland's industrial center.

Some historical facts are presented leading up to the greater use of steel ties in trackwork and the modern conception of their economy in the paved track of today. Many pages are devoted to the details of the twin tie featured by this company, and drawings are reproduced showing not only many typical track sections, but special construction and features relative to the product and uses to which it is placed.

Cost data collected from many actual jobs is detailed and presented on a unit foot basis. Interspersed with engineering and cost facts are many photographs and excerpts from technical magazines showing work in progress and opinions or descriptions of men prominent in the railway industry.

An interesting feature of the track notebook is the report of an investigation made by D. D. Ewing, consulting engineer and professor of electrical engineering, Purdue University, on the noise produced by cars operated over various types of track. Tests were made by Professor Ewing in Cleveland, Ohio, Schenectady, N. Y., and Harrisburg, Pa., in which noise and also vibration were measured by means of an inverted radio receiving set.

Conclusions of Professor Ewing based on the tests made in these three cities are that the type of tie has no appreciable effect on the noise incident to car operation, and also that noise is a function of car speed. Data and charts measuring the noise in the several tests are reproduced.

The book closes with several tables of standard and special handbook data. The looseleaf feature allows of the continuing growth of the book as additional sheets are sent out by the company or by the addition of individual notes.

Haskelite Products Standard for Cars, Says Fitzpatrick

Writing in *Industrial Marketing* for January, 1927, James R. Fitzpatrick, secretary and director of sales of the Haskelite Corporation of Chicago, gives a graphic account of how his company was forced to seek other fields when ten days after the armistice orders on its books for airplane equipment amounting to $1,080,000 were canceled. Of particular interest is Mr. Fitzpatrick's outline of the reasons which led the company to invade the electric railway field. "It is generally accepted as true by practical street railway operators," he writes, "that it costs 6 cents a pound per annum to operate a street car, exclusive of passenger load. For a number of years the engineers of this field had been endeavoring to procure a light-weight street car. We decided this was our field.

"The result of our tests and efforts is that Haskelite products are today accepted as the standard in street car construction. A $\frac{1}{4}$-in. Haskelite roof replaces a $\frac{3}{8}$-in. or $\frac{1}{2}$-in. lumber roof; a $\frac{1}{16}$-in. or $\frac{1}{4}$-in. Haskelite panel replaces a $\frac{3}{8}$-in. composition board headlining; a $\frac{1}{4}$-in. Haskelite panel replaces solid lumber for interior trimmings; a $\frac{7}{8}$-in. Haskelite plywood floor replaces the $1\frac{1}{4}$-in. solid lumber floor; a $\frac{5}{16}$-in. plymetl replaces 12 to 16-gage steel for outside panels."

According to Mr. Fitzpatrick, the Chicago Surface Lines, Pittsburgh Railways, Detroit United Lines, Los Angeles Railways, Chicago & North Shore, Market Street Railway of San Francisco and Grand Rapids Railway are some of the large operators who make free use of Haskelite plymetl in the manufacture of their cars. Mr. Fitzpatrick also states that the company's products are standard in the manufacture of buses by the American Car & Foundry Company, Yellow Coach, Mack International, Garford Motor Company, the Six Wheel Company and others.

Rolling Stock

Reading Rapid Transit Company, Reading, Pa., has recently turned out another steel-framed car of the "800" type from its shops. Another car of this type is at present under construction and will be ready for service within a few weeks.

Cleveland Railway, Cleveland, Ohio, has approved a program of expenditures totaling $2,050,000. Among the items included are new cars and buses to the probable extent of 100 cars and 25 buses.

Key System Transit Company, Oakland, Cal., spent upward of $400,000 in trackwork in Oakland, Cal., during 1926, according to the company's report, just released. Forty new cars of the 900 type were added to the rolling stock and this type is now standard for the system. Twenty-seven new buses also were purchased at a cost of $238,997. The total expenditures for improvements during 1926 are set at nearly $4,500,000.

Milwaukee Electric Railway & Light Company will shortly commence the construction of de luxe coaches for its new Burlington-East Troy service. They will be built in the company's shops and along the same lines as those now in use on the Milwaukee-Waukesha-Watertown rapid transit line.

Shops and Buildings

Portland Electric Power Company, Portland, Ore., has completed improvements of its Jefferson substation which was started in 1925. The work involved an expenditure of about $250,000 and consisted of a 34x100 ft. extension which was erected while the plant was in constant operation. Provision has been made for housing 15,000 kw. in primary distribution transformers, 3,000 kw. in railway rotary converter transformers, switching equipment, distribution feed regulators, and a water cooling system for the transformers, etc. The station supplies some of the west side overhead feeders and also current for the underground feeders in the downtown district.

Illinois Traction System, Peoria, Ill., has sold to the Union Electric Light & Power Company, subsidiary of the North American Company, its Venice, Ill., power plant. Under the terms of the sale contract the Illinois Traction Company will purchase power from the Union Electric for a period of twenty years. The Illinois Traction Company is affiliated with the Illinois Power & Light Company, which operated the Venice plant. The Venice power plant is at the east end of the McKinley Bridge over the Mississippi River. It was built about twenty years ago, but within the past two years it has been modernized.

Trade Notes

Armco Culvert Association is the new name for the Armco Culvert & Flume Manufacturers' Association, effective Jan. 1.

Oil Jack Company, Inc., New York City, manufacturer of the Pederson "oiljack," is now located at 15 Park Row, having formerly had general offices in 110 West 40th Street.

Metal, Coal and Material Prices

Metals—New York	Feb. 1, 1927
Copper, electrolytic, cents per lb	12.75
Copper wire, cents per lb	15.125
Lead, cents per lb	7.40
Zinc, cents per lb	6.92
Tin, Straits, cents per lb	66.50
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.075
Somerset mine run, Boston, net tons	2.525
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N.Y., cents per lb.	17.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb	10.9
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.82

Chicago & Northwestern Railroad has just ordered 120 Hyatt roller-bearing equipped cars. This, it is understood, is the largest order for roller bearings on record from the railroad field. The Hyatt company also reports that the Rock Island Railroad recently started an extensive test program on fifteen cars, specifying Hyatt roller bearings in connection with the experiments.

Relay Motors Corporation, recently incorporated to take over all assets of the Commerce Motor Truck Company of Ypsilanti, Mich., and Service Motors, Inc., Wabash, Ind., has announced the following officers for the amalgamated company: W. R. Bassick, chairman of the board of directors; G. L. Gillam, president; M. A. Holmes, vice-president; A. K. Cabel, secretary and treasurer; E. W. Bassick, director of policies. The new company will still manufacture the relay drive for trucks, which it considers one of the leading developments in the truck and bus fields.

A. B. Foster Company has recently opened its Chicago office at 231 La Salle Street, in charge of R. A. Foster, vice-president of the company.

Elliott-Fisher Company has acquired the business of the Sundstrand Corporation, manufacturer of Sundstrand adding, bookkeeping and calculating machines, with factories and general offices at Rockford, Ill. The Elliott-Fisher Company manufactures accounting-writing machines and has factories at Harrisburg, Pa., and general offices in New York. The latter company desired to supplement its line with equipment for the adding-bookkeeping field, and for that reason acquired the Sundstrand organization. The products of the two constituent organizations will be marketed by the General Office Equipment Corporation, a subsidiary of the Elliott-Fisher Company. The same officers of the General Office Equipment Corporation continue in the management of the organization, with executive and general sales offices at 342 Madison Avenue, New York.

The White Company, Cleveland, Ohio, announces a new sales district organization for its motor truck and buses with headquarters at 1045 Atlantic Avenue, Brooklyn, N. Y., as the result of separating the Brooklyn territory from the New York district. William McDaniels, formerly Brooklyn division manager, has been appointed district manager, and F. H. Laning, formerly of the home office in Cleveland, assistant district manager.

H. T. Heath, who is well known in the electric railway and automotive field of the Middle West, is now with the Illinois Motive Equipment Company, Chicago, Ill. Mr. Heath will handle sales and service of Johnson fare boxes in the Middle West. He was formerly connected with the Electric Devices Company, Hageman-Castle Corporation, Westinghouse Electric & Manufacturing Company and the Detroit Railway Supply Company.

Arthur F. Connally, formerly connected with the Goodrich Tire Company, has accepted the vice-presidency of the Millisco Advertising Agency, with headquarters in 1 Park Avenue, New York City.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, February 12, 1927 *Number* 7

Why Not Call It Popular Transportation?

IN DISCUSSING the transportation of people to and from their homes and places of business, the term "mass transportation" has come to be generally used. Unfortunately this is an apt description of transportation standards forced by the rates of fare permitted in most American cities. People are moved as masses instead of as individuals, and the standards usually applied to the treatment of the individual have been completely abandoned in the continued effort to move humanity in the bulk at the lowest possible cost.

Hope for the future lies in a gradual awakening on the part of the public and a demand for something better in transportation at an appropriate price. But even under existing conditions, the common use of the word "mass" is an unhealthy influence. Why not substitute "popular"? We use this word generally when referring to the price of a service or commodity which is in the reach of everybody. "Popular transportation" seems more appropriate and tends to create a slightly improved conception of the job we are trying to do than does "mass transportation."

Hysteresis Is Characteristic of Many Electric Railways

STUDENTS of physics are familiar with the phenomenon of lag in electro-magnetism, known technically as hysteresis. In a different form this lagging tendency seems to afflict a considerable number of electric railways. They are just now starting to do what the leaders of the industry did several years ago. They have not yet begun even to think about the things the progressive companies accomplished during the past twelve months. Two or three years from now, if all goes well, they may consider the adoption of these improvements.

For example, the management of a certain railway recently decided that money could be saved by the use of a simplified scheme of exterior decoration on its cars —a one-color background instead of the former two-color arrangement, with less striping and lettering. This policy is completely in accord with the general thinking of the electric railway industry several years ago, but apparently disregards the recent change in outlook. Today the best thought of progressive managements is being devoted to increasing the attractiveness of the cars rather than to saving money in painting. Steam railroads and electric railways are pursuing similar policies. Cars and locomotives are being painted in distinctive designs. Dull, drab colors are being abandoned in favor of bright, cheerful hues. At Saginaw and Grand Rapids the local railways have gone so far as to vary the scheme of decoration on individual cars. To give rolling stock an attractive appearance it is not necessary to spend large sums. For a little more than the minimum, if the money is judiciously used, a pleasing effect can be obtained. Those who have done this find it pays well.

The chief sufferers from the more or less prevalent tendency to lag behind the times are the companies following the policy. To some extent, however, the effect extends beyond them and hurts the standing of the industry as a whole. While it may be a safe policy to adopt no improvements until they have been tried out for several years by others, such a course shows lack of the kind of courage which leads to success.

Syracuse Goes to a New Fare Schedule

CASH fares on the New York State Railways in Syracuse are to be raised from 7 cents to 10 cents. Ten tickets will be sold for 75 cents. In so deciding the Public Service Commission has ruled on a case that has been before it for some months. As the commission sees it the company exhausted every reasonable expedient in endeavoring to effect economies so as to continue operations at the rates fixed by the commission in 1921.

There was no formal fixation of valuation, but the commission ruled that the rates asked by the petitioner would in no event be unreasonable. It estimates the increased revenue due to the increase in fare at $346,023, based on the figures for the year ended Sept. 30, 1925. This estimate took into consideration the possibility of a 2 per cent decrease in the number of car riders due to the change in the fare schedule. There is no note of censure in the comments of the commission in rendering its decision, but the chairman refers to the complex and involved corporate consolidations which culminated in the formation of the present company. This matter is not easy to follow in its ramifications. It is apparently a case in which the recent recommendations of the A.E.R.A. committee on finance might well be heeded.

Fares have been changed a number of times in Syracuse since 1918. Prior to Nov. 26 of that year the fare was 5 cents. It was then increased by the Public Service Commission to 6 cents and in 1921 it was made 8 cents with four tickets for 29 cents and children's fare of 4 cents. On application of the city the fare was reduced on Oct. 1, 1922, to 7 cents. The commission says that the earnings now represent less than a 4 per cent return and that the new rate authorized is likely to return considerably less than 8 per cent.

The opinion of the commission may well be perused with profit by managers elsewhere, but the principal interest in the decision would appear to lie in the fact that the case represents an apparently sincere effort of a company operating 98 miles of line in a city of 170,000 population to make its lines self-supporting under the economic conditions changed materially from those which prevailed as recently as 1918. There is no question about the right of the company to a fair return upon the value of its property dedicated to public use, but it will be interesting, in view of previous fare changes in Syracuse, to follow the course of earnings under the new scale.

Cutting the Cloth Too Close Produces a Dissatisfied Customer

EXCESS service—cars too lightly loaded—is properly considered a sign of inefficient railway management under ordinary circumstances. To correct such a condition schedules are trimmed. That, however, is a job for an expert and evidence is not lacking that some railways employ unskilled cutters.

For example, take the case of a railway which some time ago lengthened its Sunday headways on certain lines. Every car now carries a small standing load. That may be a source of gratification to a management hard pressed to make both ends meet, but it is a source of much annoyance to the passengers. In the end it will surely prove to have been poor economy.

Probably every passenger who has to stand spends his time thinking dark thoughts about that railway. Next time he goes out on Sunday, he says to himself he will use some other means of transportation. If he carries out this resolve, and very often he does, he may be lost permanently as a railway patron. In any event he is a dissatisfied customer and an easy convert to the doctrines of the demagogues who rant against the traction interests.

In general, the public understands that in rush hours electric railways cannot be expected to provide a seat for every passenger. Those who do not have to travel at such hours have the choice of putting up with the crowding or travel at some other time. Those who must, continue to ride despite crowding. In the middle of the day and on Sundays and holidays, on the other hand, there is little excuse for making passengers stand. At such times the railway patrons ride from choice rather than necessity. Unless the service is reasonably frequent and comfortable, they will be discouraged from riding. The money saved by cutting schedules will go to pay the high cost of short rush-hour peaks, and the last state of that railway will be worse than the first.

Adopting the Manner When the Spirit Is Lacking

COURTESY, co-operation and like actions which depend for their effectiveness on the personality of the individual are keynotes of policy in the transportation industry today. To some men politeness and helpfulness come naturally; to others they do not. Yet it is imperative that the public be treated with courtesy at all times—not merely when dealing with a man who is polite by nature. It behooves the management of a transportation company, therefore, to devise means of inculcating a spirit of courtesy and co-operation in all its employees.

Where and how to begin is a problem. Speaking particularly on "co-operation" at a recent meeting of the Metropolitan Section, American Electric Railway Association, G. T. Geer, secretary of the Third Avenue Railway, New York City, suggested the adoption of the proper manner, even when the real spirit is lacking. Going through the motions of co-operation or being courteous gets to be a habit, he said, and in time begets a sincere desire to co-operate and to be courteous. Undoubtedly there is a good deal of truth in this theory, and it furnishes a tangible starting point for training. If a man who is otherwise a valuable employee lacks a naturally courteous manner, he can at least be taught to adopt its outward form. Later, it is to be hoped, he will catch the genuine spirit.

Danger lurks in this plan, however, as it is possible that the man's development may stop with the mere adoption of the outward form. Courtesy that is only skin deep is little better than none. As a beginning, it may be said to be a step in the right direction. But before it really can count for much it must come from the heart.

Service at Cost—or at Less than Cost

ENLIGHTENING in that they illustrate the wide range of thought possible on the economics of service at cost are two communications published elsewhere in this issue. They followed from an article in a St. Louis newspaper purporting to be an interview with delegates attending a convention of some seven economic societies meeting in that city early last month. Unfortunately the article presented only the views of those apparently antagonistic to the theory on which is based the franchise now being negotiated between the city and interests attempting to reorganize the United Railways of St. Louis. Diametrically opposed views from equally capable economists were omitted.

In his communication Prof. James C. Bonbright of Columbia University corrects certain misstatements in the newspaper article and then advances a theory that a contract once entered into relative to the rates for service must survive, even though one of the contracting parties be financially wrecked. From the arguments advanced by him it would appear that the cars and rails of the system were in some peculiar manner a party to the contract, rather than the corporation owning the physical plant. Many of the present troubles of electric railways are due to politicians holding the same view.

On this theory, the greater portion of the investment would cease to have any value in case a contract proved unprofitable. It is not sound economics to insist on the last pound of flesh in requiring the fulfillment of a contract which common sense shows cannot be carried out. The successful issue of both mortgage bonds and stocks depends on earning power over a period of years, and this is subject to changing conditions that cannot be prognosticated accurately long in advance. But to attract capital and provide a satisfactory service rates must be such as to give an adequate return on the money prudently invested in the enterprise. On Professor Bonbright's theory the purchaser of either bond or stock must for his own protection demand a higher margin of safety or a larger rate of return lest the fixed rates prove unprofitable and destroy the earning power. It is on a basis such as this that he believes a cost-of-reproduction valuation is too high on general principles.

L. R. Nash, on the other hand, contends that both the city and the company entering into a contractual relation bear definite responsibilities. The company renders a service that the community wants. If the community is not willing to bear its share of the cost of service, then "what it seeks is not service at cost, but service at less than cost."

That regulated utilities must be permitted to earn adequate returns in exchange for good service is a principle so generally accepted today that expressions of opinion such as that typified by the Bonbright letter, similar in many respects to the opinions of Prof. Robert Hale and John Bauer, who also contributed to the St. Louis newspaper article, seem to savor more of miraculously attempting to extract the "pound of flesh" than of expounding real economic theories.

Aside from the ill effect on a community arising from the expressed views of economists such as those gentlemen visiting in St. Louis, it is alarming to realize that the young men of our colleges, studying the rudiments of business, may be exposed to such unsound theories that cannot stand the acid test of practice. Such views are not in accord with the preponderance of evidence evolved from successful business methods, and they run counter to the many Supreme Court decisions that have been the milestones that have guided the industrial growth of our nation.

Car Replacement Awaits Manufacturer Initiative

GROWING interest in the improvement of equipment is evident throughout the electric railway industry. Better appearance, reduced noise, more comfortable seating, streamline painting, use of floor coverings, easier riding trucks and other elements which add to the attractiveness of an electric railway ride are being actively discussed by operators both individually and in committees. The general tendency to experiment with the rebuilding of old cars is merely another indication of the widespread conviction that car improvement is an essential and necessary requirement of the industry.

In many cases, unwise expenditures are being made for rebuilding old and heavy equipment, when the difference in cost for new cars could be financed out of the savings which new cars would make in operating and maintenance costs. But in the very fact that so many old cars are being rebuilt there is a challenge to the ingenuity, courage and business foresight of the car builders. Electric railways are genuinely interested in the advantages of improved equipment. In many cases, however, the advantages of new equipment are not sufficiently evident to overcome the attachment which some properties seem to have for their old cars. In some respects this hesitation is justified by the fact that manufacturers have failed to foresee the need of the times or adequately to interpret this in the development of their product.

The days of just building cars to meet the ideas of the customer are going rapidly. The customer has ideas, of course, but in the past the car builder has dodged the full responsibility of a manufacturer by merely operating as a contractor to build according to the customer's ideas. The plea in defense of this practice has been that the customer insisted on having his own way. That may all well be true, but there is ample basis for concluding also that the manufacturer has not been reluctant to yield to the customer's views, even when he knew better, as a means of dodging the responsibility which every producer should assume as to the performance of his product and its suitability for a particular service.

Discussion of this subject with many operators who have had the reputation of insisting on their own designs shows no widespread belief in the wisdom of this practice. The usual view expressed is that the manufacturer has had little to offer, except possibly a design developed by some other railway property, and that consequently the operator has had no choice but to accept another operator's design or to specify his own. In some cases, railways which have been in the habit of building their own equipment point out that they do not believe in this practice as a sound business policy, but have built their own cars because the manufacturers had nothing better to offer.

Doubtless there are things to be said in defense of the car builder's viewpoint. The subject is a critical one to the industry and is deserving of the fullest and frankest discussion. The foregoing is not intended as a full analysis of the situation from both sides. It presents primarily the railway viewpoint. But the responsibility for bringing about improvement in car building and car merchandising practice rests with the manufacturer. The present widespread tendency for railways to spend money in rebuilding heavy, awkward cars is a challenge to the advantages of new equipment. It is up to the manufacturers of the industry to push ahead with such a program of car design improvement, that the advantages of replacement instead of rebuilding will be evident to even the most precedent-bound executive.

Co-operation with Police Means More than Mere Friendliness

JUSTIFICATION often is lacking for the claim that a fine spirit of co-operation exists between the local police department and the operating personnel of the street railway. Actions, rather than words, are the true evidence of a desire to be mutually helpful. Traffic officers and platform employees may outwardly be on a very friendly basis, without the existence of any real co-operation.

As far as it goes, it is a fine thing for the police commissioner to be on good terms with the general manager of the railway; to sit in his office, smoke his cigars and talk over the traffic problems. Similarly it is a fine thing for Bill, the motorman, and Jim, the traffic officer, to exchange pleasant greetings at the beginning of their day's work. But this friendliness, if it stops there, really fails to facilitate the movement of street cars or other vehicles.

At a busy intersection the expeditious handling of traffic depends largely on the skill of the individual policeman on duty. Automatic signals have not eliminated his influence. Establishment of traffic regulations is beyond his control, but enforcement of them is equally important, and in that he stands supreme. Whether a street car crosses at the end of one movement or must wait for the beginning of the next depends on a gesture of the traffic officer. Left-hand turns of vehicles can be so controlled that little interference with other movements is caused, or they may be allowed to block the entire intersection for the time being.

Back of this work of the individual policeman lies the attitude of the department and the municipal authorities. There, too, the need exists for more than a spirit of mere friendliness. Railways do not seek favors, but only fair treatment, based on a true concept of the relative importance of various vehicles in the general transportation scheme. By all means let friendly relations be fostered, but let the matter not stop there. Let the co-operative spirit be transmitted into active co-operation.

Our Primary Interest Lies in the Upbuilding of Our Communities*

Greater Co-operation Is Needed Within the Industry—Transportation Will Prosper and Progress Only as It Plays a Proper Part in Civic Development—Better Facilities and Service at Adequate Rates of Fare Benefit Both the Transportation Companies and the Communities They Serve

By W. H. Sawyer

President American Electric Railway Association

NO ONE can question but that an industry like ours needs and must have a national association. There is no question in my mind but that there is a definite need also for the Central Electric Railway Association. No one at the end of such a meeting as you have had today can doubt this. It has been a real inspirational meeting, and I say, more power to you. You get really closer to your definite local problems than we do in the national association. The stronger you make the Central Electric Railway Association the stronger should be our national association.

I happen to be temporarily—for one year only—the president of the American Electric Railway Association. I have certain definite thoughts as to what might be done to make this association an even stronger organization than it is today. I have asked the proper committees to review all of the activities of this association. Immediately, however, there is a thought to preserve inviolate past practices and traditions. If what is proposed to be changed is wrong, I want it to stand or fall on its merits. I am not content to continue certain practices just because they have been the past procedure. I believe I would not be faithful to my trust if I did not ask for a thorough review and analysis of all the acts and doings of this association. This is a business association, to be operated on business principles, and changes are naturally necessary in any business organization. I do want it thoroughly understood, however, that the discussion of any such changes is purely impersonal. When we get all through with our studies we may make few changes, but at least we will be able to assure the industry that all work of the association is on an effective and economical basis.

OPPORTUNITIES FOR IMPROVEMENT ALWAYS EXIST

It is my belief that by reduction of duplication and by co-ordination of all facilities of the industry, we can have an association which will do better work on a more economical basis. In that thought I may be wrong, but when next October comes around and the American Electric Railway Association goes before the industry for increased dues, I want it to be as nearly as practicable on a co-ordinated, economical and unassailable basis.

Between now and next October the finance committee, the policy committee and the committee on revision of constitution and by-laws will make their reports. It appears now as if all three of these committees would recommend changes. I recognize, as I said before, that I am only temporarily president and that this association is your association. All I am doing is giving advance notice, as it were, that I am one of those who believe we can do a better job than we have been doing. I consider this no criticism of any past official or past action of our association.

All of us on our own properties are looking over our hands and are doing things differently today than we did even one year ago. All I am asking is that we do the same thing with our American Electric Railway Association. On our own properties we sit around the board and discuss changes. We at times differ widely, though honestly. Eventually we come closer to one accord and take a progressive step. That is all I expect in connection with the American Electric Railway Association. I want to have its activities analyzed and discussed openly, freely and frankly, and then let us all be of one accord, working together for the industry which means so much to all of us.

CLEVELAND CONVENTION PROMISES TO SURPASS LAST YEAR

Now, just a word about the Cleveland convention and our friend Colonel Alexander, because I cannot think of one without thinking of the other. The colonel is giving us real co-operation. I have his word for it, and I believe in him when he says that he will give us a street car exhibit far better—both as to quality and quantity—even than the street car exhibit of 1926. Your own Harry Brown has charge of the program and it is to be of the conference-discussion type, rather than set speeches.

Some of you felt that it was a mistake when we came back to Cleveland. I appreciate that Atlantic City is one of the best convention cities, if not the very best, in the world. But Atlantic City this year could offer us practically nothing except the pier, as we had it in 1925, and a temporary building. We could not have held in Atlantic City this year a real street car exhibit, and such an exhibit is at this time, I believe, essential and necessary.

CAR EXHIBIT WAS INSPIRATION

It was an inspiration to me; it was an inspiration to many at Cleveland actually to see all those modern cars, which had been purchased by hard-headed business men who considered them essential in merchandising their service. We had talked a great deal and had read about companies that had been successful in modernizing their equipment, but here we had actual examples before us of what had been accomplished. I do not believe that any man went away from that convention without something closely akin to an inspiration and a conviction that modernized equipment does pay, is worth while, and, in fact, is necessary to meet today's conditions. That is the primary reason why the convention will again be held at Cleveland, and I hope that those of you who will miss your stroll on the boardwalk will bear that in mind and line up with us to make this street car exhibit a further inspiration and a greater success.

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*Abstract of address before the Central Electric Railway Association at Toledo, Ohio, Feb. 3, 1927.

Pride Goes with Proper Service

STREET car lines which are to continue to function as community enterprises must be modernized. Transportation practices must be on a merchandising basis. We must have a pride in the service we have to sell, and the community which buys our service must have a pride in it.

Right in this connection, in 1926 there was one street car manufacturing company that built one street car on its own initiative and sent it to Cleveland at its own expense. Just compare this situation with the bus manufacturer. True, they are not fairly comparable, but there is more than an opportunity for thought as to the necessity for initiative on the part of the car and equipment manufacturers.

Equipment Improvements Are Needed

These manufacturers are my brothers, as it were, and I feel closely akin to them, but owners, operators or manufacturers cannot be successful if we are to continue along lines which were prevalent ten or more years ago. We operators are attempting to meet the changed conditions due to privately owned automobile competition by making our service so appealing to automobile owners that more of them will of preference take our street cars. Our manufacturing brothers appreciate our situation and are endeavoring to satisfy us, but we need every ounce of help that they can give us, every ounce of initiative.

A short time ago I looked over some drawings of an axle with its accessories, which at first thought is almost revolutionary in the street car industry. I do not know whether the axle is practicable, but the manufacturer's representatives told me that they believed in it and proposed to give it a thorough test and demonstration, and I do know that I felt encouraged by the initiative shown by them and this evidence of their faith in the future of the electric railway industry.

Transportation Executives Have Responsibility to Community

There are today only comparatively few communities which are not to a greater or lesser extent handicapped by the fact that they have not as good transportation service as the needs of the community warrant and it is the duty of every electric railway executive to do all in his power to remove that handicap so that his community may grow and prosper. Transportation executives have a definite responsibility to their community to a greater extent, probably, than the executives of any other industry.

We discuss the competition from the privately owned automobile. It is real competition, which will continue to become more severe, nationally speaking. This competition makes it more difficult for the electric railway company properly to take care of the needs of the community, but public transportation still remains a necessity. Some one is going to continue to operate electric cars and buses as a part of our public transportation systems. Don't ever get away from that thought: Public transportation still remains and will continue to remain a community necessity.

You know the situation; I know the situation, but we have not yet sold to our public, our customers, the facts regarding the problem. We are a part of the community, an essential part, a life-giving part. We understand and recognize that fact, but too few of us have as yet convinced our communities of the necessity of actual, real, helpful co-operation with their electric railway companies.

I have not accomplished my own desires in this respect; I could do much more for the communities in which I operate than I am doing, if I could only win real co-operation. I have not yet sold to these communities the thought that by co-operation we can both merit and achieve success. It is one of our primary duties to sell ourselves and our companies to our communities. We know the needs of our communities from a transportation standpoint better than anyone else. We know what we can do for our community if given the opportunity.

How are we going to fulfill our duty to our community? If we expect justice to prevail with only a nominal effort on our part, we will be sadly disappointed. The community must eventually pay the cost of transportation service. Eventually it will see the light and eventually transportation will be brought up to the needs of the community. But the longer that "eventually" is put off the more we will suffer and the more our communities will suffer. We must meet this community problem more than half way. We cannot be content with simply stating the facts. We must prove to our communities in a manner more forcible than most of us have done, that in spite of all the handicaps of the day we can and will give them satisfactory service if we can but have their co-operation. To continue to give the same kind of service and to use the same kind of vehicles that we did fifteen years ago is not very convincing. Street car lines which are to continue to function as community enterprises must be modernized. Transportation practices must be on a merchandising basis. We must have a pride in the service we have to sell, and the community which buys our service must have a pride in it.

Improved Facilities Pay

What companies are making the most distinct headway as to this community problem? Is it those companies that are staying in the rut and are not meeting the changed conditions of today with changed methods and changed equipment? Which of our companies are showing the greatest improvement in their balance sheets? Look over the list of Coffin Prize awards and Coffin Prize contestants and there is emblazoned the answer: The North Shore Line, the Northern Texas, the Pittsburgh Railways, the Penn-Ohio, Dallas, Grand Rapids, Buffalo & Erie, Interstate and many others. It is among this class of companies that you find men who are succeeding in their duty to their communities. It is this class of companies, owned and operated by men with vision, that are making better showings in their balance sheets.

Let me speak even more bluntly. I know that an appreciable portion of the present electric railway trackage is going in the discard. I personally know right where some of those lines are, but I also know that there is nothing to be gained by drilling our hard-luck stories into each others' ears. I also know that a continuance of past practices is not going to save our investments. I do not know just what should be done, but I do know that a large number of us must do differently than we have been doing or we are not going to save these investments. I also know that those companies that have been the most progressive in their changed methods are, as a class, making the best financial showing and stand out definitely in a class by themselves. Give heed, ye doubting executives, to the facts and figures so forcefully arrayed by Charlie Gordon.

Good Service More Important than Low Fares

There is one other phase of our community problem requiring not only salesmanship but courage. Good service is of far greater importance than low fares. I have pointed out that the elimination of public transportation service is unthinkable. Poor service means community stagnation. The community will eventually pay for no service or poor service the highest price of all—its very life. But let us take the average case of today where the community pays 7 cents for what should be 8½ cents service and progresses even though thus handicapped. There is no question in my mind but that the community would be the gainer if this service, economically and progressively administered, was appreciably increased in quality and quantity, and the fare also increased to meet the cost. The charge must equal the cost of the service. That is true of any business anywhere, but the particular point I am stressing is that the community, if it is to grow and prosper on a sound economic basis, needs even better transportation than is on the average being given today—and therein lies another duty of our industry to our communities. I believe in a 10-cent fare and in a 10-cent service, because I believe that under the conditions of this day and age the few extra pennies spent for car fare would contribute many-fold to civic development and prosperity.

Too Much Loose Talk on Buses

Now, just a few words about buses. There has been entirely too much loose talk about the bus eliminating the street car. I have in mind particularly the Chicago situation, which is local unto itself, political and chaotic. Nothing new, supernatural or mystical has happened within the last few months to warrant those who previously definitely advocated co-ordination completely to reverse their position and now advocate wholesale substitution; that is, there is nothing except selfish, mercenary motives. I have no hesitancy in saying that I do not believe that any thinking man who is familiar with the situation believes that the Chicago settlement is going to be on the ridiculous basis of eliminating the electric street cars. That would not be building up a community. Such a thought is not only contrary to all transportation experience, both here and abroad, but is particularly contrary to the experience in Chicago itself, where during 1926 the street cars showed an appreciable increase in passengers while the buses showed an appreciable decrease. In St. Louis the bus is not holding its own. Few responsible bus companies anywhere are making money from operation. There have been too many buses sold under high-pressure methods and used for blackmailing purposes. The use of a bus as a novelty and for joy-riding is wearing off. The glamor and air of luxury are short lived.

In spite of these facts, I want to say again, as I have said for a number of years, that we want and need the bus; that there will be many more buses used in the future than there are today, and that those buses will be co-ordinated with electric railway service by the community builders.

The electric railway operator has in the past used the word "co-ordination" with too little meaning. We have not a co-ordinated bus service simply because we are operating some buses. Neither the bus manufacturer nor the electric railway operator has been building for the future to the extent that it behooves us both to build. These large electric railway investments cannot be further jeopardized without definite loss to the communities. The electric railway executive cannot welcome the bus manufacturer who undermines those electric railway investments just for a temporary sale of today.

What I am saying is that although during the past few years we have shown definite progress toward co-ordination and co-operation, we see a clearer picture today than we did even a year ago and we should now get down to real co-operation and real co-ordination. We men who were primarily electric railway operators are perhaps slow moving and peculiar unto ourselves, but the bus manufacturer can afford to be patient with what appear to be our shortcomings.

Real Co-ordinated Transportation Needed

You bus manufacturers are here tonight because you are a part of this industry, and I believe it is essential and necessary for the prosperity of your business, of our business, and of our communities that we really work co-operatively.

Now, I have talked about the need for more buses, and have in a friendly way made suggestions to the bus manufacturers. I have also talked about the need for modernized car equipment and have in effect made suggestions to the electric car and equipment manufacturers. These two thoughts are not opposing. They are both included in the thought that we all owe a duty to our community and that we can best serve its development if it will but give us the needed co-operation toward a really co-ordinated, modernized electric car and bus transportation system, such as we can give it if we all work together.

Part of the fleet of 23 Mack six-cylinder gas-electric buses operated by the Capitol District Transportation Company (United Traction Company) on the 3¼-mile Albia route, Troy, N. Y. This view was taken in front of the Albia Garage, formerly the carhouse, near the outer end of the route.

Buses Meet Severe Operating Conditions in Albany and Troy

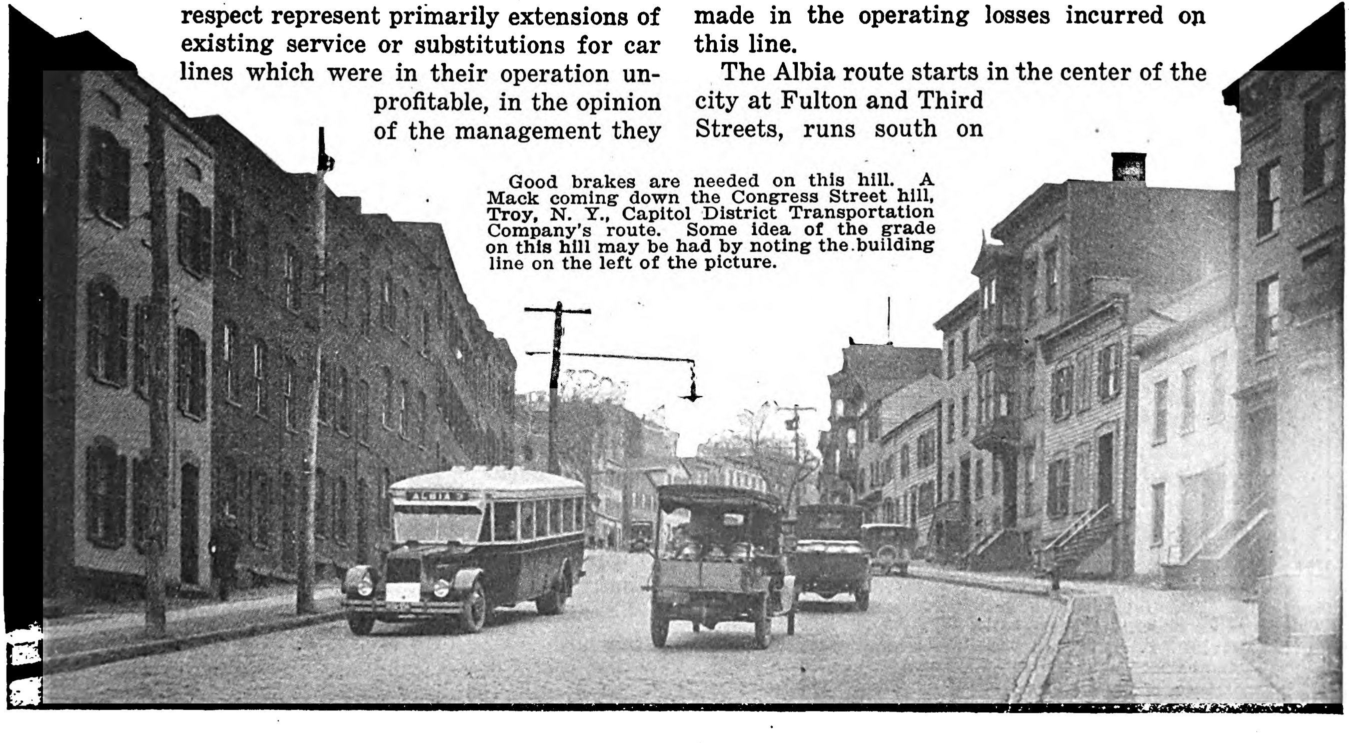
Experience with Successive Types of Buses Prove the Adaptability of the Six-Cylinder Gas-Electric Type for Frequent Stop Service and Heavy Grades

EXPERIENCE of the Capitol District Transportation Company in Albany and Troy, N. Y., has led the management of this bus operating subsidiary of the United Traction Company, Albany, N. Y., to a number of conclusions regarding the basis for successful operation of such vehicles. Ernest Murphy, general manager of the United Traction Company, is a believer in the possibilities of the bus. He insists, however, that the basis for successful operation cannot be found by relegating the bus to thinly settled territory in the outskirts, where it is impossible to show a profit with any form of transportation.

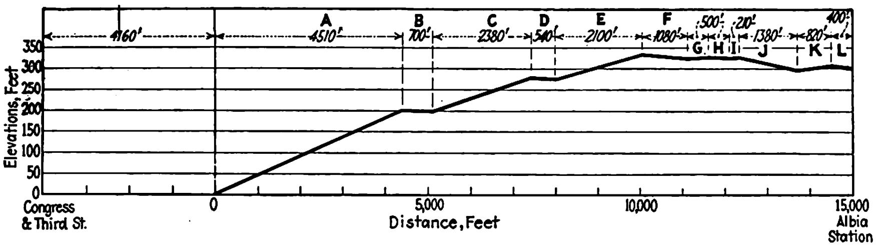
Although the buses in Albany and Troy are operated as street cars on rubber tires, and in that respect represent primarily extensions of existing service or substitutions for car lines which were in their operation unprofitable, in the opinion of the management they have permitted a substantial improvement in service. They have been the means of cutting down the losses incurred in the rail operations which they have replaced and of avoiding heavy and unjustified expenditures for track renewal and street paving.

On the Albia route in Troy 23 Mack six-cylinder, gas-electric buses have replaced the former trolleys and the rails have been removed. In this case the rail service was abandoned primarily because of a prospective heavy paving expenditure. The type of paving used here—cut Vermont granite block—costs between $5 and $8 a foot of track. At the present time the obligation to pave is fixed by state law. As the result of the substitution of buses a consideratble reduction has been made in the operating losses incurred on this line.

The Albia route starts in the center of the city at Fulton and Third Streets, runs south on



Good brakes are needed on this hill. A Mack coming down the Congress Street hill, Troy, N. Y., Capitol District Transportation Company's route. Some idea of the grade on this hill may be had by noting the building line on the left of the picture.



Graphic Diagram of Grade Problem Encountered by Buses on Albia Route of Capitol District Transportation Company, Troy, N. Y.

Section	Ft.	Av. Grade, Per Cent
A	130	5
	150	6.13
	60	5.0
	200	7.75
	425	9.17
	315	7.84
	230	5.87
	220	4.32
	420	3.73
	730	3.38
	370	1.60
	200	2.70
	100	1.43
	400	5.10
	260	3.27
	310	1.43
	4,510	4.5
B	400	1.0
	300	0.4
	700	0.74
C	450	2.38
	750	3.87
	420	6.30
	250	3.60
	510	0.5
	2,380	3.29
D	540	0.5
E	260	1.0
	300	1.37
	270	2.43
	300	4.40
	150	5.40
	320	4.32
	200	2.40
	300	0.6
	2,100	2.7
F	380	0.6
	700	0.87
	1,080	0.77
G	500	0.64
H	500	0.51
I	210	0.65
J	100	0.21
	275	1.20
	365	4.0
	640	2.5
	1,380	2.4
K	520	1.93
	300	0.40
	820	1.4
L	400	1.0
Total....	2.865 mi.	1.96

Third to Congress, east on Congress to Pawling Avenue and from there out Pawling Avenue to the Albia Station, a distance of 3¼ miles. The average grade over the entire route is 1.96 per cent. On Congress Street the maximum grade is 9.17 per cent. A profile of the line is shown in an accompanying illustration.

Bus equipment of the Capitol District Transportation Company consists of three Mack four-cylinder, gas-electric city type buses on the Oakwood Avenue route in Troy, 23 Mack six-cylinder gas-electric buses of special body design on the Troy-Albia route, two of the same type in Albany and two more in Rensselaer. There are nineteen Fageol gas-electric buses operating in Albany.

The company first began its experiments in Cohoes with four Brockway trackless trolleys. These were followed with two mechanical-drive buses operated in Rensselaer, which have since been replaced by gas-electric drive. Nineteen Fageol double-motor, gas-electric buses were then put in service on the Pine Hills and Arbor Hill lines in Albany. Three four-cylinder gas-electric Macks were tried out on the Albia route and were followed shortly by the type recently put in service, the single-motor six-cylinder gas-electric.

One of the Capitol District Transportation Company's Buses Negotiating the 9.17 Per Cent Grade Up Congress Street Hill, Troy, N. Y. Although This Illustration Does Not Indicate Clearly the Pitch of This Grade, Some Idea of It May Be Gained by Looking at the Building Line

This experimental work was dictated by the desire to find a bus suitable to cope with the particularly stiff problem which is met with in the Albany district, that of bad hills. The bus required had to have plenty of power to negotiate the grades. At the same time it was important that the weight and cost of operation be held to a minimum.

Mechanical - drive, four - cylinder buses were found unsuited for the work. Although they negotiated the Troy hills, their operation was slow. On the steepest grade a speed of only 3½ m.p.h. was possible. It was finally determined that mechanical-drive buses could not stand the service demands on the very steep hills encountered in Albany and Troy.

SIX-CYLINDER EQUIPMENT SHOWS IMPROVEMENT

The six-cylinder gas-electric buses are able to maintain an average speed of 7 m.p.h. on the Congress Street hill in Troy. The company feels that it now has a vehicle which provides practical transportation equipment for this service.

Mr. Murphy expresses the company's views on bus equipment as follows:

"We use gas-electric buses because they give us better service than mechanical-drive buses. They are time-savers on hills, as the acceleration is more rapid. Gears are slow enough under normal conditions, but on these hills they are practically impossible. Another reason is that they eliminate the expense of installing new gears and clutches in the buses periodically. The Albia route is up-grade practically all of the way in one direction and patronage demands at least eight stops to the mile or an average of 23 per trip. On our grades clutches won't stand very much of that kind of severe service.

"An operator cannot mix gas-electric and mechanical-drive buses in the same fleet. After driving gas-electrics, a chauffeur will not touch a clutch-driven bus if he can help it, and if he does drive one he often will abuse it.

"Another reason for gas-electrics here," Mr. Murphy declared, "is to relieve drivers of all duties not absolutely essential. Through experience it has been found that on grades such as ours much time is lost in shifting gears. There is also the question of safety. A driver can maintain control of his bus with one hand and both feet while collecting fares and making change. This saves time as well, in that not a moment is lost by collecting fares before starting the bus. I might mention that it takes considerable driving skill to get going in the middle of these grades with a gear-driven bus. A gas-electric takes hold easily and maintains headway without visible effort."

Co-ordinated Study of Rail Corrugation Made in Europe

International Union Committee Believes that Rail Quality and Track Condition Are Important Factors—Influence of Rolling Stock Is Now Being Investigated

By D. D. Ewing

Professor of Electric Railway Engineering, Purdue University, Lafayette, Ind.

REAL progress in the solution of the problem of rail corrugation can be made only by co-ordination of individual efforts and centralized direction of research work, according to a report presented at the recent Barcelona Congress of the International Union of Tramways, Local Railways and Public Transportation Automobiles by a sub-committee of the International Committee on the Standardization of Rails and Track Apparatus. The sub-committee, which consists of three railway operating officials assisted by an associated technical staff, was appointed at the Paris Congress of the International Union in 1924 and since its appointment has been devoting much time and thought to the corrugation problem. While the committee arrived at a number of tentative conclusions, it prefaces its report with the statement that it is not attempting, as yet, to present final conclusions, as such conclusions should be based on exhaustive tests and observations.

The initial work of the committee consisted of a careful historical review of past studies and observations on the subject. Its summary of these studies shows that there exist two principal current opinions on the subject:

1. The phenomenon is due to mechanical causes inherent in the rolling stock, track and methods of operation and maintenance. The undulatory wear is caused by an intermittent sliding of the wheels and a hammering of the rail. The length of the waves, being a function of the frequency of vibration of the materials involved, is proportional to the speed.
2. The rail contains within itself as it comes from the mill the germ of corrugation, and the external mechanical actions only develop still further the incipient waves. The length of the waves does not depend on the speed of the cars but does depend on the variations in hardness in the rail.

The majority of adherents to both opinions consider that track rigidity and dirt on the rails are aggravating causes.

As a second step in its work the committee sent a detailed questionnaire to member companies of the International Union. From the answers to this questionnaire a large amount of useful data were compiled and the analysis of these data resulted in the following conclusions by the committee:

1. Undulatory wear is encountered on light traffic lines as well as heavy traffic lines. However, it develops more rapidly on heavy traffic lines.
2. While no clear relation between type of rolling stock and corrugation has been found, the committee believes that cars whose ratio of wheelbase to total length is low and cars in which the body suspension is fairly rigid or stiff are more likely to cause corrugation than cars with a high ratio between wheelbase and total length and cars with a more elastic spring suspension.
3. Corrugation is found on narrow gage as well as on normal gage track and on elastic track as well as on rigid track. However, the general experience is that paved track is more likely to corrugate than open track. The committee suggests, however, that rather than being a matter of rigidity or elasticity it is a matter of the natural period of vibration of the rails that is involved.
4. Corrugations ordinarily do not develop on track where the car speeds are below 10 or 12 m.p.h except where caused by braking in the immediate vicinity of stops.
5. Corrugations usually occur: (a) On the outside rail in curved track; (b) on both rails in straight track in spots separated by a distance dependent on the amplitude of the nosing motion of the car.
6. In length the corrugations vary from 0.8 in. to 5.1 in. and the length depends on the car speed. It also seems to be a function of the car axle diameter; the weaker the axle the longer the wave.
7. Corrugation seems to be the result of a purely mechanical phenomenon which causes irregular wear by intermittent rubbing and hammering of the surface.
8. Corrugations will develop with either conical or cylindrical wheels.
9. The nature and quality of the rail are of capital importance. The metal should be of such character as will enable it to resist the irregular strains to which it is subjected. The elastic limit and per cent elongation should be as high as possible. Data so far available seem to show that rails whose product of breaking strength and per cent elongation are high are less susceptible to corrugation than others, providing also that the elastic limit is high.
10. Rails of large cross-section are more susceptible to undulatory wear than rails of light cross-section, probably because the metal in the lighter rails is worked better.
11. While surface hardening of the rails by the "in situ" or other process seems to retard corrugation, the available data are insufficient to justify definite conclusions.
12. Micrographic studies have developed nothing new in the way of conclusions as yet.
13. Type of rail joints *per se* does not influence corrugation, however defective joints may aggravate it.
14. Defective track condition is a common aggravating cause of undulatory rail wear.
15. While corrugations may be removed by grinding, experience has shown that sooner or later they usually return and the best preventive remedies seem now to be: (a) Use semi-hard steel of good quality and high elastic limit, and which requires a large value of total work to cause rupture by tension; (b) build the track very carefully and design the substructure to fit the sub-soil conditions; (c) use cars whose ratio of wheelbase to total length is as great as possible and whose suspension is conveniently elastic.

The committee commented at some length on the report presented at the American Electric Railway Association convention last year by the American committee on rail corrugation. In general it agreed with the tentative findings of this committee.

As a third phase of its work the committee has set up a research program. In introducing this program the committee makes the following interesting comment:

"The divergencies which are found among the different theories of undulatory wear are not so great as they might at first be thought. A retrospective examination of the question shows that it is possible to extract from the whole a mean opinion, susceptible of bringing all answers together, and which can be summarized as follows:

"Due to imperfections or to the nature of the track and rolling stock and due to speed certain forces result, which tend to cause the cars to deviate from the trajectory assigned to them by the track. The various reactions which result therefrom affect the rolling contact and make it irregular. Moreover, there are produced vibrations of the rails the character of which depend on the constitution and condition of the track.

"The irregularity of the rolling stock and the rail vibrations submit the metal of the rails to stresses which are of a nature to create undulatory wear. This being true, the undulatory wear is or is not produced according to whether the nature and quality of the metal will or will not allow it to give way under the stresses which are set up."

With this in mind the committee developed its research program to include the following three important elements:

1. An investigation of the qualities which rails must have in order properly to prevent undulatory wear.
2. A study of the influence of track condition on rail corrugation.
3. A study of other causes of corrugation, especially those which are inherent in the rolling stock.

The investigation of rail quality has been proceeding along several lines. Laboratory tests on specimens cut from rails taken up from tracks show that the total work of rupture ranged from 152 kg.-m. (1,100 ft.-lb.) to 175 kg.-m. (1,265 ft.-lb.) for corrugated rails. For undamaged rails the total work of rupture in every case exceeded 201 kg.-m. (1,450 ft.-lb.). The total work of rupture is determined from the area under the force-elongation curve which is plotted from tension test data.

Service tests which consist of placing rails of known physical qualities in locations where severe corrugation occurs in ordinary rails are under way but as yet have not been under observation long enough to yield definite results.

As a result of its work on rail quality, however, the committee submitted the tentative recommendation that rails should be preferably of semi-hard quality with high elastic limit and with a high per cent of elongation.

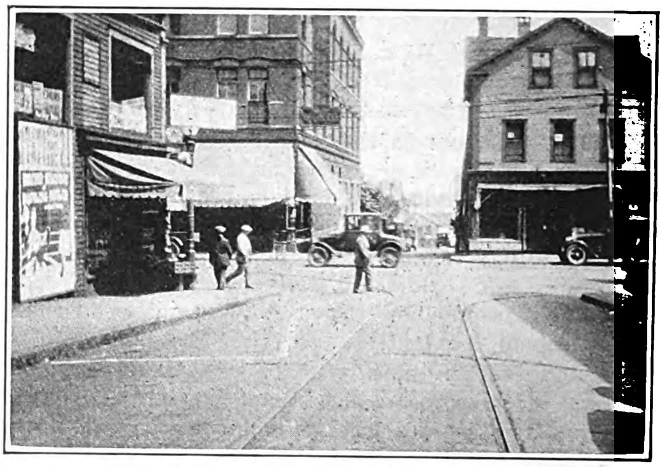
A further specification to insure that the total work of rupture shall be high is that $R + 6A \geqq 175$, where R is the ultimate strength in kilograms per square millimeter and A is the per cent elongation.

The studies so far made on the relation between track condition and rail corrugation have developed the conclusion that it is necessary to attend particularly to the details of track construction and maintenance as slight track imperfections aggravate the undulatory wear on the rails.

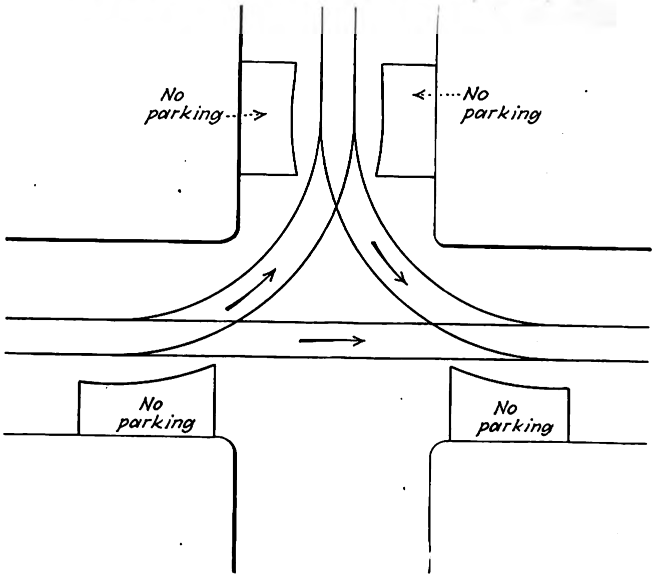
The committee's work on the third phase of its research program is just getting under way and no conclusions were reported.

No-Parking Areas Established Opposite Railway Curves

WHITE curved lines have been painted on the pavement at street intersections in New Bedford, Mass., where the street car overhang or swing is sufficient to overlap part of the street used for parking automobiles. These lines have eliminated parking in places which would interfere with street car movements due to a lack of sufficient clearance. While the Union Street Railway paints the white lines, the police department enforces the no-parking regulations. The municipal governing body has assisted by passing effective regulations. One ordinance reads: "No vehicle shall be allowed to stand within the intersection of any street, nor within 10 ft. of any street corner, crosswalk, fire hydrant, pole, post or place designated as a stopping place for street cars or street railway buses except in cases of emergency or when directed to do so by a police officer in uniform."



No Parking Area Opposite Curve in Railway Tracks



In New Bedford White Lines Are Painted at Street Intersections Where the Car Overhang Is Too Great to Clear Parked Automobiles

Car stopping places in the traffic center of the city have been designated by city ordinances as no-parking areas, varying from 35 to 135 ft. in length. This ordinance has not only made street car entrances accessible to patrons but has materially speeded up traffic movements through the down-town section.

Effect of Abrasion and Compression on Rail Corrugation*

Energy That Is Stored by Elastic Deformation of the Axle Causes De-Torsion and Consequent Abrasion—Compression Causes Structural Changes in the Rail Metal

By *Ch. Fremont*
Paris, France

FOR a long time engineers have been studying rail corrugation and numerous explanations have been given, which partly contradict each other. Hypotheses have been established, but the experimental study of this subject has been somewhat neglected.

In the year 1920 we began to make some experiments in regard to the wear of rails, due to abrasion. It is believed that if slipping follows suddenly the rolling of a wheel on a rail, a tangential shock will be exerted on the tire of the wheel, due to sudden and excessive friction. Such a shock cannot be counteracted by an equal counter shock. It represents an amount of energy which is absorbed by an elastic deformation of the mechanical parts connected to the wheel, and which is generally taken up by the axle in the shape of a torsional twist.

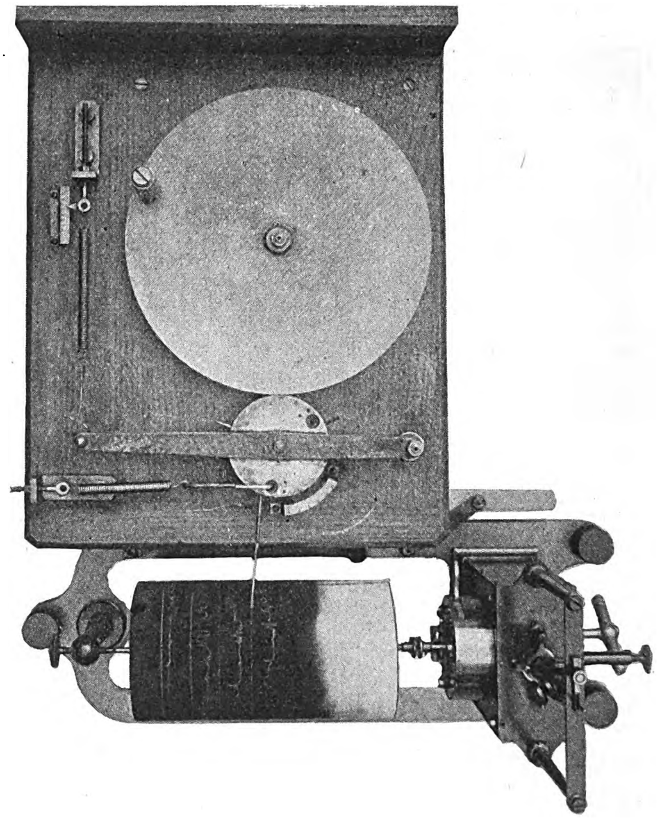
This elastic deformation, which is proportional to the intensity of the shock, stores an amount of energy that, when released, causes the wheel to turn rapidly in the opposite sense, causing a de-torsion of the axle. This will cause a grinding of the tire against the rail, accompanied by local friction. Additional shocks will follow the first one for the same reasons, and these will cause undulatory wear of the rail, due to a number of successive jerks of the wheel.

DEMONSTRATION OF TANGENTIAL SHOCK

In order to demonstrate the tangential shock on the wheel of a car, we have built a mechanism which is shown in an accompanying illustration. In this mechanism the rail moves while the wheel remains stationary. In order to give the rail a continuous motion of sufficient speed, it has been replaced by a large disk with central horizontal axis, and a small handle near the periphery by which it may be turned. Above this disk, and in the same plane, is placed a small disk representing the car wheel. In order to show the effect of changing the weight on the wheel, the small disk has its axle in a lever, at the extreme end of which is fastened a heavy spring the tension of which can be regulated at will.

If the large disk is turned by hand in a clockwise direction the small wheel will try to revolve counterclockwise; but it is prevented from doing this by a spring near the uppermost point of its periphery, which exerts a tangential pull on this wheel.

If the pressure of the small wheel against the large wheel is moderate, and if the speed of driving the large wheel is small, the sliding friction between the two exerts a slight tension on the tangential spring. This spring tension remains constant as long as the speed with which the large disk is revolved does not change. If the force which presses the small wheel against the large wheel is gradually increased and the driving speed rises, the sliding friction will be increased, and the upper wheel will pull strongly on the opposing spring.



Mechanism to Record Tangential Shock Produced by a Wheel

At first it will be found that the pull on the upper spring rises continually and proportionally to the sliding friction. At a certain instant, however, when the pressure on the upper wheel and the speed of rotation is constantly increasing, the sliding friction suddenly becomes erratic and tangential shocks will appear, which subject the upper spring to sudden tensions, and it will be seen that the spring rebounds quickly after each tension.

A stylus fastened to the upper wheel inscribes upon a revolving drum its movements. The oscillations of the upper wheel, produced by the tangential shocks, are the cause of undulatory wear of the rails.

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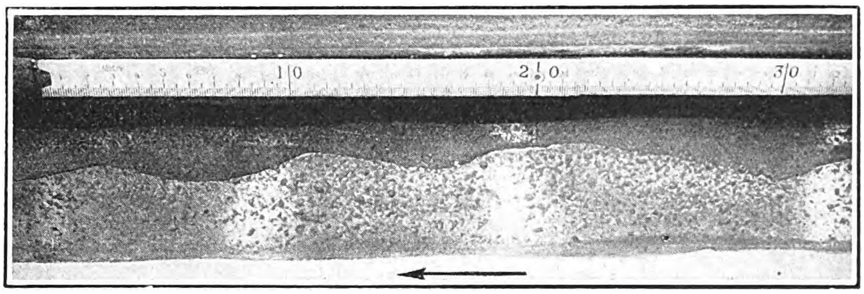
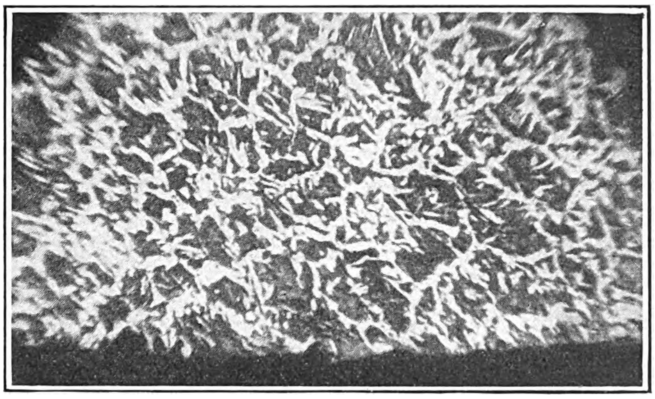
*Abstract of an article published in *le Génie Civil,* Nov. 13, 1926.



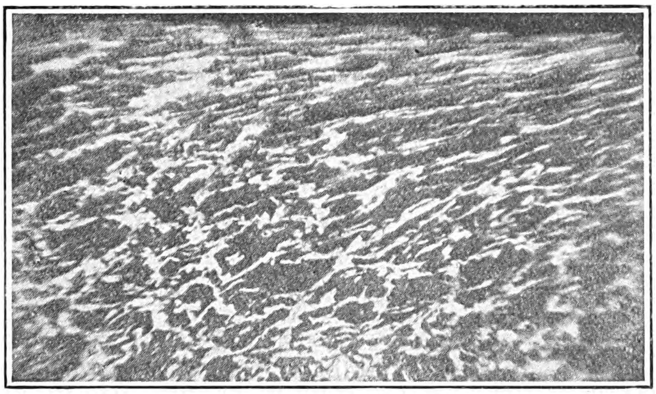
Rail Corrugation Caused by a Conical and a Cylindrical Wheel Tire
The undulations of unequal length are superimposed. The surface is locally deformed, particularly on the side of the groove. Arrow indicates direction of motion of the car.

Abrasion, however, is not the only cause of undulatory wear. In certain cases we have observed on the rolling surface of rails enlarged surface spots of considerable lateral width, which indicate local crushing effects. In an accompanying illustration the rolling surface of a corrugated rail is shown. The individual undulations are not equal in length, and have been produced by both conical and cylindrical wheel tires. The undulations produced by either of these two types of wheel tires are corresponding.

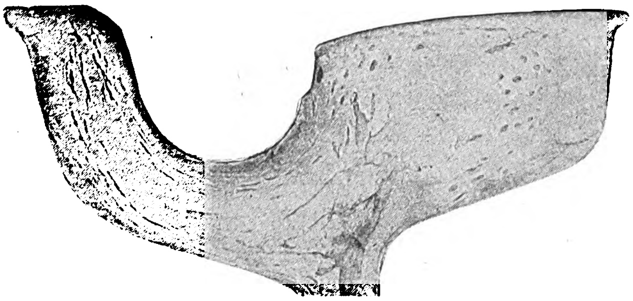
In this illustration the light portions represent the tops, while the darker portions represent the recesses, of the undulations. In the recessed portions, due to the crushing effect, a widening of the metal sideways can be noticed. We have to deal in this case, therefore, not with undulatory wear but with a spreading of the metal due to compression.



Transverse Cut Through the Head of a Rail Passing the Crest of a Corrugation—60 Diameter Enlargement



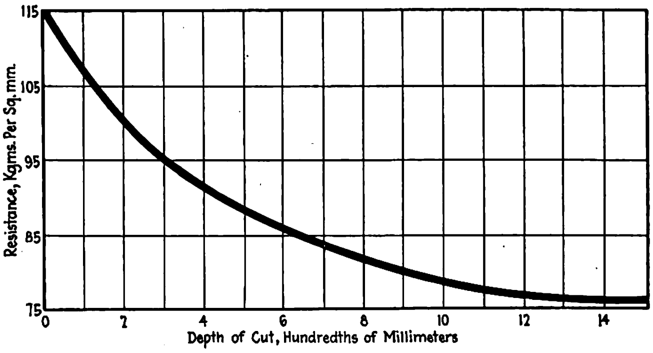
Transverse Cut Through a Rail Head, Passing the Depression—60 Diameter Enlargement



Transverse Cut Through a Rail Head, Showing Distribution of the Displacement and the Side Deformations on the Rolling Surface

A microscopic investigation bears out this assumption. A transverse cut through the top of one of the undulations, enlarged 60 diameters, is shown in an accompanying illustration. In this figure the steel grain is not noticeably deformed at the surface of the rail. Another view shows a transverse cut through the metal of the adjacent hollow. It indicates that the metal therein is greatly crushed near the surface, and it shows a distinct side flow of the metal, which would not be caused by frictional wear. A transverse cut through the head of the investigated rail shows the side flow of the metal near the rolling surface, which is indicated plainly by the very apparent sidewise displacement of the metal.

While it is being deformed at the rolling surface of the rail, the steel is hardened locally. It is therefore important to ascertain the effect of this local hardening upon the resistance of the rail. In order to determine, at least in an approximate way, the degree of this hardness, we have measured the length of the indentation caused by a cutting wheel 60 mm. (2.36 in.) in diameter pressed under a weight of 50 kg. (110 lb.) into the head of the rail. The arrangement for this test is shown in an accompanying illustration. The impression caused by this wheel into the rail head was measured for every 100th mm. (0.0004 in.) depth, beginning at the surface of the rail, and disclosed the relative hardness of a great number of layers of steel near the rolling surface.

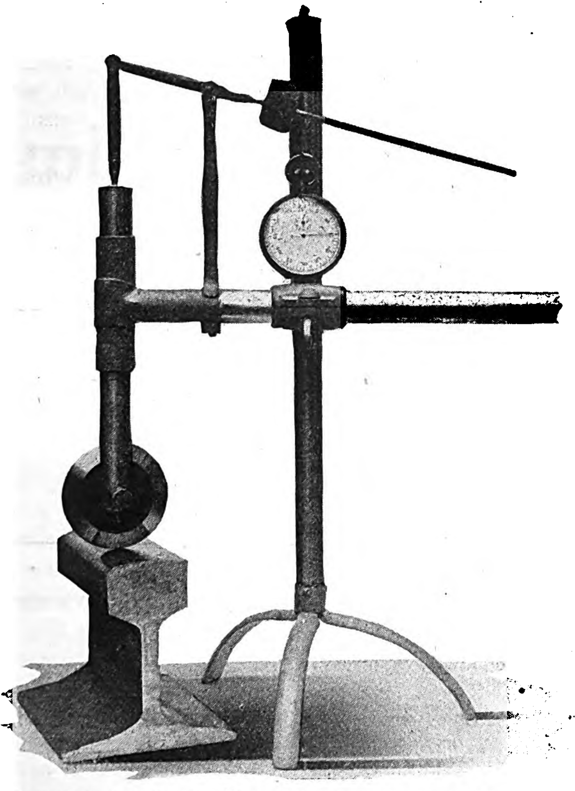


Hardness of the Rolling Surface of the Rail, as Shown by a Weighted Cutting Wheel

The chart is a representation of the results so obtained on a steel rail covering a range of 3 or 4 mm. (0.12 or 0.16 in.) below its rolling surface. The rail itself was made of steel with 75 kg. per square millimeter (105,500 lb. per square inch) rupturing strength. The rail was worn a few millimeters, but its surface was regular and not unusually deformed. In this curve the abscissas indicate the thickness of the hardened steel, while the ordinates indicate the corresponding hardness. The curve shows that the hardened skin has a thickness of just about 0.14 mm. (0.0055 in.), and that, on its very surface, its hardness corresponds to a tensile strength of approximately 115 kg. per square millimeter (162,000 lb. per square inch). On a softer rail with a deformed rolling surface we have found the thickness of the hardened skin to be approximately 0.23 mm. (0.009 in.).

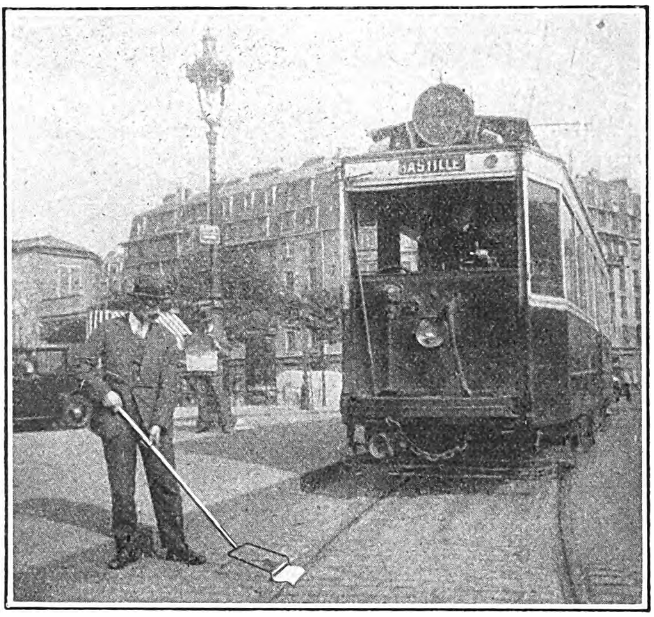
DISTRIBUTION OF PRESSURE IMPORTANT FACTOR

There is one more absolutely necessary detail which must be known for the study of corrugations. That is the distribution of pressure upon the rolling surface of the rail when the wheel of a vehicle passes. We have found good success in determining this local pressure with the following method: a small piece of paper is placed on the rail, and after the car has passed over this paper a certain impression-design will be found thereon. This method of obtaining an impression sample on the surface of the rail while a car passes over it is shown in an accompanying illustration. After having chosen his location, the operator holds a piece of paper on the rail surface with a pair of specially made long-handled tongs and awaits the passage of a car at a certain speed over it. After the first wheel has passed the operator pulls the paper out quickly in order to prevent a second wheel passing over it.



Arrangement for Testing the Strength by Means of a Weighted Cutting Wheel

Other illustrations show reproductions of two pieces of paper so obtained. On these impressions is seen the local distribution of the compression caused by the wheel upon the rail, and to a certain degree the varying intensity of this pressure. The higher the compression per surface unit, the more the paper becomes squeezed, the more transparent it becomes, and the whiter its photographic image.



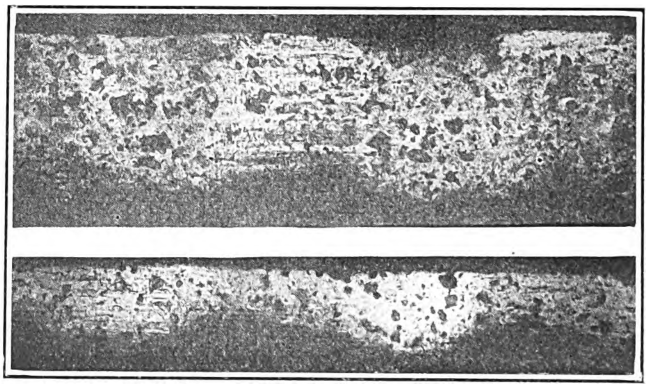
Method of Obtaining Impressions on Paper, Showing the Pressure Effect of a Passing Wheel Upon the Rail

For example, in the upper view we may readily see that in the places where the surface contact was greater, the compression also was greater. Between two maximum spots of crushing, indicated by either intensity or by surface, the impression shows a darker tint, indicating a smaller unit pressure and a reduced contact surface. We find, therefore, that the wheel has pressed upon the rail in an irregular manner, without, however, being itself the cause of the varying compression noted.

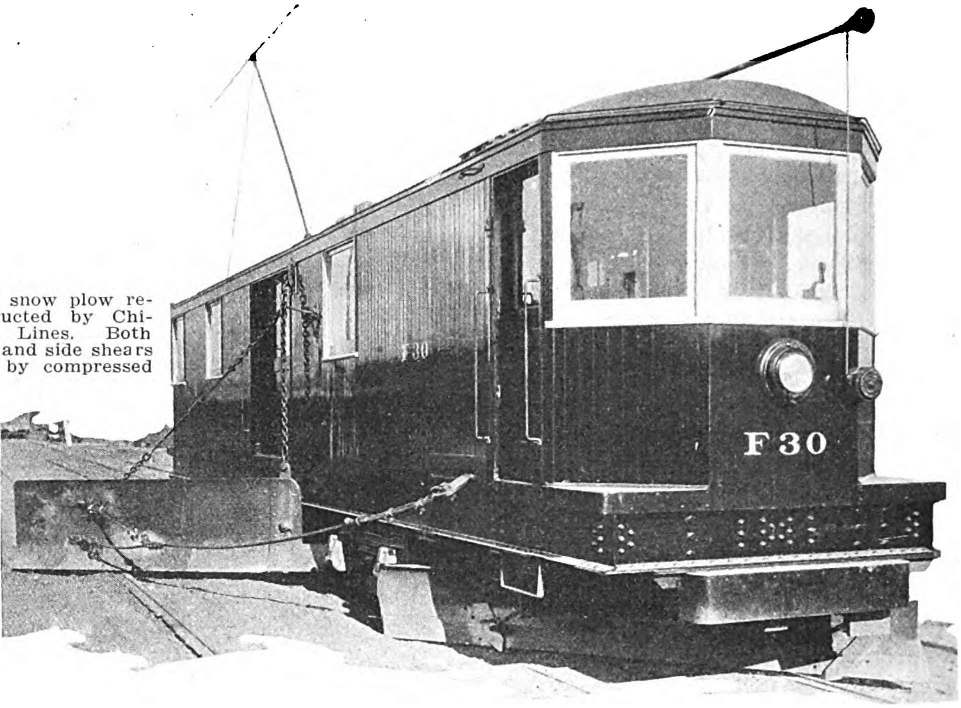
This method of registering the effect of wheels upon rails is of considerable exactness. It reveals also surface faults of the rails, such as small corrosions, striæ from friction caused by the wheels, etc.

All the methods described herein of studying certain phenomena of rail deformations have given us already considerable data, and we expect to make additional new tests which we hope will give us all causes of undulatory wear.

A second part of this investigation, which is to follow, will show the relation which exists between varying compressions of the rail and vibrations of the rail, in conjunction with certain oscillations of the car itself. These future data will be obtained by means of a special car which is equipped with recording apparatus and which will move on special test rails.



Examples of Impressions Upon Paper on Undulated Rails



Exterior of snow plow recently **constructed** by Chicago **Surface** Lines. Both **center shears** and side shears **are operated** by compressed **air.**

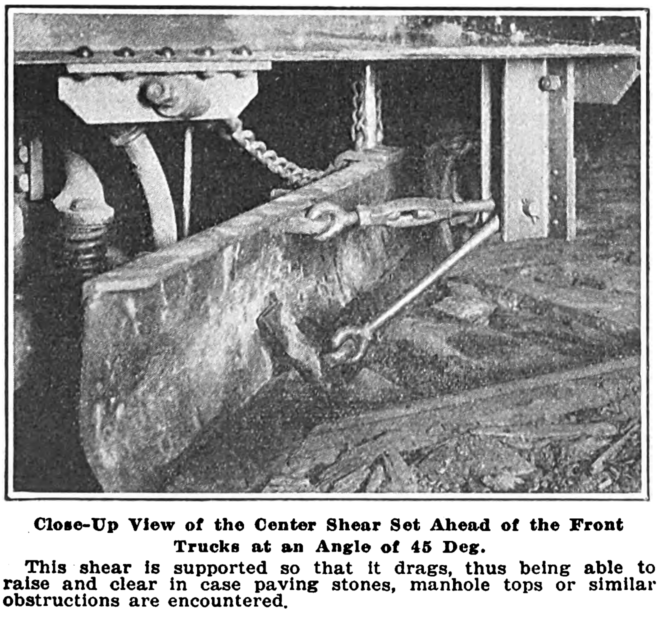
Chicago Builds an Improved Snow Plow

Double-Truck Unit Built in Shops of the Chicago Surface Lines Is Arranged for Double-End Operation and Carries a Central Shear at 45 Deg. Under Each End—Two Wings Clear Side Area—All Four Shears Are Operated by Compressed Air

By W. C. Wheeler

Engineer of Equipment Chicago Surface Lines, Chicago, Ill.

ON JAN. 14 of this year the new snow plow completed last fall in the West Side shops of the Chicago Surface Lines had its first real test. Snow fell during the day, finally reaching a depth of 9 in. This new unit operated continuously, clearing many miles of track. At the same time it avoided delays by maintaining its place in the schedule. The air-operated wings and shears were easily adjusted and shifted to avoid street and traffic obstructions.



Close-Up View of the Center Shear Set Ahead of the Front Trucks at an Angle of 45 Deg.

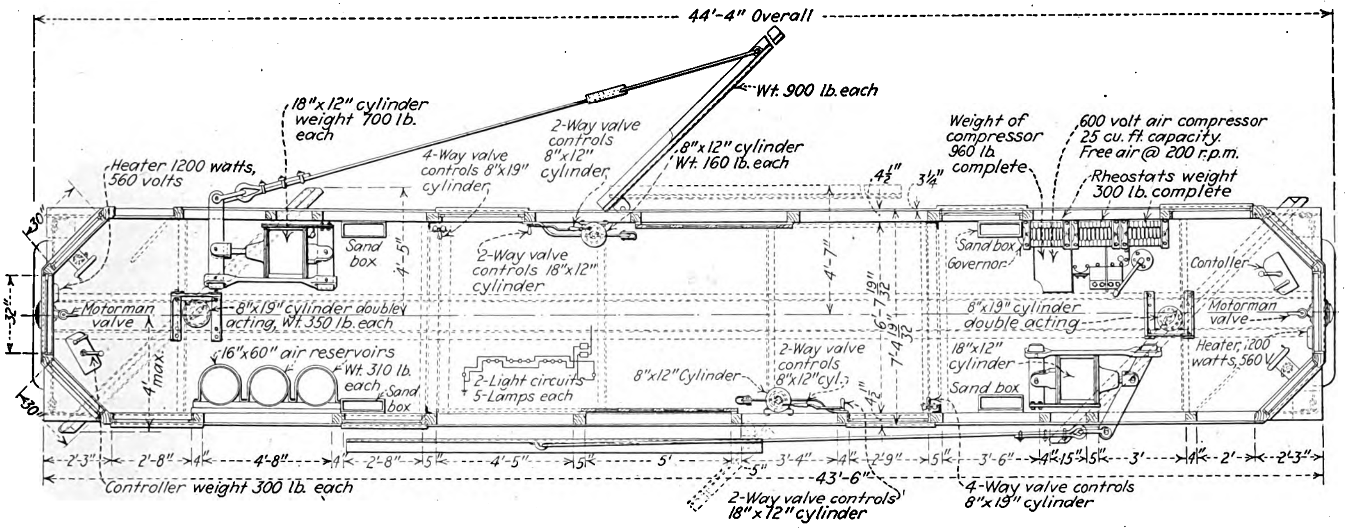
This shear is supported so that it drags, thus being able to raise and clear in case paving stones, manhole tops or similar obstructions are encountered.

Experience gained in Chicago during a heavy snow storm during the latter part of March, 1926, showed the difficulty of handling snow by means of sweepers. Snow that fell during that day was packed by auto trucks faster than the sweepers could remove it, and before the heavy wings could be put in service the limitations of the equipment used in keeping the track open were obvious. As a result of this experience the new plow was designed and constructed by the Surface Lines under the direction of H. H. Adams, superintendent of shops and equipment, during the summer and fall months of last year.

The plow is arranged for double-end operation and, as shown in the accompanying illustrations, carries four shears, two for clearing the track surface and two for clearing the street area. Only one pair of these shears is operated at a time.

Two men operate the plow; one, a motorman, devotes his attention to running the car, and the second controls the shears by means of compressed air, his position being by the side window in view of the wing.

This plow has been so satisfactory that it is believed possible to clear away a snowfall much faster and with better results than with a sweeper. The combination of air-raising and lowering of the front shear, the ability to provide pressure by means of the double-acting air cylinder to hold down the front shear and the air operation of the side wings are points of marked superiority in the design. The front shear is also pulled rather than pushed, so that it automatically lifts in case it strikes a paving brick or other rigid obstruction.

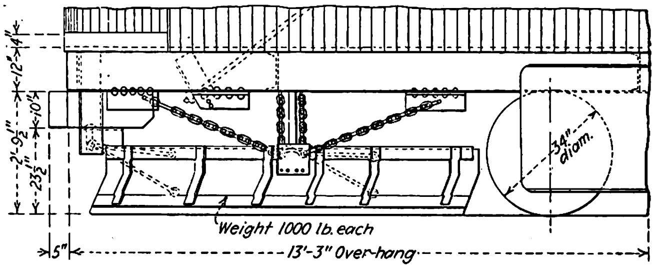

44'-4" Overall
18"x12" cylinder weight 700 lb. each
Wt. 900 lb. each
2-Way valve controls 8"x12" cylinder
4-Way valve controls 8"x19" cylinder
8"x12" cylinder Wt. 160 lb. each
Heater 1200 watts, 560 volts
Weight of compressor 960 lb. complete
600 volt air compressor 25 cu. ft. capacity. Free air @ 200 r.p.m.
Rheostats weight 300 lb. complete
4½"
3¼"
Sand box
4'-5"
2-Way valve controls 18"x12" cylinder
4'-7"
Sand box
Governor
Contoller
Motorman valve
8"x19" cylinder double acting, Wt. 350 lb. each
6'-7 19/32"
7'-4 19/32"
8"x19" cylinder double acting
Motorman valve
16"x60" air reservoirs
Wt. 310 lb. each
Sand box
4' max.
2-Light circuits 5-Lamps each
8"x12" Cylinder
2-Way valve controls 8"x12" cyl.
4½"
18"x12" cylinder
Sand box
Heater, 1200 watts, 560 V.
30"
32"
30"
2'-3"
2'-8"
4"
4'-8"
4"
2'-8"
5"
4'-5"
5"
5'
5"
3'-4"
4"
2'-9"
5"
3'-6"
4"
15"
5"
3'
4"
2'
2'-3"
43'-6"
Controller weight 300 lb. each
2-Way valve controls 18"x12" cylinder
4-Way valve controls 8"x19" cylinder

Floor Plan, Showing the Dimensions and Arrangement of Equipment in the New Snow Plow Recently Placed in Service by the Chicago Surface Lines

This is a double-truck, double-end, steel-framed car that is capable of performing the work of snow removal on Chicago city streets and maintain its place in the operating schedule.

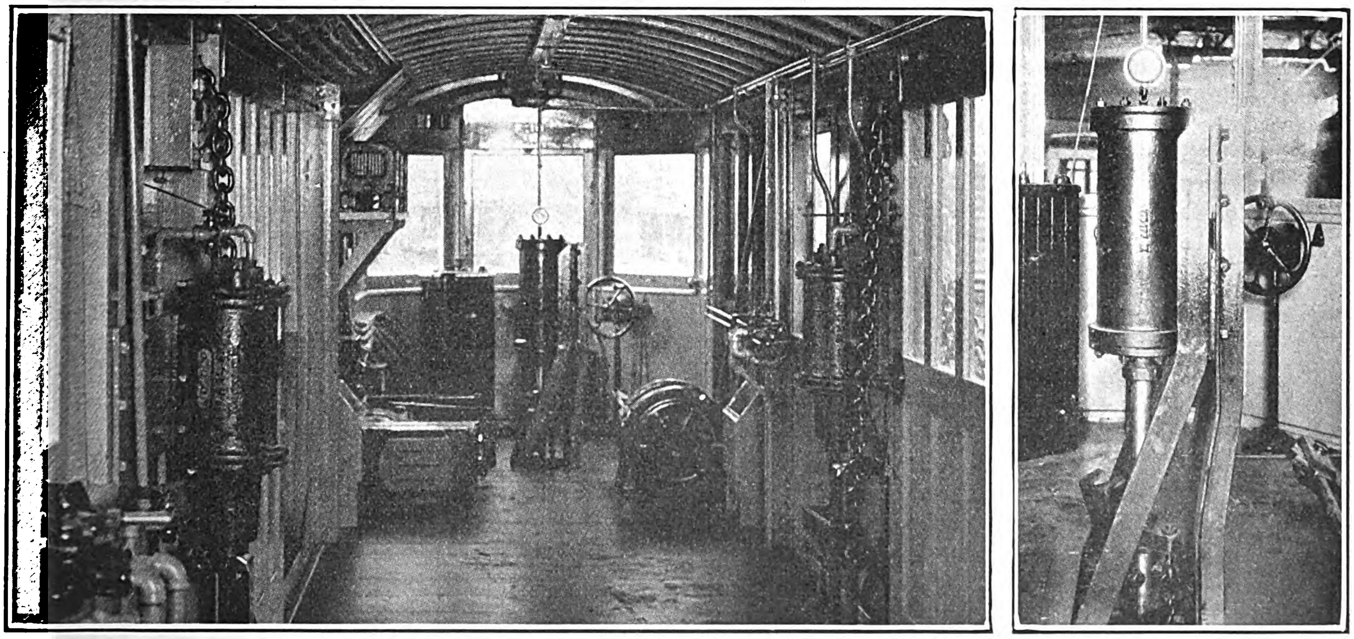
Until recent years the snow-fighting equipment has been divided into two general classes, sweepers and plows. Often the sweepers were able to handle all the snow. Due to heavy automobile traffic, especially in congested centers, the snow often becomes packed into the flangeways so that plows have become increasingly valuable. Sweepers are often unable to remove this hard-packed ice and snow. Many plows constructed in the past were not flexible enough to permit rapid operation in congestion. If they were heavy enough to do the work, they were cumbersome and it was difficult to manipulate the wings and shears.

The bare steel frame constituting the structure of the plow weighs 10,000 lb. The various pieces of equipment used increase its weight to 62,150 lb. without the use of dead weight. The general floor plan and side elevation detail are shown in accompanying drawings. Most of the equipment used was taken from spare stock and was arranged in the car body in such a manner as to leave a roomy interior. This is indicated in the interior view.


4"
12"
10½"
2'-9½"
23½"
34" diam.
Weight 1000 lb. each
5"
13'-3" Over-hang

Partial Side View Showing Method of Support of Front Shear on New Snow Plow Built by Chicago Surface Lines

Each center shear has a dead weight of 1,000 lb. and is supported at an angle of 45 deg. One is located in front of each truck. These shears are arranged to drag, since the points of support are ahead of the shear edge. For this reason the shear will free itself if it meets a solid obstruction. Each shear can be raised by means of the air cylinder mounted behind the motorman's



Interior of Snow Plow Showing the Air-Operated Cylinders for the Side Shears Hung on the Side Wall

At left—In the center of the car just behind the motorman's position is a vertical double-acting air cylinder used for raising the center shears or for applying additional downward pressure. To the right is the cylinder used for holding the side wings in place, or releasing them, so that they may swing against the sides of the body. The plow is operated by two men, one a motorman, who concentrates his entire attention on driving the car; the other, standing at the side window, operates all of the cylinders that are controlled by means of air.

At right—Close-up view of the double-acting air cylinder controlling the center shear. The mechanical device shown at the bottom of the cylinder locks the shear in the upper position.

position in the center of the car, as can be seen in two of the views reproduced. The shears are made of ½-in. steel plate, 18 in. wide by 12 ft. 3 in. long, reinforced with a single angle at the top, and a double angle at the bottom. Six angles placed vertically on the back of the shear stiffen the blade. The edge of each shear is reinforced by a 1-in. x 6-in. steel wear plate fastened to the lower edge, which in turn is supplemented with two tool-steel bits set so as to follow the rail and clear the flangeway.

The cylinder that operates each center shear has an 8-in. diameter, with a 19-in. stroke, and is double-acting. It will either raise the shear and hold it above the street surface, where it may be locked mechanically, or with the air above the piston the downward pressure on the shear can be increased by 4,275 lb. In case of striking an obstruction the shear will always be readily raised against the air cushion of the piston. This extra downward force is useful in cutting hard-packed snow and ice.

SIDE WINGS OPERATED BY COMPRESSED AIR

Originally the plow was equipped with 10-ft. side wings weighing approximately 675 lb. each. Due to the experience gained in the first trial of this plow, these were replaced with 14-ft. wings weighing some 900 lb. In this way a sufficiently wide roadway is cleared along the side of the track for vehicular traffic. The plow had ample power and weight to operate the longer wing successfully.

Each side wing is fastened by a 2-in. bolt to a 1-in. plate bent in the shape of a U and arranged to slide up and down on a 2½-in. pin supported at the pivot fastening. This U plate allows the wing to swing out from the side of the plow in an arc with the pivot as a center. The bolt allows the wing to swing in a vertical plane around it as a center. The combination makes a very flexible joint, and the wing cannot stall as it will lift at the outer end and clear itself when pulling in very deep or hard snow.

This side wing is made of ⅜-in. plate 36 in. wide and 14 ft. long. It is curved at the bottom on a 12-in. radius and reinforced with 4-in. x 3-in. x ⅜-in. L-shaped steel members the entire length. The plow is pulled by a 1-in. steel cable attached to two points of the shear. A chain connection made at two other points, as shown in one of the illustrations, is used for raising or lowering the wings by the vertical 8x12-in. brake cylinders inside of the body.

Provision is also made for locking the wings in the raised position when the snow plow is moved about not in active service.

New Bus and Truck Repair Shop for the Los Angeles Railway

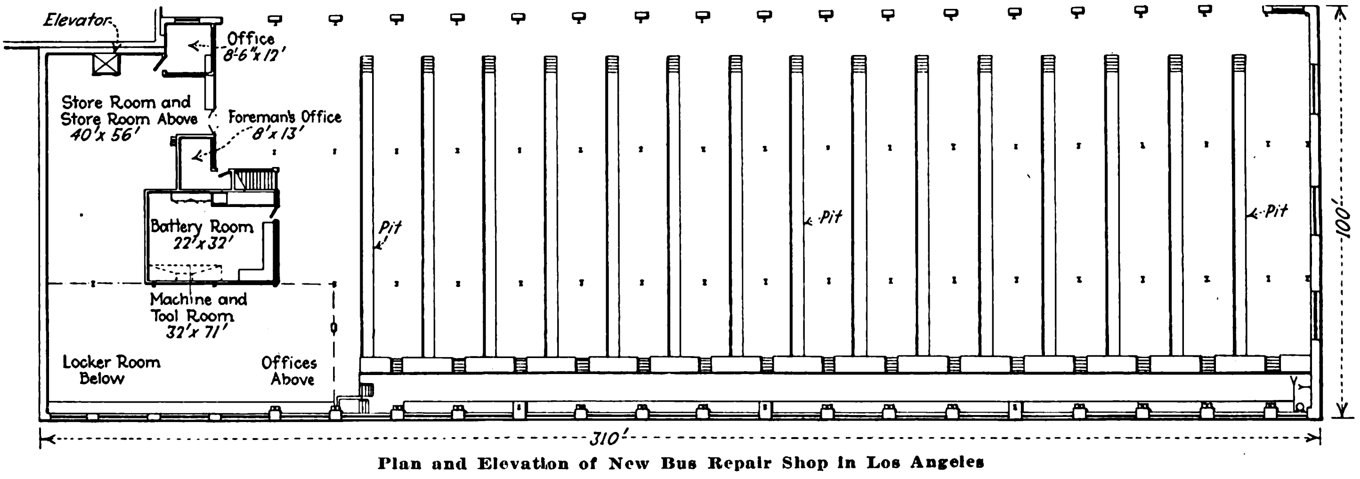
GENERAL bus, truck and automobile inspection and repair work are provided for by the Los Angeles Railway in the recent award of a contract to the Willard Brent Company for the erection of a modern brick, reinforced concrete and steel structure. The building will be erected along the Fifteenth Street frontage of the property of the railway company known as the Sixteenth Street yard. It will be 310 ft. long and 100 ft. wide and will provide pit accommodations for 30 buses. It will also contain store room, machine shop, battery room and offices for the superintendent of automotive equipment. There will be three floor levels, a depressed area, ground or main floor level and the mezzanine floor at the east end of the building.

The stores department will have quarters both on the ground and the mezzanine floors. The two floors are connected by a hydraulic elevator. The machine shop and battery room are to be located immediately below the mezzanine floor. The machine shop will be equipped with lathes, milling machines, cylinder grinders, etc., although no heavy or production work will be done here, as that is all done at the company's main shops. Plans call for three traveling cranes the length of the shop.

The buses can be driven in from the Sixteenth Street yard directly from the ground level over the pits. Along the northerly side the floor is on the same level as the bottom of the pits. The main benches are to be located along the northerly wall, where the greater part of the bench work will be done. On the southerly side of this depressed area there are benches which will accommodate men working in the pits. This permits the men to walk directly in and out of the pits without climbing in and out, as is the usual custom.

All lights in the pits are to be recessed, and convenient recesses will also be provided in the pits for the mechanics' tools. On the main or ground level floor work benches are to be constructed directly over the benches used by the men at work in the pits. The upper tier of benches are for the accommodation of mechanics working on the ground level.

The basement located at the east end of the building will be devoted to locker rooms and toilets. The locker rooms will be equipped with full-length steel lockers, spray wash basins and showers. All plans for the structure were drawn by the engineering department of the railway. The contract price does not include the lighting system, which will be under the control of the engineering department.



Plan and Elevation of New Bus Repair Shop in Los Angeles

The Readers' Forum

Cleanliness a First Requisite

HUDSON & MANHATTAN RAILROAD
NEW YORK, N. Y., Jan. 19, 1927.

To the Editor:

Stimulated interest in the important subject of improving car appearance is desirable. Personally, I believe cleanliness is the first requisite, and if the proper spirit is instilled into an organization to desire that all cars, equipment, stations and shops be clean and be kept in a tidy condition, many troubles will be overcome and the public will feel that it is being served properly. Next to cleanliness I believe that a pleasing lighting of cars should receive consideration.

R. R. POTTER,
Superintendent of Car Equipment.

Old Cars Should Be Replaced as Fast as Possible

DEPARTMENT OF STREET RAILWAYS
DETROIT, MICH., Jan. 20, 1927.

To the Editor:

There seems to be a general realization that the appearance of street cars should be improved and made more comfortable and inviting to the traveling public. This is merely the following out of general principles. An evil of any description will usually run its course, then eventually be corrected. The longer the duration and the greater the evil, the more drastic will be its correction. This particular evil has run for many years and has been particularly bad. Therefore it is not surprising that considerable excitement is being manifested in some instances at this time.

The big majority of cars have been dirty, unpainted and noisy. Little attention has been given to passenger comfort; therefore the traveling public shows good judgment in turning to an automative conveyance that is comfortable, quiet and clean. The logical thing, then, is to build a quiet car, put in good seats, and keep it well-painted and clean. Car riders are not hard to please; if they were, they would have raised a riot along these lines years ago. My observations indicate that all they demand is good horse sense.

Streamline bodies and like things are all right to incorporate when the car is being built, if not carried too far. To be consistent and enduring, from the standpoint of appearance, it must look like what it really is—a trolley car. Neither is it necessary to paint it all the colors of the rainbow in fantastic design. Dolling up old equipment must be done with sound judgment, otherwise considerable money will be wasted on cars that don't warrant the expense, and taking an old car in and giving it a coat of many colors, and this and that, will help little.

Probably on many properties some of the best, most modern cars may be improved by reducing noise, adding more comfortable seats and repainting economically with the regular color design. If they are kept clean 365 days a year they will prove satisfactory. The very old cars should be replaced as fast as possible with new, quiet, comfortable cars, but not necessarily an extravagantly dolled-up affair.

A. C. COLBY,
Superintendent of Equipment.

Speedy and Attractive Cars Needed

ERIE RAILWAYS
ERIE, PA., Jan. 22, 1927.

To the Editor:

From the tone of many articles that have appeared, one might infer that the railway industry was looking forward to a day when some genius would think of a plan to create a desire on the part of the public for more car rides per capita. It seems to the writer that no great wizardry is required, at least to those who have been in the business for the past twenty years, to know that the people have grown accustomed to doing all things more rapidly than they did ten years ago, and in the matter of transportation over comparatively short distances the matter of expedition is outstanding in their minds, even though they may have nothing to do after they have reached their destination. This appeals to the writer to be the first requisite in serving the people in competition with their own private transportation system.

Secondly, the character of vehicle plays a most important part in the psychology of making their trip as agreeable to them as possible. Although the auto has brought changes in the habits of the riding public, human nature remains the same and there is still the feeling that one does not desire to be associated with anything that appears to be unsuccessful. Therefore, it is not to be wondered at that during those trying days which are passing, the public generally became imbued with the idea that street railways were about to break down, for in many instances, in order to overcome burdensome franchise and fare conditions, that kind of a picture had to be painted. We now have the reaction which we unfortunately brought upon ourselves.

The very fact that the railways have passed through the most trying period of their existence and are proving their necessity should give us the greatest courage in attacking the problems in the future. The public is learning fast of this necessity, and in order to accelerate their inclination to resume patronage the operators of every road that expects to profit by this attitude must show to them that they are alive to the situation. There is no clearer way of doing this than by providing vehicles that will not only make the best scheduled time but that will be most attractive. In this, we do not mean that all present cars must be replaced, but they must be modern in their appointments and kept in a clean and attractive condition.

On all sides evidence is found of properties that have not always enjoyed the best of relations with their patrons, that have since made an attempt to give the community service and equipment commensurate with the requirements of the city in which they operate and that have made themselves a strong factor in the community life and are profiting thereby.

While our property has no aged or recently purchased equipment, we have attempted to keep our cars equipped with modern devices, have several times changed painting schedules, so that we now have a color scheme that is outstanding. Every effort is made to keep the cars attractive, and we believe it has had a material effect in making for good relations with the community. We also feel that the money expended in this manner is more productive of return than any other investment we can make.

A. R. MYERS,
President.

Wide Range of Thinking on Service at Cost

EDITOR'S NOTE

During the recent meeting of some seven economic societies in St. Louis a reporter of one of the local newspapers wrote an article purporting to be comments on the service-at-cost franchise now being negotiated between the city and reorganizers of the United Railways of St. Louis, which is now in receivership. Unfortunately not all of the comments were used. Only those statements were included in the article that opposed the plan now well under way.

Two of the men interviewed were James C. Bonbright and Robert Hale of Columbia University and the third John Bauer of New York, identified with New York transit affairs under former Mayor Hylan.

As reported, the St. Louis interviews were in error on important details, as explained in the communication from Professor Bonbright, and by the others in interviews by a JOURNAL editor. The discussion was one of theory and not of specific fact as applied to the particular situation.

The St. Louis newspaper article was opposed to certain principles of public utility regulation as defined by practice developed during the last ten to fifteen years guided by frequent court decisions. Considerable comment has been provoked relative to the article. Two communications that represent the wide range of thought possible on this subject are herewith reproduced. One is a letter from L. R. Nash, vice-president of Stone & Webster, an economist of great experience, and the other is from James C. Bonbright of Columbia University in clarification and amplication of his reported views on service at cost.

COLUMBIA UNIVERSITY
SCHOOL OF BUSINESS

NEW YORK, Jan. 20, 1927.

To the Editor:

My attention has just been called to a recent article in the St. Louis *Post-Dispatch* which purports to quote a statement of mine as to the proposed "Service-at-Cost" plan for the St. Louis street railway system. In this article I am quoted as saying that the valuation of $58,000,000 agreed upon between the city and the company, as the rate base on which to inaugurate the plan, is an excessively high valuation. I wish to state that this article misquotes the statement which I made to the reporter of the paper. In view of the fact that I am not familiar with the basis on which the valuation of $58,000,000 was reached I am not in a position to know whether this figure is too high or too low. What I did say, and what I am ready to repeat, is, that in my opinion any valuation of street railways on the basis of present reproduction cost is excessive. Whether or not the $58,000,000 in question represents such a valuation is a matter on which I have not been informed.

I think it wise to add that the whole problem of valuation as applied to street railway enterprises that have previously been under a franchise agreement to charge a 5-cent fare is different from the situation which applies to an electrical company or to any other utility that has not been under a franchise obligation to make a limited rate of charge. Most of the street railway companies of this country accepted as a condition of their franchise an agreement that they would serve the public at a rate of 5 cents per passenger. This was a contractual agreement which promised to turn out very favorably for the investors, and there is nothing to indicate that the courts would have set it aside in favor of the public even if the 5-cent fare had yielded an excessive rate of return.

It so happens, however, that the 5-cent charge is grossly inadequate to yield a reasonable return on the invested capital, but it does not follow that street railway investors have a just claim to relief from this onerous contract any more than it follows that a speculator on the Stock Exchange has reason to complain if his agreement with another speculator involves him in a financial loss. According to accepted business principles the only claim that investors can fairly make as a matter of justice rather than expediency is that any revision of their franchise should preserve whatever earning power might have been realized under a 5-cent fare. It is true that reasons of expediency may justify the public in relieving street railway investors of some of the evil consequences of their original franchise agreements, but this expediency is dictated by considerations of good public service and not by considerations of fair treatment to utility investors. I am inclined. therefore, to be highly suspicious of any valuation of the St. Louis street railway system which reaches the figure of $58,000,000, as I do not believe that any such property values could be realized under a 5-cent fare, but in fairness to the company I should add that this opinion is tentative rather than final and that I did not express, and am not ready now to express, any positive conclusions on a matter to which I have been able to give very little attention.

JAMES C. BONBRIGHT.

BOSTON, MASS., Feb. 4, 1927.

To the Editor:

During the recent annual convention in St. Louis of national organizations of economists certain views were expressed regarding the future of service-at-cost operation of electric railways which invite further consideration. Among these views was one holding that to insure satisfactory service and fares the valuation embodied in a service-at-cost railway franchise must be low. Cleveland was cited as an illustration of long operation of this character under a valuation about 25 per cent less than the claimed fair value of the property, so fixed because the city "had the company at its mercy." It is claimed that similar operations in other cities under more liberal valuation standards have been less satisfactory.

Cleveland fares have unquestionably been low, but well-known favorable operating conditions and efficient administration have been important factors in the result, and at times the ability of the Cleveland company freely to make extensions of its facilities and service has been hampered by its lack of credit due to low capital value and correspondingly low authorized return thereon.

Simple computations will show that under normal conditions the difference between a fair valuation and a niggardly valuation will affect the rate of fare by a minor fraction of 1 cent. General experience with public utility properties in this country indicates that prosperous companies, not unduly restricted in their operations, have given the most satisfactory service and maintained the most friendly relations with their customers. The reason for this is the well-recognized fact that most people in this country are seeking commodities and services on a basis of quality and are willing to pay without question a reasonable price therefor.

Even the humble working man, for whom certain citizens have perennially expressed a profound sympathy, is more and more resenting the thought that he cannot afford quality. Illustrations, of which the number is countless, are not necessary to corroborate this statement. There is no reason to think that the average citizen, uninfluenced by political or newspaper agitation, will consider his payments for public utility service in any different light from those for other services or commodities. The view of the economists who are contending for cheap utility service is, therefore, not sustained.

Furthermore, service-at-cost operation is not in any essential respects different from regulation by the state commissions which is now in effect in more than three-fourths of our states. Service-at-cost agreements merely define in advance the pertinent factors upon which rates are based instead of having them fixed intermittently in rate cases, with the result that there is an automatic and prompt adjustment of rates to cost rather than a spasmodic and delayed adjustment. If, therefore, the contention of the economists is correct, that service at cost is successful only when a low valuation is involved, it must follow that regulation can be successful only on a similar basis. As has already been stated, such a contention cannot successfully be sustained in the light of extended experience.

The value assigned to electric railway property must in the long run be consistent with that placed on other property in order that credit may be maintained and new capital, necessary for expansion in keeping with community growth, secured in competition with similar needs in other industries.

There was also expression of opinion at the St. Louis convention that further service-at-cost agreements, such as are now under consideration in St. Louis, should be made, if at all, with extreme deliberation. It was contended that urban transportation is in a critical period, with the possibility that within a few years surface cars will be replaced largely by overhead or sub-surface rapid transit lines with bus feeders, and that any service-at-cost agreement which provides for amortization of investment in street-car facilities should be avoided because of the heavy burdens which might thereby be imposed on the riding public through rates of fare.

This is a rather surprising doctrine to emanate from an economist, implying that the public should be willing to pay a certain price for transportation but should not assume the burdens of any unusual costs logically incident to changes in methods or character of service which community or economic developments may require. Apparently it is expected that the investors in transportation facilities should have a limited moderate return on the investment (6 per cent being proposed in St. Louis), out of which they would provide for all unusual risks of the business. Why investors should assume such risks when they can obtain a return of 6 per cent or more from investments in bonds and other obligations which involve no such risks has not been made clear.

Under service at cost, as ordinarily defined, a community elects to be served by certain transportation facilities existing when the agreement was made, and stipulates that new facilities, whatever their character, shall be acquired only after full investigation and approval. Unless the community under these circumstances is willing to assume the responsibilities for such unusual amortization as changes in transportation methods may from time to time require, what it is really seeking is not service at cost but service at less than cost. Few communities and probably fewer real economists will admit that such basis of a franchise is equitable. We are living in a period of exceptional industrial and technical development. Old equipment and methods are being discarded for others in keeping with the demands of our unprecedented prosperity. When we buy current models of automobiles we do not demand of the manufacturers a guarantee that they will continue in fashion until worn out. Similarly, in all ordinary developments the ultimate consumer expects to bear the burdens as well as share the advantages of economic progress. There is no sound reason why the public utility field should be an exception to this rule.

Electric railway officials will not agree with the thought that the days of the street-car business are numbered or that the delays to street-car service caused by traffic congestion should be permitted to decrease to the point of extinction the usefulness of a form of service for which no suitable substitute has been found. Traffic congestion in our large cities is caused largely by automobiles, which make up about 80 per cent of the street traffic and carry an average of less than two persons (including the driver), whereas street cars, ordinarily constituting less than 10 per cent of the street vehicles, each carry more than fifteen times as many passengers. It is not clear why a minor group of vehicles performing a major and essential public service should be cast aside to make way for other vehicles performing a minor and, to a large extent, wholly unnecessary service.

The consensus of opinion of careful students of the problems of urban transportation, many of them having no connection with the electric railway industry, is that street cars offer an economical and essential form of transportation upon which the larger cities depend and will depend in the future until a size is reached where rapid transit lines, with their much greater investment, can be supported. It is not clear that even then surface cars will not be the most economical feeders. No city of more than 50,000 population has yet been able to find a satisfactory substitute for rail transportation, although a number have tried to do so.

It is, therefore, apparent that the danger or injustice in accepting this form of transportation as a factor, and ordinarily a major factor, in a new service-at-cost franchise is remote. Such a franchise may well provide for any form of bulk transportation that may from time to time be economical or expedient, and no community can fairly divest itself of the risks or costs which the future may develop incident to change in type or character of transportation consistent with the growth and progress of the community itself. L. R. NASH.

Underwriters' Label Placed on Many New Cars

DURING 1926 the Underwriters' Laboratories inspected and approved 446 new cars and one that was rebuilt. Following the approval the Underwriters' label was placed on the car, thus entitling it to a lower insurance rate.

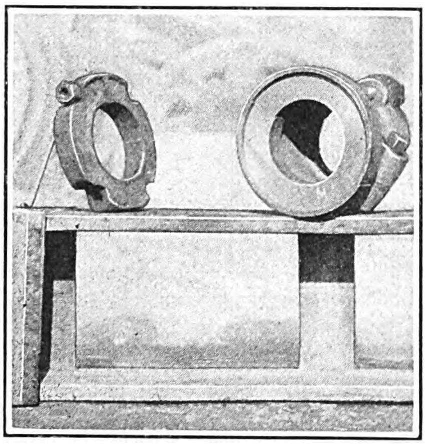
Because of several changes made in the Underwriters' standards and the development of new material for electrical insulation on street cars, it is now possible to obtain cars constructed fully within the requirements of the Underwriters' Laboratories standards with little or no additional cost. There is a nominal charge for the inspection and label of $5 per car.

At least in the eighteen states under the jurisdiction of the Chicago Actuarial Bureau the charge for defective cars is being prorated in the rolling stock fire insurance rate. As the number of inspected cars increases this rate will be reduced.

Maintenance Notes

Adjustable Collar Increases Axle Bearing Life

SHIFTING of motors along the axle has been eliminated, and excessive axle-bearing flange wear caused by dirt and brakeshoe dust has been decreased by the design and adoption of an adjustable, cast-iron axle collar by the Danville Traction & Power Company, Danville, Va. This collar was cast locally in accordance with the company's specifications and all machine work was performed in the shop.



Old Collar on Left and New Adjustable Dust-Deflecting Collar on Right

The axle collar is cast in two pieces and bored accurately to obtain a tight axle fit. Lugs drilled for ¾-in. bolts provide a means for solidly clamping the collar to the axle. Similar drilled lugs cast at one end of each section of the collar provide for the installation of ¾-in. machine bolts to be used for maintaining the proper relationship between the wheel hub and the axle-bearing flange. These bolts are provided with locknuts to lock the adjusting bolt in any desired position.

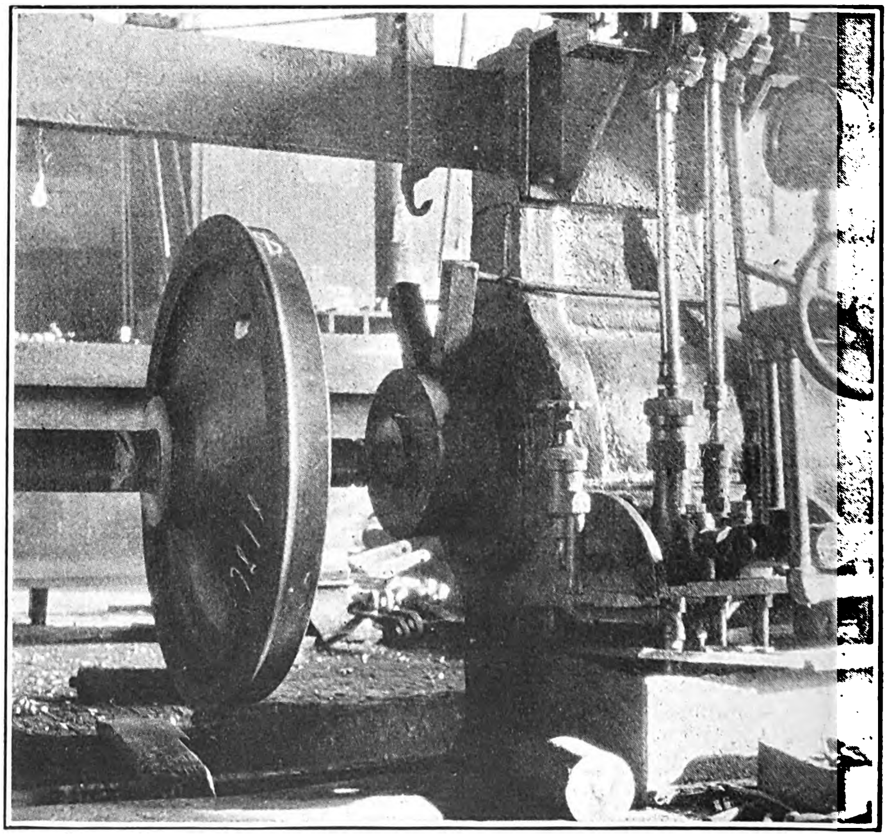
The face of the collar adjacent to the axle bearing is bored out ⅜ in. deep and of a diameter to permit the entrance of the axle-bearing flange. A ¼-in. fiber washer between the face of the axle-bearing flange and the bottom of the recess minimizes the flange wear. With this arrangement the clearance between the fiber washer and the axle-bearing flange face is underneath the recess wall and is protected from the ready entrance of dirt or brakeshoe dust. It is claimed that this feature has doubled the life of the bearing flange.

These adjustable dust-deflecting axle collars are rapidly replacing the small non-adjustable, non-dust deflecting axle collars furnished with the motors. The clamping bolts of the old type of collar worked loose very frequently and permitted the motor to shift and very often caused considerable damage. Not being provided with a recess space dirt and brakeshoe dust could enter the space between the flange face and the collar recess base, causing excessive wear with resulting short bearing life.

Axles Tested for Trueness on Wheel Press

CONSIDERABLE trouble and delay was experienced in the shop of the Capital Traction Company, Washington, D. C., in testing axles for trueness after wheels had been pressed on, until W. H. McCarty, master mechanic, devised a method for doing this testing in the wheel press. This consisted of installing an axle center on the wheel-press ram housing and another on the tailstock casting. After the wheels are pressed on, the completed axle is moved to these centers, revolved, and observations made as to trueness. Where defects are detected the axle is then removed and transported to the axle-straightening machine.

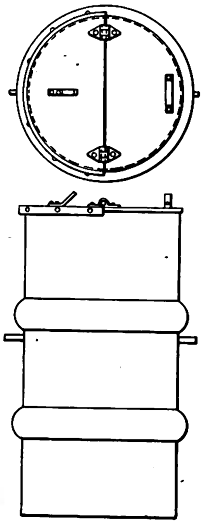
Prior to the installation of these centers it had been the practice to lift the axle from the wheel press and transport it across the shop to the wheel lathe, where the necessary tests were made. Every axle was tested in this manner and the loss of time at the end of a year for transportation alone amounted to a con-



Centers Installed on the Wheel Press at the Capital Traction Shop Makes Testing for Trueness Easy. The View Shows Axle Installed on Center Ready for Test siderable number of hours. Often the lathe was engaged on other work and the axle could not be tested immediately, so that there was a still further delay. This system has afforded a means of immediate testing at the press and has resulted in increasing production by eliminating unnecessary handling and shop delays.

Refuse Container Made from Gear Grease Drum

SUBSTANTIAL and safe shop waste containers for inflammable refuse have been made from empty gear grease drums by the Interborough Rapid Transit Company. In many cases these drums are not accepted for credit by the manufacturers. They have therefore been converted to this use at small expense. One head of the drum is completely removed and in its place is installed a self-closing cover with necessary hinges, stop and handles as shown in the accompanying sketch.



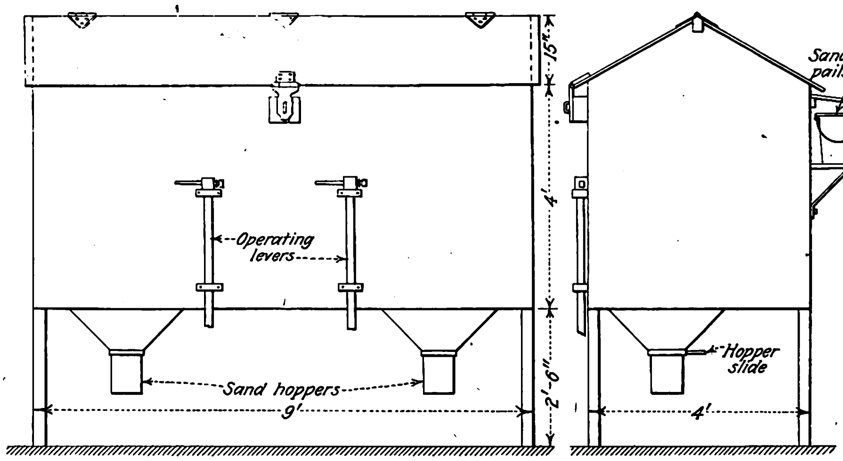
Refuse Container Made from Empty Gear Grease Drum

Handy Sand Storage Bins Prevent Failures

WATERPROOF sand bins located conveniently in the inspection barn and storage barn as well as outside of the buildings of the Virginia Electric & Power Company, Richmond, Va., insure a ready supply of dry sand for the carhouse organization or the motormen of passing service cars for the car sand boxes. These bins were designed and constructed in the company's shops, under the supervision of the master mechanic, W. J. Hicks. They are of pitched roof design and are built with 2-in. x 4-in. oak framing, to which is spiked 1-in. yellow pine planking. Two-ply tar paper covering the sides and top of these bins thoroughly protects the sand from rain and moisture. One side of the pitched roof is hinged for filling. These bins have a capacity of 5 cu.yd. of dry sand. Two Brill sand hoppers located in the bottom of each bin with hand levers on the front at a convenient height from the ground permit of quick and easy withdrawal of the sand. These levers, connected to the sand hopper slides through a series of bell cranks and rods, open the hopper slides. They are returned to a closed position by means of heavy coil springs. A shelf on the back of each bin, protected from the weather by a slanting roof, provides storage place for one or more pails for carrying the sand to the car sand boxes.

These bins are inspected and filled twice a day by the maintenance of way organization.

Since the installation, the number of cars reported for empty sand boxes has been considerably reduced. A marked decrease has resulted in sand box failures, ordinarily caused by partial filling.



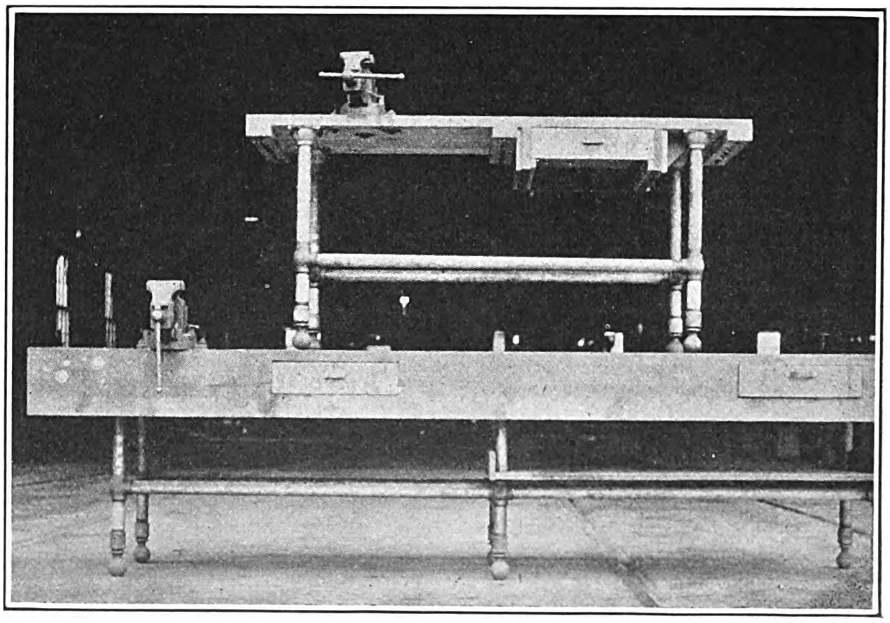
General Appearance of Sand Bins Used by Virginia Electric & Power Company at Richmond

Modernize, as you can *well* afFORD *to* retire *your* "Tin Lizzie" *car equipments.*

New Workbenches Improve Working Conditions

BELIEVING that the old workbenches in the shop of the North Carolina Public Service Company, Greensboro, N. C., had served their usefulness and were a detriment, Master Mechanic Seawell scrapped them and designed and built up-to-date benches.

Each department of the shop is now equipped with one or more



Neat and Rugged Pipe-Frame Benches Used in the Shop of the North Carolina Public Service Company benches with pipe framework of a design similar to those shown in the accompanying illustration. The framework is made of 1½-in. galvanized iron pipe threaded carefully and screwed into extra heavy long, round-bodied tees, crosses and flanges.

The various fittings are provided with right and left-hand threads to permit of complete assembly without the use of running threads or right and left-hand couplings. The assembled framework is strong and attractive in appearance. The top of each bench is made of 1½-in. oak planks assembled upon and fastened securely to cross members of 2-in. x 4-in. oak.

Spacious oak drawers provide for the storage of materials and tools. An iron ball foot is screwed into the bottom of each leg.

The bench top is mounted upon the cup-shaped flanges on the end of each leg and is held in position by means of through bolts, the heads of which are installed flush with the bench surface. Each bench is provided with a 6-in. vise.

These benches are all 36 in. wide and the heights vary from 34 in. to 40 in. and the length from 6 ft. to 12 ft., depending on the location and the character of work to be performed.

New Equipment Available

Portable Chain Saw

MEETING a demand for a mechanical portable saw to cut lumber and timber at the job, the Reed-Prentice Corporation, Worcester, Mass., is marketing the Wolf portable chain saw. The equipment is provided with a 24-in. saw and is supplied with reversing and foot-controlled switches so that it can be handled by one man.

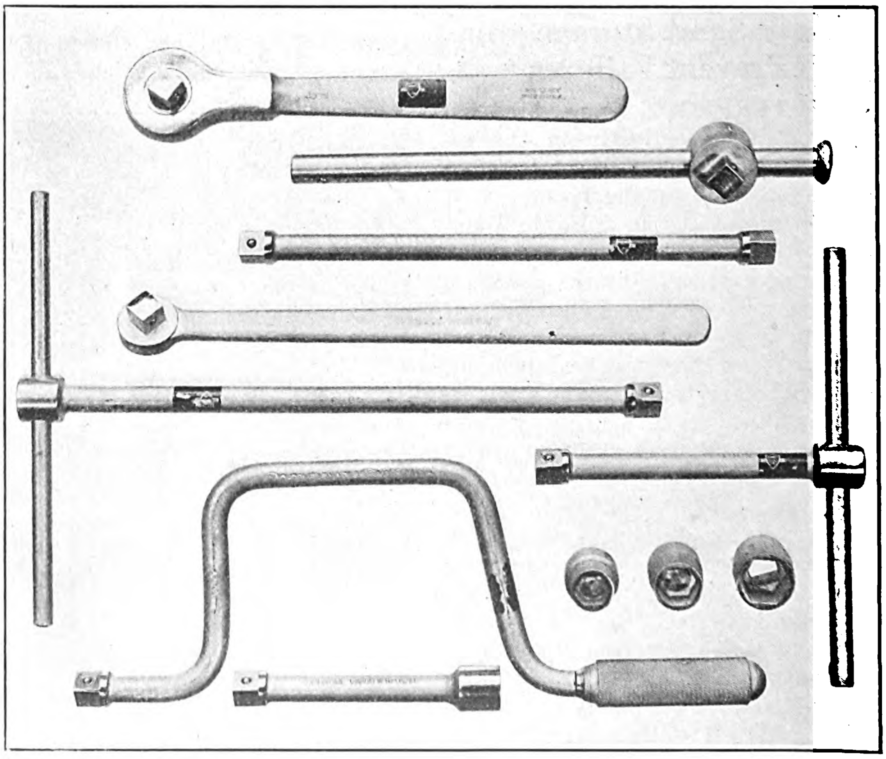
The saw blade is made of two pieces of selected saw steel with spacers to form a groove in which the diameter teeth travel. Provision is made for an oiling groove and reservoir in the spacers. Gears are of steel and the gear case is packed with heavy grease. All shafts are hardened and ground and run in ball bearings. The machine weighs 83 lb. and is driven by a 1½-hp. motor, this being supplied in any voltage desired.

Chrome Vanadium Socket Wrenches

DETACHABLE head socket wrenches made of CV chrome vanadium steel are among the new products of the Bonney Forge & Tool Works of Allentown, Pa. The sockets are forged from solid bar stock and should not be confused with sockets cut from bar stock or stamped from tubing. The manufacturer claims that the forging process retains unbroken the grain of the steel and this process plus the use of chrome vanadium makes an exceedingly strong, detachable head, socket wrench. This exceptional strength also makes it possible to manufacture these wrenches with very thin walls, which proves of decided advantage for close corner work.

In addition to the line of sockets, this company has also developed a complete assortment of handles, which are forged from chrome vanadium steel. These include solid offset handles, ratchet offset handles with reversible lugs, "T" handles in various lengths, sliding "T" handles, ball bearing "brace type" handles of various lengths and extension bars for reaching inaccessible places.

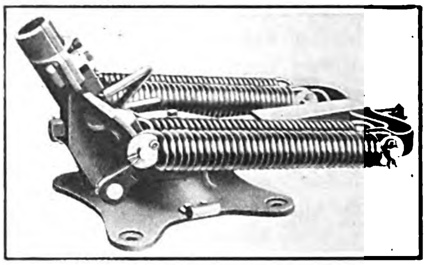
A ½-in. square lug, which has become practically standard for all detachable head socket wrenches, is used by the Bonney Forge & Tool Works. This makes it possible to use the new socket wrenches in connection with any detachable head socket wrenches which a mechanic may already have. Adapters are also provided so that the handles may be used for the very large size sockets, many of which use a ⅝ in. square.



Line of Chrome Vanadium Sockets and Detachable Handles

Sensitive, Lightweight Trolley Base

BY PROVIDING parallel double-race bearings a trolley base which is extremely sensitive, light in weight and free from friction has resulted. This is being introduced by the General Electric Company, Schenectady, N. Y., and designated as type US-20. The bearings, of tapered roller construction, cause pressures to be spread evenly over the entire bearing surface, as the pressure at the top and bottom of the swivel is practically perpendicular to the roller. The base hangs on the roller bearings, giving the swivel greater freedom and reducing wear.



New Lightweight Trolley Base

Association News & Discussions

Optimism Pervades C.E.R.A. Meeting

Necessity of Replacing Old and Heavy Cars by Up-to-Date Equipment Emphasized—Marked Success Has Attended Modernization of Many Properties in Central Territory

STILL another milestone in the recovery of the electric railway lines in Michigan, Indiana, Ohio and Kentucky was marked by the annual meeting of the Central Electric Railway Association held at the Commodore Perry Hotel in Toledo on Feb. 3 and 4. Growing passenger earnings were reported by many of those in attendance. As a result, a distinct note of enthusiasm and optimism pervaded the meetings and the discussions taking place. The value of improved equipment and facilities in winning reduced costs, increased business and a friendly public was pointed out and emphasized over and over again by those who had successfully turned the corner toward decidedly improved conditions, by the application of modern merchandising ideas to the transportation business.

PRESIDENT JEFFRIES SOUNDS KEYNOTE

"Notwithstanding the continued competition of rapidly growing numbers of automobiles, owners and managers of electric railways feel more optimistic than they did last year," said President G. K. Jefferies in his opening remarks. He attributed some of the improved traffic experienced by railways to the increased difficulties attending the use of automobiles together with a growing realization by the public of the cost of using automobiles for ordinary transportation purposes. But he also pointed out that the convenience of the private automobile is such that improved facilities and higher class service on the electric railway lines are necessary to win any appreciable part of the increased demand for transportation created by the coming of the automotive vehicle. "This," he said, "can only be given by a line in first-class physical condition. Some electric railways have good equipment but a roadbed in poor condition. Others have first-class track but old, out-of-date cars. Very few have both track and equipment of high grade."

Mr. Jeffries called attention, however, to the fact that those properties that have put both their track and cars in good condition, and that have taken advantage of the service improvements which this makes possible, are the ones that have been successful in building up a profitable business. Since the alternative of using an automobile is always present, people will not put up with discomforts and inconveniences to which they were formerly accustomed.

"The traveling public must be put in such a state of mind by improved equipment and facilities," said the speaker, "that they will look forward to a trip over electric lines with pleasurable anticipation instead of regarding it as a necessary evil to be endured. The day is gone when a line of rails, some vehicles with wheels under them and motive power, but without any of the refinements demanded by the public, can long exist; the competition by more attractive agencies is too great, regardless of the cost."

Combined with these material things which can be seen and examined, the speaker held that the attitude of employees toward their work and their company and the reflection of this attitude in their dealings with the public represent factors which spell ultimate success or failure for a given operation. Here again he called attention to the important part played by the condition of the physical property. If the employee has pride in his company and in its service, he can be trained much more easily and successfully as a salesman of its service.

IMPROVED EQUIPMENT IS PAYING INVESTMENT

In a symposium on the results accomplished by new rolling stock, railway managers who have had sufficient experience with improved equipment on their properties testified to the permanency of the improvements effected. George MacLeod, vice-president and general manager Buffalo & Erie Railway, opened this part of the program. From the experience on his property Mr. MacLeod held that there is little question but that more comfort and better appearance in equipment will give increased revenue. Here, however, the speaker insisted that operating income rather than revenue is the all-important figure to be considered. When the question of equipment is approached from this angle, the type of car used by a given property becomes one of the most important factors that determine the final result accomplished.

Taking the experience of the Buffalo & Erie property specifically, Mr. MacLeod cited the results accomplished by the complete replacement of former heavy equipment with new light-weight, high-speed interurban cars operated by one man, and that weigh only 19 tons. Combination air-magnetic brakes permit quick stops to be made despite the high operating speed. These cars were first placed in operation in February, 1925, and have since shown a reduction of 50 per cent in power costs in comparison with the old equipment. An attractive saving in track and roadway maintenance was made, tie spacing was increased and at the same time a longer life of the tie structure is expected than was formerly obtained with closer spacing under the old equipment. It is also expected that rail and special work life will be doubled as the result of the lighter cars. Equipment maintenance costs have been reduced 50 per cent. It costs approximately one-third as much to rewind armatures and fields on this car as on the old equipment.

For the twelve months of 1925, as compared with 1924, there was an increase in passenger revenue of 7.5 per cent. Despite an increase in car-miles operated of 14.4 per cent, operating costs were 12.8 per cent less than in 1924. This represented an actual decrease in car-mile cost of 23.3 per cent. Due to very unfavorable weather conditions in 1926, revenues during the summer were less than in 1925. The riding for the year, however, was 3.8 per cent higher than in 1924, and the months of November and December showed increases of 4.2 per cent and 5.2 per cent respectively over the corresponding months of 1925.

L. J. DeLamarter, vice-president and general manager Grand Rapids Railway, testified to the permanency of the results accomplished there with new equipment, in a written discussion that was read by J. W. Knecht, general superintendent of the property. "After seven months of operation of our new cars I am as enthusiastic as ever over them and over both their tangible and intangible value to the property," said Mr. DeLamarter. Figures were cited to support the statement that the new cars have brought actual revenue increases. These show that during each month since the Grand Rapids rail coaches were placed in service the proportion of increase in passenger revenue on the three lines so equipped has been considerably higher than the increase shown on the balance of the lines in the city. During the seven-month period from June to December, 1926, passenger revenue increased 3.21 per cent over the corresponding period in 1925 on the three lines upon which the new coaches are operated, while the passenger revenue for the same period on all other lines increased only 1.91 per cent.

BRINGING BACK PATRONAGE TO THE INTERSTATE

L. M. Brown, general superintendent Interstate Public Service Company, described the equipment improvements that have been made on that property during recent years. Since 1920 there had been a gradual decrease in total passenger revenue on this property each year from the preceding year, he said. In 1926 the condition changed, with a substantial increase which brought passenger revenue to only 8 per cent below the figure for 1920. Since the installation of parlor-buffet and sleeping car service a check of the longer-haul travel — that is, passengers traveling 100 miles or more—shows an increase of 40 per cent in this class of business. This has not been erratic but has consisted of a steady, constant growth. It is attributed very largely to the character of the equipment operated and the consequent improvements in service that have been made. The speaker expressed the opinion that new cars alone will not bring permanent increases in revenue; that satisfactory results can only be obtained by combining with new equipment such improvements in service as will meet the demands of the present-day traveling public.

W. R. Power, general manager Appalachian Electric Power Company, expressed his thoughts on the subject of increasing passenger revenue in a letter which was read by H. L. Brown, chairman of the program committee. R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, talked extemporaneously on the results of Youngstown's experience with modernization and with bus operation. Mr. Graham held that there is no mysterious rubber urge in transportation. He cited results obtained on parallel car and bus lines serving the same territory to show that careful analysis of the transportation situation under each specific combination of circumstances encountered is necessary for intelligent appraisal of the measures which will bring best results from a financial standpoint.

INDUSTRY PAYING FOR 12,000 CARS

The electric railway industry is paying annually, in the form of excessive operating costs, for 12,000 new cars which it is not receiving, according to Charles Gordon, editor ELECTRIC RAILWAY JOURNAL. Mr. Gordon again showed lantern slides which have been presented before other sectional association meetings to illustrate the heavy cost which the industry is paying for the operation of heavy and obsolete equipment.

Further discussion of the present car situation in the industry, and of the importance of equipment improvements, was included in papers prepared by J. H. Alexander, president Cleveland Railway, and M. B. Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company. Mr. Alexander's paper was read by R. W. Emerson, vice-president Cleveland Railway. He urged the importance to the industry of improvements in cars and car equipment and called on all manufacturers and operators as well to do their part in helping to make the car exhibit at the Cleveland convention next fall a real inspiration to the entire industry. Another point which was strongly stressed was the value of the work which has been done by the American Association committees on essential features of modern cars and on unification of car design. H. H. Adams, who has been chairman of the latter committee for a number of years, extended an invitation to any company faced with the problem of selecting the proper equipment for a given service to confer with the committee.

An abstract of Mr. Lambert's discussion of the car situation is printed elsewhere in this issue. This complete session on the subject of rail equipment was followed by an afternoon devoted to the bus. Walter Jackson, railway and bus consultant, New York, took as his subject the proper use of buses by electric railways. T. W. Noonan, general manager Pittsburgh Motor Coach Company, discussed the new 25-cent express service which has been developed in that city to attract automobile riders who formerly used private cars in daily travel. An abstract of his paper is printed elsewhere in this issue.

Mr. Jackson cited the experience of more than fifty electric railway properties which have operated buses for some time in cities ranging in size from 25,000 population and less to metropolitan conditions. In practically all such situations, he found that the operation of buses as street cars on rubber tires, while in many instances serving as a stop-loss measure to eliminate heavy track and paving construction and reconstruction charges, fails to show any really substantial revenue building possibilities. The speaker held that the most attractive field offered for the extension of bus operations at a profit, particularly in large cities, is in the direction of a quasi-rapid transit service to places more than 4 or 5 miles from the business district. He held that success in such operations demands a rate of fare at least double that of the car fare, with a character of service so superior that it will draw largely from the ranks of persons using personal motor cars, with whom expense is secondary to character of service. To this end short headways, speedy operation, seating comfort, adequate lighting and ventilation and other conveniences are important. The need for high schedule speeds, for the elimination of stops and for worming in and out of congested traffic dictates, according to Mr. Jackson, a small vehicle of comparatively limited seating capacity and limited width.

An unusual feature of the program was a general conference of operating executives devoted to the subject of building more profitable business for the interurbans. In this meeting, which, in the absence of J. P. Barnes, was presided over by W. H. Sawyer, president American Electric Railway Association, a high pitch of enthusiasm pervaded the discussion. Various speakers from properties which have already accomplished notable results in recovering traffic formerly lost to automobiles, and in generally improving their financial showing, testified to the wisdom of spending money for improvement of facilities and modernization of operation. Mr. Sawyer was also the principal speaker at a dinner on Thursday evening. An abstract of his remarks is printed elsewhere in this issue.

The subject of maintenance occupied most of the final session on Friday. Papers by H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, and by W. T. Rossell, general manager Pittsburgh Railways, will appear in abstract in a later issue. Another paper of general interest on the experiences of the Indiana Service Corporation in reshaping its financial structure prepared by R. M. Feustel was read by H. E. Vordermark.

M. Ackerman, general manager Lake Shore Electric Railway, Cleveland, Ohio, was elected president for the ensuing year.

Financial Reorganization Saved the Original Investment*

By ROBERT M. FEUSTEL
President Indiana Service Corporation

THE chairman of your program committee is responsible for the thought that the plan of the Fort Wayne reorganization, consummated in 1920, might be of some interest to association members. To those actually engaged on the plan, the path seemed very clear, not because there was any unusual foresight used but because there was only one way out. It was the case of a fair-sized utility finding itself broke, with no banking and very meager merchandise credit. Like all utilities, there was some reasonably fixed lower limit to gross earnings, and to find this limit, pay merchandise creditors and start anew on what history had taught was the fair earnings to be expected was the rather simple task. The only difficulty was to persuade bondholders and general creditors that you might settle these problems more promptly and at less cost out of court.

The Fort Wayne & Northern Indiana Traction Company was the result of a reorganization in 1911 of the properties of the Fort Wayne & Wabash Valley Traction Company. This predecessor company had been the result of consolidations made in 1903 of the Fort Wayne city line, light and power properties in Fort Wayne and a 114-mile interurban line from Fort Wayne to LaFayette. By 1917 about 60 miles of additional interurban lines had been built and light and power business developed in 25 small communities adjacent to the interurban lines.

COMMON STOCK ISSUED AS BONUS

The gross revenue in 1917 was, in round figures, $3,000,000. The actual investment in physical property was $14,000,000, of which $10,000,000 was in city and interurban lines and $4,000,000 in light and power property.

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*Paper presented before Central Electric Railway Association, Toledo, Ohio, Feb. 4, 1927.

Against this property were outstanding $9,000,000 of underlying bonds of four issues and $3,000,000 of Fort Wayne & Northern Indiana first mortgage and collateral trust issues. In addition, there were $2,500,000 of preferred stock and $4,000,000 of common stock. The total was $12,000,000 bonds and notes and $6,500,000 of preferred and common stock, making a total of $18,500,000 of securities against $14,000,000 of cash actually invested in the properties. I suppose that some years ago it would have been rank heresy for a utility operator to have admitted that more face value of securities were outstanding than there was actual money invested in physical property. With the considerable experience that the writer has had in investigating the history of utility properties for utility commissions it has always seemed to him that the utility operators had failed to make the most before utility commissions of the very natural and logical history of the growth of their financial structures.

The property under discussion had been financed in the commercial days of unrestricted competition when limited franchises in cities and expensive private right-of-way lines in the rural districts afforded all the investor had in the way of protection of his investment. City councils and county boards were the political wasters and they were changing at least every four years. The franchises, many of which contained burdensome provisions, were usually good only for the life of the bonds; that is, 25 to 30 years. For traction properties the automobile had not come into real commercial use and the interurban gave promise of being a splendid field for investment.

One of the common methods in the past for providing construction money for the traction systems was to sell a $1,000 bond, $1,000 of preferred and $1,000 to $2,000 of par value common stock for, say, $2,500 to $3,500. Just what cost to assign to the different classes of securities in a transaction such as this depended upon the opinion of the purchaser.

A certain amount of the common stock was, of course, taken by the promoters, and some was, no doubt, used in obtaining help from local influential citizens in obtaining necessary grants, rights-of-way and franchises. The resulting financial structure was that the bonds and preferred stock at par usually represented the cash in the property and the common stock represented about 25 per cent additional for promotion and cost of establishing the business. If the enterprise was successful the common stock would be made good; if not, even the bonds and preferred stock might become speculative.

WAS RESULT OF CONDITIONS THAT EXISTED

As stated, it seems to the writer that such a financial structure was a perfectly logical outcome of the highly competitive conditions under which those early traction utilities were built and the promoters were well entitled to any profits they could make in gathering so much money into the development of the new and still speculative utility field. Within a period of fifteen years poor guesses as to choice of territory in some cases and the development of the automobile in all cases changed what was a perfectly legitimate business enterprise into a task of intelligent salvaging.

COMING MEETINGS
OF
Electric Railway and Allied Associations

Feb. 18—New York Railroad Club, meeting, Engineering Societies Building, New York City, 8 p.m.

Feb. 18-19—Kentucky Association of Public Utilities, annual convention, Brown Hotel, Louisville, Ky.

March 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

The Fort Wayne & Northern Indiana securities structure was the result of such financing, and it is perfectly obvious that a utility property bonded up to 85 to 90 per cent of its construction cost must earn a good return from the start else the sheriff will not be far in the offing. This property, like others of a like character, would no doubt have come through well if it had not been for the miraculous development of the private automobile. A safe margin for bond interest could not be earned, and yet new money was needed for city lines, light and power and even for interurban improvements and extensions. Depreciation, a rather unwelcome and reasonably unknown visitor, also came in and demanded food from the operating revenues. The solution was comparatively simple; i.e., save what could be salvaged of the original cash investment and let the stockholder go by the board.

It was such a condition that confronted the Fort Wayne & Northern Indiana properties at the beginning of 1917, just ten years ago. On legal equities the bondholders would, of course, come first. It was indeed fortunate that the stocks and bonds had been sold in joint blocks, because if the bondholder could be saved it meant that the stockholder might lose nothing much except what had been his anticipated profits. This, of course, was not literally true in all cases, because some of the securities had changed hands. It was true in the main, however.

The most urgent need was money for rehabilitation so that better service and then possibly increased revenues might result. It was at this point that the only real unusual feature of the reorganization occurred. A default was started in 1917 on $11,500,000 of bonds, and interest was paid on only $500,000 of real underlying bonds and, of course, principal and interest on car trust certificates. With some $500,000 owing to supply dealers, it was explained to the bondholders that future necessary credit made it desirable that these merchandise creditors be paid. A receivership might start rather expensive litigation and would surely hamper the improvement of the property from earnings, as court orders for improvements would be difficult to obtain.

Because the operators were too innocent to know that you can not default for such a length of time without a receivership, it was tried, and for 2½ years such default was made until the company was ready for a short voluntary receivership and reorganization. During this time the merchandise creditors were paid off and almost a million dollars was expended in new cars and improved power facilities so that net earnings might be improved. This task was also made much easier because it occurred during the difficult war period when security holders and creditors were busy at many other tasks.

NEW FINANCIAL PLAN SAVED ORIGINAL INVESTMENT

The new financial plan was simple indeed, even though it did require much co-operative work among the several sets of bondholders. The first lien bonds were cut from $9,000,000 to $4,700,000. The only slip in the plan came in the issue of $4,800,000 of income bonds as the next set of securities. While the interest on these bonds need not be paid unless earned and is not cumulative, for future financing it would have been better to have had a first preferred stock. An issue of $2,159,000 of 7 per cent non-cumulative preferred and $2,159,000 of common stock completed the new financial structure. This might appear to be a rather meager set of securities to exchange for first mortgage bonds and preferred stock, all of which had formerly meant real cash investment. The new securities, however, did equal in face value all of the cash which had been put into the property, including the forgone interests for the three years of default.

With the net earnings during the default period put into betterments and the generally improved business conditions after the war, the task was made easy. Some financing was done by first mortgage bonds, as that issue now represented only 35 to 40 per cent of the investment. The income bonds paid 3, 4, 5 and 6 per cent for the succeeding years after 1920 and have been on a sound basis ever since. Light and power and city lines earnings increased sufficiently to make possible dividends on the preferred and common stock. In other words, there were fair earnings available for return on all of the cash actually invested in the property. Before such dividends were actually paid on the common and preferred stock the properties were sold to our operating syndicate, where the preferred was converted into common stock to make possible the issuance of new preferred for improvements to be sold on a customer-ownership plan.

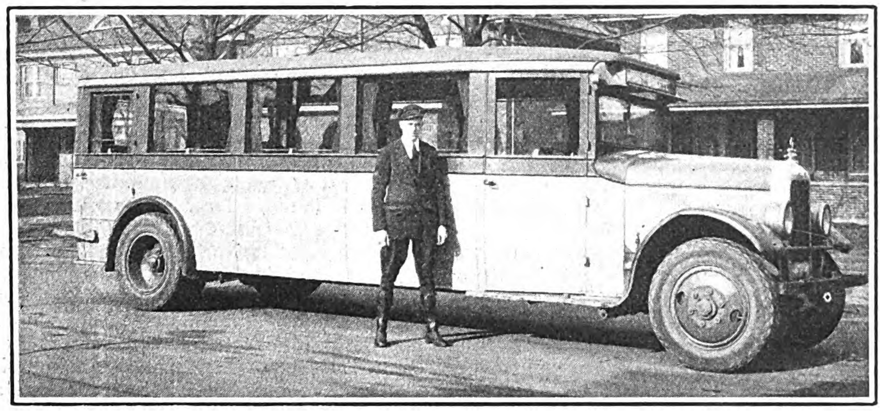
There is nothing at all remarkable

about the plan we have outlined except that the new securities did represent all the cash in the properties at face value and were so arranged that future financing would be accomplished, and if earnings would have been low the sheriff was not so near by. The holders of the common and preferred stocks received an average above par for their holdings at the sale and the first mortgage 5 per cent bonds and the 6 per cent income bonds are now selling for around 95 in the open market.

Congestion Relief with de Luxe Coaches*

By T. W. Noonan
General Manager Pittsburgh Motor Coach Company

Millions of dollars are being spent for policemen, signal systems, street alterations and what not to relieve traffic congestion. Yet every change toward expediting traffic is soon offset by the increase in the number of personal automobiles. We cannot sweep back the ocean of personal cars by condemning their wasteful use of street space, whether running or parked; nor by finding fault with their owners because they choose to roll their own, regardless of expense. We have no right to call for the removal of the personal car unless we can offer something of equal or greater value in its place.



The New Coaches Seat Nineteen Persons in Comfort. Because of Their Size They Are Easier to Handle in Traffic than the Large Buses Used Previously

The personal car has developed a desire for faster and more luxurious transportation than can possibly be given by a low-fare electric railway service. That desire has become so set with many automobilists that they are willing to subject themselves to heavy expense and much annoyance rather than return to what they deem lower-grade transportation.

Buses with narrow seats, skimped aisles, insufficient lighting, poor ventilation and poor springs are surely not the vehicles with which we can draw the autoists and so work toward the only practical solution of congestion, to wit, reduce the number of vehicles which make inefficient use of their highway space privileges. Such operation stands even less chance of doing good when an inferior type of mass transport vehicle is accompanied by headways longer and fares higher than prevalent electric railway standards.

In making the foregoing assertions, I am sticking to the experience of the Pittsburgh Motor Coach Company. To put the matter in a nutshell: We have found that long-headway buses do not pay and that short-headway de luxe coaches do pay. In both cases, traffic drawn from the associated Pittsburgh Railways was a negligible factor because the coach fare is 25 cents while the street railway schedule is 10 cents cash, 8⅓ cents token and $1.50 weekly pass within the same area.

Following the acquirement from an independent operator of a line joining the business and amusement centers of Pittsburgh and East Liberty, on Aug. 14, 1925, we originated a 5.7-mile route from downtown Pittsburgh to Squirrel Hill, a high-class residence district lying just beyond Schenley Park. For this service we installed 29 and 25-seat buses. On May 24, 1926, we originated a 6.6-mile route to Point Breeze, another fine residence district. The vehicles put on were 29 seaters.

Both the Squirrel Hill and Point Breeze routes make use of 2 miles of boulevard emanating from downtown Pitsburgh. The Squirrel Hill route also makes use of Schenley Park and, in general, is not near trolley territory. The Point Breeze route, after leaving the boulevard, is on tracked streets for a good part of the way.

Increase in Business of 20 to 58 Per Cent

The Point Breeze route is of greatest interest because it covers results from changes in both equipment and service, whereas the other lines are still being operated with buses instead of de luxe coaches.

Beginning Dec. 6, 1926, we changed Point Breeze from 29-seat buses to 19-seat coaches. These coaches have a wheelbase of only 210 in. compared with the 255-in. wheelbase of some of the others. They are therefore much easier to negotiate in downtown streets. The over-all length is also only 24½ ft. against the 28½ ft. length of the older vehicle. The reduction of over-all width from 90 in. to 81⅝ in. has been found of substantial value in avoiding accidents and in getting by other vehicles.

Because of the better clearance conditions and smaller capacity, we were able to cut the running time from 38 minutes to 30 minutes. In addition to making this time saving for the patron, we save him a possible ten minutes in the rush hours by shortening the headways from twenty minutes to ten minutes, and a possible further saving of eight minutes in the non-rush hours by shortening the headway from twenty minutes to twelve minutes. Business increased so rapidly that the six coaches soon were unable to cope with it. So we now throw in two of the 29 seaters to help the morning peak and three 29 seaters between 4 p.m. and 6 p.m.

The total increase in vehicle-miles offered is about 50 per cent. The increase in revenue is about 58 per cent. This is in comparison with the November weeks immediately preceding, as this route was not in operation in December, 1925. Probably some of this increase was due to the more wintry weather and Christmas shopping stimulation, but it will be seen from results on the other routes that the new type of equipment and shorter headways were responsible for the greater part of the gain.

Under the first operation, November showed earnings of $170 a day or 29 cents per mile, but costs were 32 cents per mile.

Under the new operation, December showed earnings of $301 a day. Earnings were 32.3 cents per mile, but costs only 26 cents per mile.

The table on page 299 shows the details of earnings and services in two weeks preceding the change and the first four weeks thereof.

Naturally enough, there was no large increase in earnings per vehicle-mile in view of the increase in number of miles offered and the reduction of seats per vehicle. The important point is that a loss of 3 cents per bus-mile has been turned into a profit of 4 to 5 cents per coach-mile.

Not the least interesting feature of the new service is the effect it has had on night travel. Even the earnings per vehicle-mile have been increased by 50 per cent. We cannot help concluding that this large increase in night travel, when there are no parking restrictions to hamper personal driving, must be due to having a service attractive enough to make the theater-going autoist keep his machine in the garage.

On the Squirrel Hill route we merely changed our service standards beginning on Dec. 6, 1926. Operation for the present continues exclusively with 29-seat single-deck buses. However, the peak headways were shortened from twelve minutes to ten minutes. Off-peak headways remained at fifteen minutes. The terminal-to-terminal time is 30 minutes, which is equivalent to a schedule speed of 11.4 m.p.h. It should be explained here that our layovers on

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*Abstract of a paper presented before the Central Electric Railway Association, Toledo, Ohio, Feb. 3, 1927.

RECORD OF EARNINGS FOR SIX WEEKS BEGINNING WITH NOV. 22

Week begun	Miles	Total Revenue	Revenue, Cents Per Mile All Day	Revenue, Cents Per Mile 7 P.M. to 11 30 P.M.
Nov. 22	3,507	$1,011	28.8	13.4
Nov. 29	3,530	1,108	31.4	14.2
Dec. 6	5,562	1,668	30.0	20.8
Dec. 13	5,554	1,829	32.9	25.6
Dec. 20*	4,753	1,556	32.7	20.5
Dec. 27*	4,836	1,582	32.7	19.4

*Five-day weeks.

all routes at the downtown end are no longer than necessary to interchange passengers, and they are never more than two minutes at the uptown end. The cost of operating these 29-seat buses is 34 cents per mile. They earned 46 cents per mile in December, 1926, an increase of 20 per cent over December, 1925.

Counting from the beginning of independent operation in November, 1916, the East Liberty route had been in operation ten years, so it might have been assumed that the market for 25-cent riding was pretty well stabilized. Our experience, on the contrary, proves that we were far from saturation point, although we still have no de luxe coaches on this route.

The equipment change on this route was to eliminate the double-deck bus completely. It was not only unsuitable for the curves and hills of this line, but so unpopular as a carrier that it did not earn any more per mile than the 25 and 29-seat units. The theoretical seating capacity of these double-deckers was 52. Their actual capacity for the greater part of the year was 22—the number of seats on the lower deck. Unlike the operation on Fifth Avenue, New York, or the Lake Shore, Chicago, there is no large number of sightseeing objectives to draw passengers to the upper deck. A special check made in the still balmy weather of September, 1926, showed that the upper deck was little used even then.

The cost of running the double-deckers was 42 cents per mile. The cost of running the single-deckers over the same route is 32 cents per mile. We did not alter the headways from the six-minute peak and the eight-minute off-peak, except that on Saturdays from 12 o'clock noon headways are on a five-minute basis. Since the effective seating capacity of the double-deckers was only 22, we really increased the number of seats available by confining ourselves to the 25 and 29-seat single-deckers. The running time between terminals is 26 minutes, which corresponds to a schedule speed of 11½ m.p.h. Earnings in December, 1926, were 54 cents per mile, which was 20 per cent more than in December, 1925.

RAISING THE STANDARD IN OTHER WAYS

In our endeavor to give the autoist something good enough to tempt him from the use of personal cars during busy hours, we have made several changes in other directions. In body color, we are changing from a yellow to a rich and dignified combination of dark gray below and sapphire green above the belt line.

In seating, the scant dimensions and rather stiff upholstery of the buses have been succeeded by twin chairs on one side of a 16½-in. aisle and single instead of double seats on the other side, all spaced on 30 in. centers for real knee-room. These chairs are upholstered in air-cushioned Spanish leather. The single chairs are 23 in. wide over the arm rests, the double chairs 35 in. A set of air-cushion seats extends across the back of the coach.

Appreciated features are the mirrors on the posts between the extra long windows and the eight 21-cp. dome lights, which eliminate former complaints about light too dim for reading. The better riding quality of the coaches also makes it easier to "read as you ride, while we do the driving."

In fare collection, we have tried to avoid the eyesores and earsores of register rods, cords and bells. The passenger simply drops his fare into a locked box finished to correspond to the interior trim of the coach. There are no cords or rods to irk the eye. Only an inconspicuous cord for signaling the operator is carried along the side of the coach within convenient reach of the rider. We display no printed matter whatsoever.

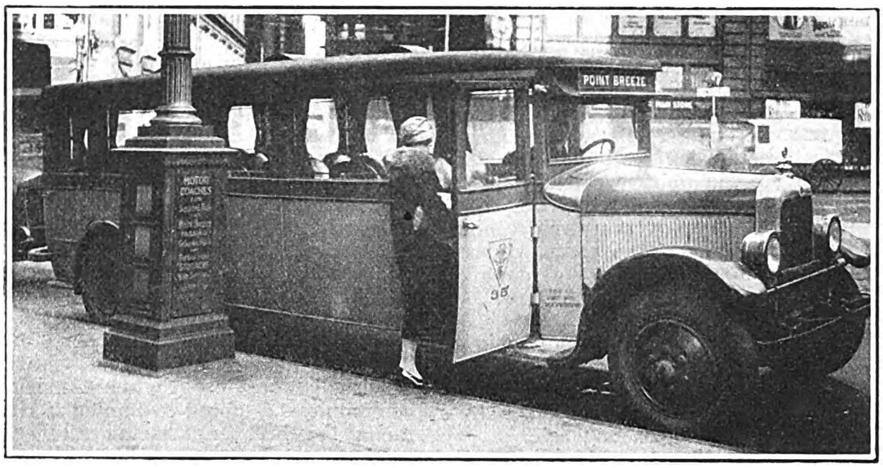
The bonus and free uniform features given originally in addition to a wage scale of 50 to 55 cents an hour were eliminated in favor of a wage scale corresponding to that of the Pittsburgh Railways.

We duplicated the 1½-cent increase of the railway, made on Jan. 1, so that the present scale is 61½ cents for the first three months; 66½ cents the next nine months and 68½ cents after the first twelve months. The first result has been a complete absence of turnovers since Nov. 1. A second result has been a decrease of 35 per cent in accidents per vehicle-mile.

Our first publicity for the improved Point Breeze service was to run the first two coaches in with the others, but the chauffeurs gave each patron a card stating that a full service with coaches of the same design would be inaugurated on Dec. 6; also that the new schedule would be handed out with them. On Dec. 2 we mailed a letter to 3,200 householders in the Point Breeze area, the names being selected from the customer list of the associated Duquesne Light Company.

It is hardly necessary to add that news of the de luxe coaches on the Point Breeze route spread quickly to the customers on the Squirrel Hill and East Liberty routes. We have been asked by them when will they be favored likewise.

Our present plans contemplate the purchase of ten more coaches, making a total of sixteen. Two of the new ones would be added to the Point Breeze route to permit 100 per cent operation of such coaches on a 7½-minute headway instead of the present ten-minute off-peak headway. The remaining eight will be put on Squirrel Hill in preference to East Liberty, because of the more industrial character of East Liberty riding, but eventually this type of coach will be our standard except for the possible use of the larger buses during peaks.



Panel Attached to Lamp Standard Shows Where Coaches Stop in the Business District

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Create the Demand for Modern Street Cars*

By M. B. Lambert

Transportation Sales Manager Westinghouse Electric & Manufacturing Company

THE American electric railway industry has a more intimate responsibility to the public than any other industry. The nature of its service brings it into more intimate contact with a larger part of the public than do the steam railroads or any other public utility. Hence the electric railway executive has a far greater responsibility to his community than any other citizen in that community. The industrial and social progress of every community depends to some degree upon the vision and enterprise of its electric railway executive. The character of the support and co-operation that he enjoys from the public he serves also depends very largely upon the spirit and enterprise that he imparts to his entire organization and the character of service rendered to the public.

The exhibition of modern street cars

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*Address presented before Central Electric Railway Association, Toledo, Ohio, Feb. 3, 1927.

and other developments in the art of transportation at our annual conventions brings before every electric railway executive once each year all of the advances the manufacturers and operating engineers have evolved for the betterment of community transportation. Every electric railway company that has developed improvements in car design owes it to itself and the industry as a whole to exhibit these at the annual convention. It is largely through such co-operation and exchange of ideas that the industry advances. The progressive executives must of necessity carry the burden of encouraging and exciting interest and enthusiasm in the others, because if they do not their own efforts and that of the industry, as a whole, are materially hampered.

THE CO-OPERATION OF THE MANUFACTURERS

The manufacturers serving the electric railway industry are enjoying a very extraordinary co-operative set-up, fostered by the American Electric Railway Association and the technical press. In spite of this there is a feeling in some quarters that the manufacturers are not doing all they might do to promote the welfare of the industry to the degree that it justifies.

What are the extraordinary things the association and the technical press are doing to encourage the manufacturer? The most outstanding are:

The American Electric Railway Association provides for membership of operating companies and manufacturer companies on an equal basis. Buyer and seller are brought together in a common co-operative plane.

The association has established the manufacturers' co-operative committee, the chairman of which reports at all its executive committee meetings and has the privilege of the floor at annual conventions to submit a complete report of progress.

The association president and the managing director have for several years past devoted considerable time and effort in calling together numerous manufacturing representatives, urging them toward greater co-operative effort in promoting the adoption of modern equipment by the industry; in fact, helping the manufacturers to increase their sales.

The association set up an engineering committee to study and promote modern standard city and interurban cars, and, with association funds, published in book form the report of this committee.

The ELECTRIC RAILWAY JOURNAL staff, co-operating with the association executives, have called conferences of manufacturers at recent conventions and displayed charts and data showing the opportunities for replacement of the old with the new, modern equipment. In addition they have had these studies printed in attractive pamphlet form and distributed throughout the country—*Electric Traction* and *Forbes* offer prizes annually for special operating accomplishments.

In general, the situation is unique in that the progressive electric railway executives and their national association executives for the past several years have been the "loud speakers" in urging the adoption of modern cars and equipment in a much more pronounced way than the manufacturers themselves have been. This year the association has broadened the scope of the manufacturers' co-operative committee, perhaps with the idea that this may arouse greater interest among all manufacturers to assume to a greater degree their own part in adequately promoting the development and sale of cars that will attract greater riding and reduce operating costs.

FACING A NEW SITUATION

The electric railway industry is no longer a monopoly in the sense that it is without competition. The private automobile is a formidable competitor, and in another sense the auto bus is a competitor to many electric railway manufacturers, while it at the same time opens up new markets to the larger electric railway manufacturers. Every electric railway manufacturer could consistently take his hat off in deference to the commercial progressiveness of the automotive manufacturing group. They have displayed in good measure the enthusiasm, courage and salesmanship that a youthful industry in this era may consistently possess. The electric railway manufacturers may with profit imbibe much of this enthusiasm and courage. As Admiral Schley said, "there is glory enough for all." The auto bus is here to stay, and so is the electric railway. Each has a service to perform distinctly its own, and the demand for transportation service in our progressive American communities is going to command right along the best engineering and sales talent that both forms of transport have to offer.

The chairman of the manufacturers' co-operative committee of the American Electric Railway Association has laid down a program for this year's activity, in addition to its publicity functions. The plan is to drive home in the minds of every manufacturer that it is to his interest to excite interest in and promote the sale of modern cars. The demand for all devices and appliances sold to the electric railway industry is increased with the adoption of modern cars. Every salesman serving the electric railway should keep that fact constantly before him. The more new cars that are sold and the better the service that is offered the public the greater will be the demand for both new cars and new buses. Let the slogan among the manufacturers in selling transportation be: "One for all and all for one." Sell modern street cars.

Kentucky Association of Public Utilities Meets February 18-19

"CITY and Interurban Transportation" will be discussed by W. H. Sawyer, guest of honor at the tenth annual meeting of the Kentucky Association of Public Utilities, held at the Brown Hotel, Louisville, Ky., on Feb. 18 and 19. Other subjects of interest on the program are: "Twenty Years of Utility Growth in Kentucky," by Harry Reid, president National Electric Power Company, New York City; "Humanitarian Aspects of Safety," by Neil W. Funk, director of safety, Louisville Railway, Louisville, Ky., and "The Man May Pay, but Remember, It's the Woman Who Buys," by Helen E. Steiner, divisional chairman women's committee East Central Division, National Electric Light Association, Cleveland, Ohio.

Increasing Speed and Comfort by Modernization of Equipment*

BY E. A. PALMER

Westinghouse Electric & Manufacturing Company

OPERATING organizations of our electric street railway companies and equipment manufacturing organizations are devoting particular attention to those items which contribute to fast, comfortable service and thereby attract more patronage to the electric railway business.

High schedule speeds on city surface lines are a function of the rate of acceleration, free running speed and rate of braking of the rolling equipment. Quadruple equipments of high-speed motors for double-truck cars during the past four or five years have comprised about 80 per cent of the installations, being preferred to double motor equipments because of the more rapid acceleration possible. Theoretically the energy consumption is lower for two motors than for four, because larger, more efficient units are involved and the weight efficiency is higher. Maintenance of the motors should be less because only half the number are involved and a part of the maintenance expense is nearly independent of the size of the motor. However, the majority of experienced operators feel that these theoretical advantages of the two-motor equipment are overcome by the waste of energy and excess stresses caused by wheel slippage and by the superior acceleration of the four-motor car.

The low floor car has been adopted by the industry almost universally. Since the innovation of this idea in 1912 a complete line of motors up to 60 hp. has been developed for use on wheels up to 28 in. diameter. During the last three years 85 per cent of all cars for which the Westinghouse company furnished the electrical equipment had wheels of this size or smaller.

One-man operation of street cars is now an established practice. The use of one-man cars has extended steadily during the last ten years. Frequently two-man cars can be so arranged that they may be operated by one man if the occasion arises. Whether cars should be single or double end depends on whether wyes and loops are available for turning. Approximately 80 per cent of all equipment furnished over a number of years has been double end.

Considerable study is being given at the present time in some large cities to multiple-unit two-car train operation.

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*Abstract of a paper presented at a meeting of the Electric Railway Association of Equipment Men, Southern Properties, held at Memphis, Tenn., Jan. 26-28.

The permanently coupled articulated train has been very successful on some properties.

New cars must be adequately ventilated during the winter season. The majority of the men in the industry are quite satisfied with the arch roof and ventilation construction at present standard with all car builders. A heating system that will maintain a comfortable temperature is necessary. Electric heat seems to be specified on most new city cars where the winters are moderate.

A good proportion of cross seats properly spaced insures comfort. Practically all the plans of new cars specify all the cross seats possible. Safety devices interlocking the controller, line switch, doors and steps, and brakes are being used on practically all cars for one-man operation and most cars for two-man operation. Cars should be efficiently illuminated so that passengers may read without eyestrain even on rush-hour voltage. There is opportunity for the use of beautiful yet useful fixtures. The ceiling finish should reflect rather than absorb light.

New light-weight, one-man, two-man low-floor cars generally weigh less per seat than the cars replaced. The energy saving is generally in direct ratio to the reduction in weight. This is considerable where maximum demand energy contracts prevail.

Maintenance of equipment per car-mile should be less the first few years even though the new cars be kept in almost continuous service in the non-rush period of the day. The platform time savings will be very substantial if a change is made from two-man to one-man operation with the introduction of the new cars.

The Brooklyn City Railroad showed 28 per cent increase in traffic on one line with new cars and Thomas Fitzgerald, vice-president Pittsburgh Railways, advises that during recent years every time new cars replace old cars on a line the receipts increase substantially.

Without cheap and reliable electric railway transportation it would be impossible for the large business organizations in the congested sections of our cities to exist. Let us therefore all boost for the modernization of our rolling equipment.

Birney Club Discusses de Luxe Cars

LIVELY discussion of car modernization and the present-day tendency toward the inclusion of more luxurious seats and accommodations for the comfort of passengers took place at the regular monthly meeting of the Birney Club of St. Louis held on Feb. 7 at the Missouri Athletic Club. There was general agreement of the need and importance of modernizing car equipment to meet the level of present-day transportation demand. Differences of opinion were expressed as to just what steps in car design and construction are needed to fulfill this demand and to increase the popularity of street car riding.

L. F. Stoll, assistant vice-president McGraw-Hill Publishing Company, Inc., and Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, were called on for short talks by President Richards. Mr. Stoll discussed the significance of the fundamental changes taking place in the transportation industry and indicated that these changes are perhaps taking place faster than the industry itself realizes. Mr. Gordon spoke on the electric railway equipment situation and pointed out that the present widespread tendency to repaint and rebuild existing equipment is an index of the general interest being taken in car improvement. He held that this activity offers the equipment manufacturers an opportunity so to improve the performance and the ride merchandising appeal of their product as to demonstrate conclusively the desirability of replacing old equipment with new cars instead of rebuilding.

Bus Drives Compared

RELATIVE advantages of mechanical and electrical drive for buses were discussed at considerable length at the February meeting of the New England Street Railway Club held at the Copley Plaza Hotel, Boston, Feb. 3. This topic aroused much interest on the part of the members and evoked many questions. Charles Froesch, engineer Mack Trucks, Inc., reviewed the technical features embodied in the gas-electric drive and showed by means of lantern slides the latest practice in adapting this drive to the new buses now in process of development. R. E. Fielder, sales engineer Yellow Truck & Coach Manufacturing Company, spoke briefly from his experience, running back over a period of twenty years of bus operation, and said that the future is promising for electric control. He stressed, in particular, the economics of operation, based on experience with crowded thoroughfare operation of buses in places where electric drive has proved both economical and desirable. Where the traffic averages four passengers or more per bus-mile, he said that electric control has an undoubted advantage. On the other hand, both speakers were of the opinion that on long suburban runs, where few speed changes are necessary, mechanical drive is superior in certain respects.

J. C. Thirlwall, engineer General Electric Company, added to the opinions of the previous speakers by citing the experience of the Philadelphia Rapid Transit Company. Greater ease in riding, less annoyance from speed changes, more comfort in every respect are features of electric drive that attract passengers. The speaker concluded that large operating companies are inclined to turn toward electric drive almost without exception. The Boston & Maine and the New England Transportation Company were cited as local companies favoring this method of drive.

In the discussion that followed the remarks of the speakers it was brought out that the recent acceptance of $2,000,000 of equipment bonds issued for electric drive buses to be purchased on a ten-year life period is perhaps the most marked acknowledgment of the dependability and practicability of the electric drive.

Speaking at the close of the dinner, Ralph S. Bauer, Mayor of Lynn, Mass., advocated closer co-operation and stronger partnership on the part of public service companies in the solution of many problems confronting municipalities today.

New York Railroad Club February Meeting

"TRAINING Understudies for Official Positions in Railroad Service," will be the subject of discussion at the meeting of the Railroad Club on Feb. 18, to be held at the Engineering Societies Building, at 8 p.m. Prof. William J. Cunningham, who is the James J. Hill professor of transportation at Harvard University Graduate School of Business Administration, will be the principal speaker. He advocates the creation of a corps of cadets, graduates of universities and technical schools, and those without college training who have shown exceptional promise in their work. Men who graduate from the course with high standing, according to Professor Cunningham, should form the group from which one-half or more of the minor officials for the various departments should be selected.

American Association News

American Executive Committee

STANDING and special committee reports occupied the attention of the executive committee of the American Electric Railway Association at a regular meeting held in Toledo, Ohio, on Feb. 4, 1927. Members in attendance were President W. H. Sawyer, Managing Director Lucius S. Storrs, Executive Secretary J. W. Welsh, R. P. Stevens, J. H. Hanna, F. R. Coates, L. E. Lippitt, C. B. Proctor, Daniel Durie, J. V. Sullivan, E. P. Waller, B. A. Hegeman, Jr., G. A. Richardson, S. J. Cotsworth, C. R. Ellicott, H. L. Brown, E. B. Meissner, C. L. Henry and K. A. Simmon representing M. B. Lambert. Representatives of state and sectional associations present by invitation included E. T. Chapman, president of the Connecticut Company section; G. K. Jeffries, president of the Central Electric Railway Association; C. R. Phenicie, for the Wisconsin Utilities Association; A. E. Reynolds, president Mid-west Electric Railway Association; C. F. Handshy, president Illinois Electric Railway Association; J. J. Coleman, for the Pennsylvania Street Railway Association; W. V. Griffin, president Chicago Rapid Transit Company section.

In addition to routine business, Thomas Fitzgerald, chairman of the committee on the Anthony N. Brady award, outlined the conditions which have been fixed this year for judging accomplishment in the interest of safety. It was recommended that a gold medal be given to that property which had made the most outstanding accomplishment in the class operating 5,000,000 or more vehicle-miles per year. A silver medal will be given to the winning company operating between 1,000,000 and 5,000,000 vehicle-miles, and a bronze medal to the property having made the greatest contribution to safety in the class operating less than 1,000,000 miles per year. In the classification of properties for the award bus mileage is to be included with car mileage.

F. R. Coates, reporting for the committee on co-operation with state and sectional associations, recommended that the presidents of all sectional and state railway associations be made members of the American Association Executive Committee, without voting power. In the case of a combined utility association, this privilege would be extended to the chairman of the railway division or to the railway member designated by the sectional association. There was some discussion regarding the matter of membership in the American Association on the part of such sectional associations, and an alternative suggestion made that the presidents of these associations be invited to attend executive committee meetings. The matter was referred to the committee on revision of constitution and by-laws for further consideration.

H. L. Brown, chairman of the subjects and meetings committee, reported the result of a preliminary survey of the industry for opinion regarding the most valuable form of meeting and the character of subjects considered of most interest for an annual convention. Replies received indicate a preponderance of opinion in favor of comparatively short sessions with a few prominent speakers supplemented by group conferences on current operating subjects.

A preliminary report of the committee on revision of the constitution and by-laws was read by Charles Gordon, representing James H. McGraw, chairman of the sub-committee on association dues.

Since the action of this committee is contingent on the work of the policy, finance and other committees the report was principally in the nature of reporting progress and of informing the executive committee regarding the work which had been undertaken. A schedule of proposed dues was submitted for the purpose of establishing the basis on which the association's expense would be divided between companies of various sizes and classifications, the final schedule to be determined after various studies of association activity are completed.

Resolutions regarding the holding of demonstrations outside of regular exhibits, the setting aside of a day for inspection of exhibits and inspection of manufacturing plants during the annual convention, were passed. These were similar to resolutions on these matters adopted in previous years.

REPORT OF POLICY COMMITTEE

The report of the policy committee, read by Chairman R. P. Stevens, was as follows:

"Questions which have been referred to this committee for study and recommendation as to policy include the association's publishing plan, its statistical service and its Washington office.

"A recommendation was made by the publications committee that rates for advertising in *Aera* be increased. In bringing this specific question before the policy committee the president asked that a review be made of all phases of the association publishing plan with particular reference to possible co-ordination of this effort with the similar work of the business publications serving the industry.

"There was no thought that *Aera* should be done away with but that this committee should consider whether some change in its general character might better serve the interests of the association, avoid duplication and effect economy. There was also no thought that this review should in any way reflect unfavorably on the work of those who have been responsible for producing the magazine *Aera*. They have done a commendable job of carrying out the present publishing policy. The question is whether this policy should now be somewhat revised.

"After some investigation by the finance committee, the policy committee was asked to consider whether the services of the bureau of information and service might to advantage be expanded, or whether these might be somewhat curtailed in the interest of economy without serious detriment; also, whether co-ordination between the association's statistical work and that of the business press might be effected with economy and with strengthening of the facilities for securing and presenting these data. Again, this committee understands that there is no idea of doing away with the association's statistical service. The question did not arise through suggestion of dissatisfaction with the work of those in the headquarters staff assigned to this task, but only because the president has felt it wise that from time to time we should have a review of all major phases of the association work. It is only in this light that this committee understands its study is to be made.

"The finance committee has also questioned the necessity of the association continuing to retain an exclusive Washington office, as has been desirable heretofore. It was started as a war-time necessity. The policy committee was directed to give consideration to all phases of this question.

"On none of these three matters has this committee carried its study far enough to be able to make any recommendation at this time. It is desired only to report progress."

The report was signed by G. A. Richardson, C. R. Ellicott, H. L. Brown, J. P. Barnes and R. P. Stevens, chairman.

Presidents of the affiliated associations reported on the progress of their work, and visiting presidents of sectional associations expressed their desire to co-operate with the American Association.

The next meeting of the executive committee was fixed for Friday, April 1, at association headquarters in New York.

Co-operation with State and Sectional Associations

PLANS for getting better accord between the various associations occupied the members of the committee of the A.E.R.A. on co-operation with state and sectional associations held at Toledo, Ohio, on Feb. 4. Members present were F. R. Coates, chairman; R. F. Carbutt representing T. R. Langan, A. E. Reynolds, W. A. Alexander, W. V. Griffin, E. T. Chapman, C. R. Phenicie representing J. P. Pulliam, R. McGregor, C. F. Handshy, J. J. Coleman, W. W. Holden, W. R. Robertson and Charles Gordon.

Mr. Coates called on representatives of the various associations, who spoke regarding the development of some means of keeping each local association as well as the national association informed of what the others are doing.

New Association Members

FOUR operating electric railways, two manufacturers and ten individuals were elected to membership in the American Electric Railway Association at the executive committee meeting held at Toledo on Feb. 4. Following is a list of companies elected:

Alton Railway, Alton, Ill.

Illinois Power & Light Corporation, Chicago, Ill.

Jamestown Street Railway, Jamestown, N. Y.

Youngstown Municipal Railway, Youngstown, Ohio.

H. K. Ferguson Company, Cleveland.

J. D. Wallace & Company, Chicago, Ill.

Getting On with the Public

UNDER the general subject of "The Transportation Man and His Job" a meeting of the Metropolitan Section of the American Electric Railway Association, held on Feb. 4 at the Engineering Societies Building, New York City, resolved itself into a discussion of how to get on with the public. G. T. Geer, secretary Third Avenue Railway, emphasized the importance of courtesy and co-operation. He said that these come naturally to some men, but not to others. The latter, however, can at least adopt the outward form and in due time this will beget the proper spirit, he said.

Isabell Davie, secretary women's committee, Public Relations Section, National Electric Light Association, spoke about "The Woman in the Utility Field." She told how women can make themselves useful, particularly in the electric light industry.

"What the Public Thinks of the Transportation Man" was the subject of a talk by Major J. S. S. Richardson, director Public Service Information Committee of Pennsylvania. He pointed out that it does not always matter whether or not a thing is true; if the public believes it, it might as well be true so far as public relations are concerned.

The meeting was conducted under the sponsorship of a committee consisting of H. F. Merker, Brooklyn City Railroad; W. S. Keller, Third Avenue Railway; K. S. Lewis, Interborough Rapid Transit Company, and H. R. Sisson, Sisson Supply Company.

The News of the Industry

Eight Cents in St. Louis—Fares Fight Likely

Acting under a temporary restraining order issued by United States District Judge Reeves at Kansas City, Mo., forbidding the Missouri Public Service Commission or any state officer from interfering, the United Railways St. Louis, Mo., on Feb. 7 put into effect a new schedule of fares. Under the new rates adults must pay 8 cents for a single cash fare but may buy two tokens for 15 cents. The railway is giving each patron a receipt for 1 cent for each cash fare or every two tokens purchased. These receipts will be redeemed if the increase is held later to have been unjustified. Children's fare remains at 3 cents. The order issued by Judge Reeves is returnable within ten days. At that time it is probable arguments on the merits of the company's demand for the higher fare will be heard by two federal district judges and one circuit judge. Provision for this is made in the order of Judge Reeves, and this board would decide whether the higher fares should be made permanent.

In its appeal to the federal court the United Railways claimed that the valuation of its properties is $75,000,000 instead of approximately $58,000,000, allowing for additions made since 1919. In 1923 the Public Service Commission fixed the valuation of the property at $52,000,000 as of 1919. The company says that the 8-cent cash fare for adults with two tokens for 15 cents will yield it only 5.8 per cent upon the valuation of $75,000,000.

The action of the railway in applying to the federal courts for relief has been anticipated for some time. The action by the commission that forced Receiver Wells to go into the federal courts came on Feb. 4 when the commission suspended until June 7 the new schedule of fares the company had filed with the commission to take effect on Feb. 7. That forced a continuation of the 7-cent fare, under which it was claimed the railway was losing $160,000 a month.

Prior to taking its case to the federal courts the company exhausted other methods of obtaining aid from the state commission. On June 3 last, Receiver Wells, with the permission of the United States District Court in St. Louis, applied for an increase in fares, but did not state the exact amount desired. Upon the request of the city the state commission then ordered an audit of the company's books to determine whether an increase was needed. The commission then delayed until September before attempting to start the audit. In October Receiver Wells again requested the commission to grant a temporary increased fare pending the final audit. Hearings were held and again the commission took the matter under advisement. On Jan. 7 the receiver made the final move possible under the state laws, the filing of a new schedule of fares to take effect on Feb. 7 unless suspended by the state commission. The commission then suspended the new rates, contending that the company having first followed the method of applying for an increase should have awaited a decision on that application. The commission admits that its audit of the earnings of the railway will not be completed before March 1.

Ten Cents Cash in Syracuse

Review of Facts Which Led Commission to Advance Fares in Salt City—Company Earning Less than 4 Per Cent—New Rate Not Likely to Return 8 Per Cent

THE Public Service Commission on Feb. 4 authorized the New York State Railways, effective on Feb. 10, to establish new fare rates on its Syracuse Lines, ten tickets for 75 cents; single cash fare, 10 cents, the new rates to continue in effect until the commission shall otherwise order. The present cash fare is 7 cents.

While no valuation was fixed by the commission the rates were determined upon a tentative rate base of $9,426,739 as of Sept. 30, 1925. Based upon revenue passengers carried for the year ended Sept. 30, 1925, and under the new fare rates authorized, estimating a 2 per cent decrease in travel, 70 per cent of riders using tickets and 30 per cent paying cash fares, the increased revenue, based on the tentative valuation of $9,426,739, will give an estimated return of 7.58 per cent upon such value of the property used in giving service on the Syracuse Lines.

The tentative rate base established was based on a valuation by the commission in its decision on April 19, 1921, of $8,554,240 plus additions to property since that date and allowances for materials and supplies and working capital.

The order was based upon a memorandum by Chairman Prendergast, who said:

> Even on such a tentative rate base, the rate of return enjoyed by the Syracuse Lines of the petitioner during the year ended Sept. 30, 1925, was less than 4 per cent. Further, that the increased rates prayed for will likely provide a rate of return of considerably less than 8 per cent.
>
> Petitioner has failed for many years to pay dividends and has certainly exhausted every reasonable expedient in endeavoring to effect economies so as to continue operations at the rates fixed by this commission in 1921. The financial results have been at least as disappointing as those set forth in a table covering 1925 revenues and expenses.
>
> Therefore, upon this record and without a formal fixation of valuation, it is determined that the rates prayed for by petitioner will in no event be unreasonable and they should be permitted to file, to be effective as of Feb. 10, 1927, and continue thereafter until the commission shall otherwise order or direct.

Evidence showed that the actual passenger revenue for the year ended Sept. 30, 1925, was $2,254,085 and the estimated increased revenue, due to the increased fare rates, will be $346,023. This estimate took into consideration a 2 per cent decrease in the number of car riders due to increased fare.

Five valuation estimates were submitted on the hearing, as follows:

> Commission's valuation, estimated present-day costs, less observed depreciation and not including organization expense and working capital, $8,485,168.
>
> New York State Railways, estimated reproduction cost, new, no depreciation, $15,658,081, and valuation used by Public Service Commission as of Dec. 31, 1921, with net additions to Oct. 1, 1925, $9,601,534.
>
> City of Syracuse, estimated original cost, less accrued depreciation, $5,105,316, and as reported to State Tax Commission, reproduction cost, new, $9,395,447, and present value, $6,337,895.

Chairman Prendergast, in discussing the valuation figures presented, said:

> Here, as is usual in rate proceedings, there was considerable dispute and variance of opinion as to the value of the petitioner's property, the existing depreciation and the rate of return to which the petitioner may be legally entitled. In view, however, of the conclusions reached in this memorandum, it will be unnecessary, as hereinafter shown, to enter into an extended discussion of any of these questions except that of valuation.
>
> Petitioner presented a reproduction cost new, valuation of its property as of Sept. 30, 1925, and also another valuation arrived at by taking the amount determined by the commission in the last rate case and bringing it down to date by including additions to property since Dec. 31, 1921.
>
> The city of Syracuse offered exhibits showing values based on estimated cost, less depreciation, and also on reports made by petitioner to the New York State Tax Commission for 1925, to which certain amendatory and adjusting figures were applied.
>
> In addition, engineers of the commission prepared and submitted a statement of values based on present-day costs less depreciation.
>
> The city's cost less depreciation figures have certain inherent disabilities, which in our opinion, render them useless as an aid in the fixation of values. Their apparent source was Exhibit "E" in Case No. 7938, April 19, 1921. Referring to the opinion of Commissioner Kellogg in that proceeding, it appears that Exhibit "E" was in part at least based on reports made to state officials by some of the predecessor companies prior to the establishment of the Public Service Commission.
>
> We have already referred to the complex and involved corporate consolidations culminating in the establishment of petitioner. The network of relationship, together with the methods of bookkeeping pursued, and the absence of many basic records, all tend to render it well-nigh impossible to find the original costs of much of the property acquired in the earlier days of street railway operation in Syracuse. In Case No. 7938 Commissioner Kellogg found:
>
> "That it is not possible . . . . to make an accurate statement of the actual original costs of all the property" and

"For these reasons, the estimate of the city of the actual cost to the company cannot be taken . . . because there are no complete data from which such cost can be entirely computed."

The precise situation still exists as to original cost estimates. Prior to Dec. 31, 1908, there were no regulations governing the keeping of uniform accounts by electric railways and neither books nor records can now be found (nor could they be found at the time of the investigation in Case No. 7938) to show complete cost figures of the properties of the Syracuse & East Side Railway, which succeeded to the property and rights of the Syracuse, Eastwood Heights & Dewitt Railroad and in Exhibit "E" $53,000 was set forth as being its original cost. But the company had 7½ miles of track, eleven cars and a power house. Obviously its value was and is much more than the amount stated. Further, certain amounts, concededly upon the company's books and aggregating nearly $1,000,000, had to be omitted because there was no means by which they could be checked. The data with respect to other constituent electric railways was also shown to be based on incomplete records and statements of account.

In such a situation and upon such a record, it is apparent that these estimates of original cost cannot be safely made the basis of any finding of value.

Neither can city exhibit valuation—$9,395,447 or the $6,337,895—be used. It is based in part upon reports made to the State Tax Commission as of Dec. 31, 1925, with amendments and changes. Different bases of valuation for tax purposes and rate-making purposes have been uniformly recognized.

Reproduction cost, new, figures submitted by the New York State Railways as of Sept. 30, 1925, were prepared by Henry G. Throop, an appraisal engineer. He based his inventory and appraisal upon one made by McClellan & Campion and used in a former proceeding. Values were attempted to be brought down to date by the application of Oct. 1, 1925, prices and also by the use of index number percentages. After adjustments of account for retirements and additions, a total of $15,658.081 was reached. The commission said further:

> The valuation made and submitted by engineers of the commission was based on estimated present-day costs, less observed depreciation. The figure stated, $8,485,168, contained no allowance for organization, for cash working capital or for going value. If allowances be included for these items, such valuation would be upward of $9,425,000.
>
> There was also received in evidence the rate base fixed in the opinion of the commission of Sept. 21, 1922, $9.038,050. If to such base be added net additions to fixed capital, Jan. 1, 1922, to Sept. 30, 1925, of $540,565, as shown by the company's exhibit, or of $406,724 in the commission's exhibit, the rate base of Sept. 30, 1925, would be either $9,578,615 or $9,444.774.
>
> These valuations, with the exception of the commission's $8,485.168 and the company's $9.601,534, and the one referred to above, $9,578,615 or $9,444,774, are unsatisfactory and certain *indicia* of disability, which render them impossible and improper of use.
>
> In any view of the matter, if a valuation were required to be found in this proceeding, it would necessarily be in excess of $9,425,000.

Relative to the question of jurisdiction of the commission to fix fares, Chairman Prendergast says:

> The city of Syracuse argues that the commission is without authority to increase fares because of limitations affecting fares contained in franchises granted to the petitioner and its predecessors. This question was passed upon in the opinion of Commissioner Van Voorhis on Sept. 21, 1922, wherein it was stated, referring to opinion of the Public Service Commission, 2nd District, April 19, 1921:
>
> "There were no franchises granted between Jan. 1, 1875, and July 1, 1907, which limited the jurisdiction of the former Public Service Commission, Second District. (Matter of the United Traction Company vs. P. S. C. et al. App. Div. 3rd Dept., January term, 1927: and People ex rel. Garrison vs. Nixon, 229 N. Y. 575, as well as matter of Evans vs. P. S. C. 214, App Div. 122, seem authoritative, and it must be held that the commission has jurisdiction over the rates of fare in this proceeding)."

The fare was 5 cents prior to Nov. 26, 1918. It was then increased by the Public Service Commission, Second District, to 6 cents and in 1921 the Public Service Commission, Second District, authorized an 8-cent fare, four tickets for 29 cents, and a children's fare of 4 cents.

The city on Dec. 15, 1921, asked a reduction and on Oct. 1, 1922, the Public Service Commission directed a 7-cent fare.

Chairman Prendergast reviews the history of the New York State Railways, stating that that part of the system known as the Syracuse Lines involves a track mileage of about 98, of which about 74 miles is in paved streets. In 1912 the New York State Railways purchased the Syracuse Rapid Transit Railway. The latter leased and owned the East Side Traction Company and had succeeded under mortgage foreclosure to the properties and franchises of the Syracuse Street Railway and the Syracuse Consolidated Street Railway. The East Side Traction Company was the successor of the Syracuse & East Side Railway, which in turn had succeeded the Syracuse & Eastwood Heights & Dewitt Railroad. The Syracuse Street Railway was the successor of the Peoples Railroad, which had acquired all the assets of the Central City Railroad and the Syracuse & Onondaga Railway. The Syracuse Consolidated Street Railway was formed by the merger of nine street surface railroads operating horse car systems at the time of acquisition. The memorandum of the commission says that this series of mergers, consolidations and purchases becomes more than historically important because of the effect upon the original cost estimates of the petitioner's properties.

Final Arguments on "L" Lease

The Public Service Commission of Pennsylvania on Feb. 7 took under final consideration the application of the Philadelphia Rapid Transit Company and the city of Philadelphia for approval of the 30-year Frankford elevated and Bustleton surface line lease. While the city and the company made almost identical requests for approval of the lease, opponents contended the lease would work a hardship upon the city, the taxpayers and the car riders.

City Solicitor Gaffney said the lease as it is drawn is only an amendment of one approved in 1922 by the commission. Instead of the graduated plan of paying an annual percentage up to 5 until 1957, the company under the new lease will pay the fixed charges, including sinking fund, interest and state tax and an amount equal to that contemplated by the 1922 lease.

C. Oscar Beasley, appearing for the United Business Men's Association, said the car rider and taxpayer would pay for the "L" and continue to pay. Harold Evans, representing J. Henry Scattergood, a former Public Service Commissioner, who has always been an enemy to the lease, also argued against the "L" lease approval.

Decries City Attitude in Buffalo

A growing understanding among thinking people of the basic facts of the transportation situation in Buffalo, N. Y., was recently urged by Elliott C. McDougal, chairman of the Marine Trust Company, in an address decrying the attitude of the city toward the International Railway and the downtown station plan of the New York Central. It was his belief that the best results were obtainable only by cooperation and by bargains mutually beneficial. On this point he says:

> Every business man knows this by experience. He cannot quarrel with his customers; both buyer and seller must be pleased. Should the present battle continue, the city as a corporation would lose because its share of the company's receipts cannot increase those receipts increase. The company would lose even after curtailing its service to the utmost possible limit. The car riders would lose because of the curtailed service on the old lines and because of the stoppage of the opening of new lines. With present conditions all three lose; with co-operation and fair dealing all three would win.

With reference particularly to the transportation problem in the city, he said that the city was in need of good electric railway and bus service and that it was better to be served by a company financially strong than one financially weak. Continuing, he said:

> We appear to be doing everything that we can to weaken the present company and to compel it to spend, in defending itself against unwise legislation, money that would much better be spent on track, pavements and service.

Another Subway Plan Suggested for Providence

Expenditure of the sum of $17,000,000 would furnish Providence, R. I., with a system of equipped subways which would eliminate all surface cars from the business section of Providence and provide a safer, speedier and more comfortable means of travel at an increase of 1 cent in the present fare rates. This was the opinion expressed by William M. Lewis, assistant engineer in the Boston Transit Department, at a meeting of the Providence Engineering Society recently.

Mr. Lewis was associated with the building of the Tremont Street subway at Boston in 1894. He is the second speaker to discuss traffic problems of Providence at the Engineering Society during the last two months, the previous authority being Robert H. Whitten, city planning consultant. Mr. Lewis stated, however, that his subway proposition was not suggested to displace the Whitten plan, but was to be used in conjunction with it.

The plan as outlined by Mr. Lewis would provide for two subways, each running through Exchange Place, where a transfer station would be built. They would be laid with double tracks, would accommodate all traffic brought into the down-town district by electric cars, with two exceptions. In commenting on the change that would be wrought in traffic conditions by the removal of surface cars in the business section of Providence, Mr. Lewis held up Exchange Place as an example. By nature, he said, Exchange Place was a beautiful square, but now it was little more than a railroad yard most of the time.

Paving Relief Measure Introduced in New Jersey

In a modified form there has been introduced in the Legislature of New Jersey by Senator Abell of Morris County the bill to relieve the electric railways of the obligation to pave between tracks. Last year's bill failed to pass over Governor Moore's veto. It provided that the company be relieved of the entire cost of this paving. Senator Abell has explained his bill as follows:

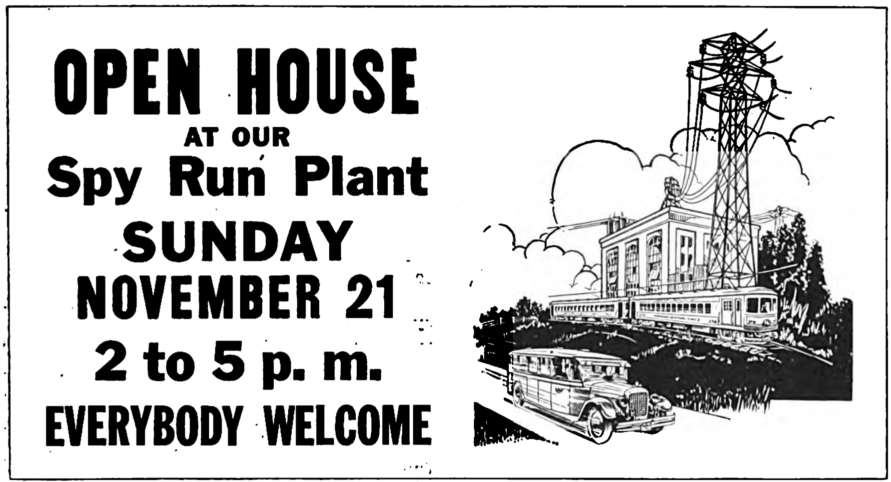
> The purpose of this bill is not to relieve railways of all paving obligations but rather to readjust those obligations so as to bring them into harmony with modern economic conditions and make them uniform throughout the state. Under this bill such companies at their own expense will have to restore all pavements they may disturb in connection with trackwork and in addition will be obligated to repair at their own expense damage heretofore or hereafter done to streets.

Fort Wayne Company at Home to Public

Proud of the completion of its construction program for the year, the Indiana Service Corporation, Fort Wayne, Ind., decided recently that it would be a good plan to exhibit the whole plant to the public. This it did on Nov. 21 between the hours of 2 and 5 p.m. The response on the part of the public was most gratifying. To the end that the tour might be conducted to its own best advantage and the best advantage of the public, the company had about fifteen platform men in uniform act as directors of traffic or guides. In addition other men were in attendance from different departments to answer questions and to direct the public once they were inside the building. As an extra precaution the company strung ropes around certain places, notably in the power houses and to some extent around the car pits in the shop, so as to minimize the element of danger that adheres in all such plants.

In anticipation of the event, the company advertised its invitation to the public to inspect the property, in the newspapers and with car cards. It is, of course, the regular practice of the company to display car cards in all its city cars to advertise its own business and to call attention to civic events of importance. These cards are changed weekly. One of them, in which the text and the illustration have been placed side by side merely for convenience of reproduction, is shown in the accompanying illustration. In addition to this, the company issued a pamphlet to every one who visited the plant. This was a 24-page publication, 5 x 8 in., on tinted paper describing the activities of the company. In addition to this each visitor to the plant was presented with a small souvenir in the form of a holder in which to carry the weekly pass.

As to the work which was done during the year, the company moved into its new shops, which have been described previously in the ELECTRIC RAILWAY JOURNAL, and did a very large amount of remodeling of small buildings to take care of bus repairs. Added to all this the company built a cyclone fence around the whole Spy Run yard and improved the appearance of the surroundings by sodding the grounds close to the buildings and otherwise improving the landscape. In addition a building was put up for storage in connection with the power house. This is called the pipe storage building.



OPEN HOUSE
AT OUR
Spy Run Plant
SUNDAY
NOVEMBER 21
2 to 5 p. m.
EVERYBODY WELCOME

Car Card Used by the Indiana Service Corporation to Invite the Public to Visit Its Plant

Chicago Street Traffic Article Reprinted

SEVERAL requests have been received for additional copies of the article entitled "Street Traffic Analyzed in Chicago," appearing in the ELECTRIC RAILWAY JOURNAL for Jan. 8, 1926. The JOURNAL has therefore had a limited number of reprints made and these are available in lots of 50 or more at 10 cents a copy.

Reorganization of New York Commissions Unlikely

Governor Smith of New York has practically abandoned his plan for reorganization of the Public Service Commission and the Transit Commission. When he was asked if he intended to appoint a successor to Commissioner Van Voorhees, whose term is about to expire, the Governor said he expected to do so.

The Governor's proposal to the legislative reorganization commission was in effect to separate the transit commission of New York and the up-state commission, which were consolidated by the reorganization laws, and not appoint a successor to Mr. Van Voorhees, so that there would be three members on each commission.

Wheeling Weekly Passes Made More Popular

As of Jan. 10 the Wheeling Traction Company, Wheeling, W. Va., made an immediate and large increase in sales of its weekly passes through certain consolidations and reductions. From a total of nineteen varieties, eighteen of which were in use since May 3, 1926, there are now eleven, although only three were eliminated.

In the new line-up, the $1 Wheeling and $1.25 Greater Wheeling passes have been merged into a single $1 Greater Wheeling pass. The $1 Brookside and $1.25 Martin's Ferry passes were merged into a $1 pass. The $1.50 McMechen and $1.75 Ohio passes were merged to a $1.50 pass called McBell, as it includes both McMechen and Bellaire. The $3 Moundsville and $3 Ohio Terminals passes were merged into a $3 pass. The $2 Linwood pass was cut to $1.75. The $2.50 Wellsburg, $2 Briliant and $1 Mingo passes were eliminated.

The McBell and Moundsville-Ohio Terminals consolidations greatly stimulate riding between the West Virginia and Ohio portions of the property, while the new Greater Wheeling pass makes one pass good for Wheeling and its immediate suburbs.

Attack on Indiana Commission

A new attack on the Indiana Public Service Commission is probable in the state House of Representatives. Two representatives have prepared a measure identical to the Cann Senate bill to abolish the commission and restore utility regulation to the agencies that existed before the law was enacted.

In all, five bills dealing with the commission are pending in the Indiana Senate. Their provisions range from complete abolition of the body to removal of municipally owned utilities from commission control.

Rules Off Obtrusive Fenders in St. Louis

Projecting fenders of the cars of the United Railways, St. Louis, Mo., must be discarded within 60 days, the Missouri Public Service Commission ruled on Feb. 1. The ruling follows a complaint filed by the St. Louis Safety Council that the projecting fender is a menace. Company officials also favored the substitution of safety devices of the type now in use in many other cities, but a city ordinance requires the use of the overhanging type of fender and a ruling from the state commission for their removal was necessary. Evidence showed that this type of fender had been abandoned in many other cities.

Fare Increase Sought in Utah

The Bamberger Electric Railroad has applied to the Utah Public Utilities Commission for a 10 per cent increase in rates of its first class one-way and round-trip fares between Ogden and Salt Lake City and intermediate points. The application declares that the one-way fare now charged between the points named is based on a charge of approximately 2¾ cents per mile, with a minimum fare of 15 cents, and that the round-trip fares are based on a charge of 180 per cent of the one-way fare, with a minimum of 25 cents. It is pointed out that the Denver & Rio Grande Western Railroad first class one-way and round-trip fares between Salt Lake City and Ogden and intermediate points are based on a charge of approximately 3.6 cents per mile. For more than six years past the revenue from passenger travel on the Bamberger has shown a yearly decrease of $35,000, or a total of $214,039, and that in order to enable the petitioner to continue to give the public adequate and efficient service additional revenue must be obtained.

The application also states that in the event the request is granted for increased fares the road will resume operation of bus service between Salt Lake City and Ogden and intermediate points in co-ordination with the other service. It also states that, providing the increase is allowed, the fares will be applicable to bus lines also. Under the proposed increase, the first class one-way fares will be based on a charge of 3 cents per mile, with a minimum fare of 20 cents, and the first class round-trip fares will be based on a charge of 180 per cent of the proposed first class one-way fares, with a minimum fare of 30 cents.

Pittsburgh Railways Officials Entertain Former Employees

There gathered in Pittsburgh, Pa., on Feb. 2 a group of men, all former Pittsburgh Railways employees, who are eminently successful in electric railway affairs. These guests of the railway included J. H. Alexander, B. J. Yungbluth, G. C. Hecker and J. W. Welsh. The *Sun* thus summarized their careers:

> Mr. Alexander started work for the Pittsburgh Railways in 1910 at $85 a month. He was a colonel in the United States army for two years during the war and now is president of the Cleveland Railway.
>
> Mr. Yungbluth commenced his railway experience as a $15-a-month oil room employee of a Mexican railroad and shortly afterward came to the Pittsburgh Railways, where he remained ten years. Today he is president of the International Railway, Buffalo.
>
> Mr. Hecker worked nights for the Pittsburgh Railways in 1910 in the load dispatcher's office and attended classes at Carnegie Tech. From 1912 to 1917 he was chief electrician for the company at Pittsburgh, later becoming electrical engineer. Now he is special engineer for the American Electric Railway Association at New York.
>
> Mr. Welsh worked in 1906 as car tester at the Homewood carhouse. In 1918 he was electrical engineer and traffic manager for the Pittsburgh company. He came back today for a visit as executive secretary of the American Electric Railway Association at New York.

A. W. Robertson, president of the Pittsburgh Railways, entertained the group.

Reunion at Pittsburgh Brings Former Employees Together

Schenectady Railway Seeks Rehearing

The Schenectady Railway, Schenectady, N. Y., filed a petition on Feb. 1 with the Public Service Commission for a rehearing of the proceedings before the commission on the application of Bohl Brothers and John Coons for the transfer of certificate for the operation of a bus line between Schenectady and the hamlet of Guilderland. At the first hearing in this proceeding, the railway advised the commission it had no objection to the transfer. Subsequently Bohl Brothers operated the line as a through route from Schenectady to Albany, they already having acquired the right of D. C. Main to operate between Albany and Guilderland. To this method of operation, the Schenectady Railway objected.

The appeal for rehearing refers to the order of the commission denying a certificate to David W. Jeram and David W. Jeram, Jr., for operation of a through bus line between Albany and Schenectady on the ground that the Schenectady Railway and the New York Central Railroad were rendering adequate service.

Concern in San Francisco

A steadily growing deficit in the San Francisco Municipal Railway, San Francisco, Cal., due to falling receipts and increased expenses has greatly alarmed city officials, who recently voted the platform men a raise in pay. Practically all the officials are in favor of the men getting a $6 a day wage, but many of them are wondering where the money is coming from if the 5-cent fare is to be maintained and the tax rate not raised.

It has been estimated that receipts have fallen off approximately $100,000 and that operating expenses have been increased $182,000, due chiefly to increases in pay granted the men since last May.

According to the books of John Hannan, accountant for the Board of Public Works, the actual deficit of the operation of the lines from May 1 to Nov. 30 was $38,000. But added expenses went into effect the first of the year and now officials are unable to predict just what the deficit will be by June 30.

Many causes are cited for the falling off in revenue—automobile competition, the fact that some lines operate in undeveloped territory which has not been fully settled and from which no great increase in revenue can be expected, and several others.

A 40-cent raise in daily pay was granted the men last May, when city officials fixed $3,500,000 as about the amount of revenue that would be taken in by Dec. 1. The actual receipts, however, proved to be only $3,101,346. It is not believed that the December receipts were more than $300,000, which leaves a discrepancy of about $100,000.

Late in December a second raise of 20 cents a day was voted for platform men.

Accountant Hannan declares that either an increase in fares or a resort to the tax rate for funds is the only way out of the dilemma.

Edward Van Deleur, president of the carmen's union, said:

> If the supervisors will give the railway system credit for what it earns, I believe it will take care of most of the increases in pay.
>
> By this I mean the interest on the daily balances of Municipal Railway funds should be credited to the railway account. The money now goes into the general fund and is used like other funds.
>
> There is $80,000 still due the municipal funds from money borrowed to pay the shortage in the cost of the Twin Peaks and Stockton Street tunnels.
>
> There is $125,000 in an old compensation insurance fund that we believe should be made available for the payment of our increases.
>
> Then there is the $200,000 of the earnings of the road that go each year to the retirement of bonds. No other road is ever expected to pay off the original investment. If these items are placed to the credit of funds necessary to meet the increases granted us there will never be any need to raise the fares.

T. A. Reardon, president of the Board of Works, in justifying the second raise granted the carmen said:

> The street car men all started off on a $3 a day basis. During the war the car repairers and others got increases which were refused the platform men owing to their numbers. We have been trying to equalize them. Mayor Rolph is insistent that the platform men have the greatest amount of responsibility and should receive as much as the others. When the supervisors raised the car repairers and provided $50,000 we also raised the platform men.

Franchise Negotiations in Canton

Canton, Ohio, is now in the throes of a transportation problem. The Northern Ohio Power & Light Company, the local operator of railway service, will not consider continued operation unless the company is given the entire transportation privilege. A. C. Blinn, general manager of the company, has made it plain at all times to the City Council committee that the company was willing to quit if the Council could get some other responsible concern to take over the business and supply satisfactory service for less money. He said that whoever undertook the job should have all the business. There are thirteen independent, competing bus lines in the city.

The problem presented itself in Canton about a year ago when Mr. Blinn went there and in a conference with the Council suggested that it might be well to take up the question of the new franchise contract in view of the expiration of the old one in February, 1928. This conference led to the employment of the Beeler Organization by the city. Mr. Beeler and his assistants made a survey and filed a report suggesting a co-ordinated bus and rail system. The report provided for retaining the main car line arteries and for bus feeders.

Since the filing of the report, Mr. Blinn has had two or three conferences with the city relative to some plan for the continuation of service. The Chamber of Commerce and other organizations in the city do not want the car lines removed, but Mr. Blinn said that it was perfectly satisfactory to the company if the city could find some responsible concern to take over the city system. The city is not inclined to give the contract to any other company, but it has not indicated that it is willing to give the Northern Ohio exclusive operating rights.

The present fare is 6 cents with six tickets for 35 cents. There has been no discussion of future fares while negotiations are still in progress.

Service News, the official paper of the Northern Ohio Power & Light Company, compares the situation in Canton with that in Akron, solved a few years ago by the co-ordinated systems supplied by the Northern Ohio Power & Light Company.

$4,500,000 Railway Budget for New Jersey Company

Upward of $57,000,000 is available this year for new construction, extensions and improvements by the Public Service Corporation of New Jersey in the territory which that company serves. Of this sum $31,064,381 was authorized in the 1927 budget, the other $26,000,000 having been authorized in previous budgets and covers work now in progress. The electric operating department's portion of this year's budget is $25,461,578, of which sum about $2,500,000 will be used for the installation of the fifth unit of boilers, consisting of three of 2,360 hp. each, for the Kearny generation station. There are twelve boilers at the station now and the extra three will provide for the maximum output planned for the first unit of the plant.

The railway and bus transportation companies will spend about $4,500,000 for upkeep of properties, additions and alterations to plant and equipment. The largest item authorized is an appropriation for the purchase of about 200 new buses, contracts for which have not yet been awarded. The railway will spend approximately $1,500,000 for track reconstruction in various parts of the state and 450 new electric fare boxes will be bought for the transportation company.

Safety First in Booklet for Children

School boys and girls in Milwaukee, Wis., are being taught through a 32-page booklet that health, helpfulness and happiness are dependent, in a large measure, on safety first rules and their practice. The booklet, called "Safe at Play with Ned and May," has been prepared in the hope that it may show the children the way in which to avoid dangers of present-day traffic. While playing ball, the game of chase, coasting or roller skating, Ned and May and others learn how to play with safety. The booklet is replete with rhymes such as:

> M is for Mindful
> Of danger around,
> So always be careful
> Wherever you're bound.

The booklet concludes with a safety song, the last verse of which says:

> Now our song is ended,
> And if you are wise
> You'll make a pledge to safety
> And use your ears and eyes.

News Notes

Back to Five-Cent Fare.—The Public Service Commission of Kansas recently approved the return by the Union Traction Company of the 5-cent fare at Coffeyville. Application for such permission was made by Receiver Layng. About a year ago the rate was boosted to 8 cents, but the revenues of the company did not increase with the increased fares.

Twenty-five Cents in Conscience Fund.—Following Mel Trotter's spiritual meetings in Grand Rapids, Mich., the so-called conscience fund of the Grand Rapids Railway was increased by 25 cents. This amount came from a woman who wrote that she had ridden at one time on the cars without paying. Her decision was to pay the amount with interest. L. J. DeLamarter, vice-president and general manager of the railway, publicly acknowledged the amount with thanks.

Through Service Contemplated. — Negotiations are under way between the Milwaukee Electric Railway & Light Company and the City Council of West Allis, Wis., looking toward the establishment of a rapid transit line between West Allis and Milwaukee, together with the introduction of co-ordinated cross-town bus line service which would connect with the railway lines of the north and south sections of the city. The high-speed line project would give through transportation service with no stops once the car left the Milwaukee or West Allis city limits. This change would cut the running time considerably between the two cities. Under cross-town bus line service, the present time-consuming circuitous route between downtown Milwaukee and West Allis would be eliminated.

Engineer Opposes Shorter Headway. —A public hearing was held before the New York Transit Commission on Feb. 8, 1927, on the petition of Jamaica Central Railways, Inc., to modify the commission's order requiring a ten-minute headway on the Jamaica-Far Rockaway route. Ira W. Fisk of Fisk & Roberts testified as the company's consulting engineer to the impossibility of operating the ten-minute headway with existing sidings and introduced traffic analyses showing that present service was more than ample. The commission reserved decision.

West Penn Adds Another Weekly Pass.—The West Penn Railways on Jan. 17, 1927, installed the weekly pass at Uniontown, Pa. The pass sells for $1, against a cash fare of 8 cents and a ticket fare of 6¼ cents. This makes the third installation of local city weekly passes along the West Penn system. The first was put on at Connellsville on June 1, 1925 and the second at Greensburg on March 1, 1926. Weekly and Sunday passes have also been used for several years at other points of the West Penn and subsidiary railways, including a zone-pass installation between Kittanning and Ford City since Sept. 20, 1925.

New Rates in Fort Worth.—The City Council of Fort Worth, Tex., recently authorized the Northern Texas Traction Company to put into effect a new schedule of fare rates. This includes a 10-cent adult cash fare, three tokens for 25 cents and a weekly ticket for 40 cents plus 5 cents for each ride. Children, entitled to half fare, will ride for 5 cents and school children may purchase six tokens for 25 cents. The old cash fare in Fort Worth was 7 cents for adult cash passengers. In its application for a revision of its rates, the company explained that it was earning a net return on its investment of less than 2 per cent and that new money could not be secured with that meager showing of earnings.

New Contract Between Two Boston Companies.—An operating agreement has been entered into between the Eastern Massachusetts Street Railway and the Boston Elevated Railway, Boston, Mass., governing the use of the lines between Maverick Square in East Boston and Revere Beach. It provides for the operation of Eastern Massachusetts cars over the Boston Elevated rails into Maverick Square and by Eastern Massachusetts crews. The fare is to be 15 cents between that terminal and Revere Beach, and of this amount the Elevated is to have 10 cents and the Eastern Massachusetts 5 cents, but this fare carries with it a free transfer privilege to all the other sections of the Boston Elevated. So that these cars shall not take any of the exclusively Elevated company business, they are to operate without stops between Gladstone Street and Maverick Square.

Recent Bus Developments

Status of Purple Swan to Be Determined

Whether the United States District Court for the Eastern District of Missouri or the St. Louis Circuit Court shall determine the question of appointment of a receiver for the Purple Swan Safety Coach Lines will be determined by the federal court after a transcript of the record of the Circuit Court in the litigation involving the company's finances is filed. The transcript is now being prepared for the federal court. In the meantime the temporary receivership, which resulted from a suit filed against the company by the Seiberling Rubber Company of Akron, Ohio, has been lifted and the lines have continued operation under their own management.

The question of whether a permanent receiver for the company should be appointed was set for hearing on Jan. 6, but prior to that date the bus company filed a motion for removal of the case to the federal court. As a result the hearing of Jan. 6 was continued indefinitely. Recently Circuit Judge Hartman ruled against the petition for removal for transfer to the federal court. Following his ruling on this point the bus company ordered a transcript of the record in the proceedings so that the federal court can pass on the same question.

Officials of the bus company have denied that there is any occasion for the appointment of a permanent receiver for the company, saying that the lines have been successfully managed and are in good shape financially. They want the question passed on by the federal court because of the diversity of citizenship involved.

Some of the Purple Swan lines were operated in competition with the Blue Goose line, run by the East St. Louis & Suburban Railway.

Buses in Hudson

The Public Service Commission on Feb. 3 granted the petition of the Eastern New York Utilities Corporation (formerly the Albany Southern Railroad) and the Eastern New York Transportation Corporation for the abandonment of its railway lines in the city of Hudson and substitution of bus service thereon. A certificate was also granted for the operation of bus lines in Hudson and the town of Greenport and authorization was given for the issuance of $25,000 capital stock for the transportation company and its acquisition by the utilities company. Commissioner Lunn's memorandum accompanying the order said that the substitution of buses appeared to be a solution of an unfortunate situation and would enable the railway to discontinue a portion of its system that has for a number of years failed to meet operating expenses and at the same time furnish a service acceptable to the people of Hudson. At the hearing an exhibit was introduced showing that the local lines in the city of Hudson during 1926 earned $20,500 gross with total expenses of $28,693.

Washington-Annapolis Service Planned

The Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, Md., plans to start a bus service between Washington and Annapolis within the next few weeks. The service will be in addition to the rail service now in operation. Permission to establish the bus line has been granted by the Public Utilities Commission of the District of Columbia and the Maryland Public Service Commission. Three buses will be ordered, all of them of the latest de luxe type. At first it is planned to make three round trips daily from both cities, but officials of the company said that if necessary the number of trips will be increased. The service will be over the new National Defense Highway, which is nearing completion, and will provide bus transportation between all points along the thoroughfare.

Would Run Buses in Scarsdale

The Westchester Street Transportation Company, Inc., subsidiary of the Third Avenue Railway, New York, N. Y., on Feb. 3 petitioned the Public Service Commission for permission to operate buses on a portion of its route in the village of Scarsdale, Westchester County. This company operates the railway lines in White Plains and Scarsdale. On Oct. 18, 1926, White Plains consented to the substitution of bus service for street cars in that city for a period of five years and on Dec. 9, 1926, the commission granted an order approving the substitution. On Dec. 28, 1926, Scarsdale also granted similar consent, which the company now submits to the commission for approval.

The petition says that the proposed bus route and bus route of the Eastchester Transportation Company, another subsidiary, connect with each other at the dividing line of Scarsdale and the town of Eastchester. An arrangement has been made for through operation from White Plains and Scarsdale through the town of Eastchester, Tuckahoe and Winter Hill to Yonkers Avenue between Main Street and Bronx River. A public hearing will be held on the application.

Bill to Permit New York City to Fix Bus Fares

Under the provisions of a bill introduced in the Assembly on Feb. 2 by Emory F. Dyckman, Republican, of Brooklyn, a new section 68 is added to the transportation corporations law, providing when New York City consents to operation of bus lines for not exceeding ten years, including all renewals or extensions, such local authorities and person or corporation receiving such consent may, by agreement, fix rates of fare to be charged. The object of this measure is believed to be to overcome the provisions of a gratuitous opinion recently written by former Justice Hughes that even if a city entered into a contract with a transportation company on the matter of the fare to be charged the carrier could later appeal to the utility commissions for relief if it found the original fare condition to be onerous.

Detroit Mayor After Competing Buses

In an attack on buses which compete with the municipal service of Detroit, Mich., made by Mayor John W. Smith while speaking before city officials and members of the Grand River-Redford federation, the Mayor invited the City Council to oust the Detroit Motorbus Company from Detroit streets by abrogation of the day-to-day agreement under which it operates.

In reply to statements made by one of the Councilmen to the effect that the Department of Street Railways should use buses only as feeders for its street cars, and that paralleling of street cars and city bus service was unwise, the Mayor cited that the Detroit Motorbus Company was operating on a day-to-day agreement, which was entered into with the Common Council and stated that he would like to see "some big red-blooded friend of the people in the Council move to have that agreement abrogated." The Mayor further pointed out that privately owned buses and jitneys were running beside the city street cars, and furthermore, they were allowed to charge a 10-cent fare. Referring to the Street Railway Department, the Mayor pointed out that the department was giving fine service, that it paid its employees the highest wages in the country, and that for 7 cents a passenger might ride 37 miles. The Detroit Municipal Railway was meeting its financial obligations, including payments on the purchase contract for the system.

Accepting the Mayor's challenge to abrogate the agreement with the Detroit Motorbus Company, the City Council unanimously adopted a resolution asking the Mayor and the Street Railway Commission for information as to the negotiations being carried on between the city and the bus company. In introducing the resolution, one of the Councilmen expressed the opinion that it was for the Mayor and his Street Railway Commission to decide and inform the Council whether the day-to-day agreement with the Detroit Motorbus Company should be discontinued.

A later announcement attributed to Mayor Smith was to the effect that he was not advocating at this time the removal of the buses operated by the private bus company. Also, that the Councilmen were just as much a part of the city administration as was the Mayor's office, and had as much to do with the operation of buses of the private company on the streets as had the executive end of the government.

Would Run Two Lines.—The County Transportation Company, Inc., Port Chester, N. Y., filed a petition on Jan. 31 with the Public Service Commission for a certificate for the operation of two bus lines in Mamaroneck, N. Y. The petition alleges that the New York & Stamford Railway intends to acquire all of the capital stock of the company and that the New York, Westchester & Boston Railway is committed to the financing of requirements of the County Transportation Company, Inc.

Reports on Bus Situation.—E. R. Baker, accountant in the public utilities department of St. Paul, Minn., has presented a report of 150 pages on the bus and taxicab situation in the city to the bus committee of the City Council. Data are to be employed as a basis for recommendations for the Council on bus and taxicab routes and fares. The report includes data on the history of the newest subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., as affecting St. Paul, a corporation which has taken over most of the taxicabs in the two cities, in Duluth and in Rochester, Minn.

Bill Would Increase Gasoline Tax.—On the ground that it now costs the state of Wisconsin about $550,000 to collect $9,000,000 in license fees, whereas it costs only about $10,000 to collect the $5,000,000 obtained in gasoline taxes, a bill is being prepared for presentation to the Legislature providing for an increase in gasoline tax from 2 to 5 cents. With the 5-cent tax a law, the registration fee would be reduced to $1 and the personal property tax abolished. Electric railway and independent bus operators are now paying the 2-cent tax.

New Bus Schedule in Effect.—The Illinois Traction System on Jan. 16 put into service a new schedule on its bus line between Edwardsville, Ill., and St. Louis, Mo. Several buses have been eliminated. The new schedule is as follows: Edwardsville to St. Louis, 8 a.m., 10: 50 a.m., 4: 50 p.m., 7: 30 p.m. and 10:50 p.m. St. Louis to Edwardsville, 6: 45 a.m., 12: 15 p.m., 3: 30 p.m., 6: 05 p.m. and 9: 30 p.m.

Transfers on "Beauty Specials."—To allow students of the Girls' High School at Atlanta who live in the territory served by the Morningside and Virginia-Highland coach routes of the Georgia Railway & Power Company to use the "Beauty Special" coaches, as the special coaches to and from the Girls' High School are called, transfers are being issued on all of the regular coaches which are accepted on the "Beauty Specials." Transfers are also being issued from the specials to the regular coaches. The plan was started with the recent reopening of school for the spring term. Already it has proved very popular with the students. The "Beauty Specials," which were started when the Girls' High School opened for the current year, have proved a good supplement to the regular railway service. The schedules are arranged so that the buses arrive at the high school just before opening time and leave shortly after closing. The coaches have proved a great convenience to students.

Financial and Corporate

Net Income of Texas Electric Decreases

The gross earnings from operation on the Texas Electric Railway, Dallas, Tex., for the year ended Dec. 31, 1926, were $2,036,859, compared with $2,362,114 for 1925. The gross earnings were made up from the following principal items:

Passenger transportation	$1,692,142
Mail	26,827
Express	258,279
Rents of tracks and terminals	32,005
Rents of buildings and other property	14,395
Miscellaneous	13,209

Operating expenses and taxes for the year totaled $1,360,118, compared with $1,524,615 for 1925. Included in this decrease is an allowance of $15,000 made to the company by the Texas Power & Light Company upon power bills for the last half of the year. The item of taxes included in the above figures was $99,725 for the year, compared with $122,123 for the preceding year. The net income for the year was $250,769, compared with $411,763 for the year of 1925. These facts are contained in the annual report to the stockholders for the year ended Dec. 31, 1926.

INCOME ACCOUNT OF THE TEXAS ELECTRIC RAILWAY FOR YEAR ENDED DEC. 31, 1926, AND SUMMARY OF SURPLUS ACCOUNT

INCOME ACCOUNT		
Gross earnings from operations		$2,036,859
Operating expenses and taxes		1,360,118
Net earnings from operations		$676,740
Add-Interest on bank balances		1,853
Total net earnings before depreciation		$678,594
Interest deductions		427,825
Surplus net income before depreciation		$250,769
SUMMARY OF SURPLUS ACCOUNT		
Balance Jan. 1, 1926, per previous report		$1,354,614
Add: Surplus net income before depreciation for the year ended Dec. 31, 1926, as above	$250,769	
Less—Provision for depreciation (retirements)	100,000	
	$150,769	
Sundry direct items—		
Discount on Texas Traction Company bonds purchased doe sinking fund	$13,688	
Less—accrued rent for express terminal charged off	4,875	$159,583
	$8,813	$1,514,197
Deduct:		
Dividends declared on first preferred stock		29,957
Surplus balance, Dec. 31, 1926, per balance sheet		$1,484,240

Despite declining receipts and the necessity for the most rigid economy, the physical condition of the property was well maintained during the year. Under its mortgage the company is required to spend annually 15 per cent of its gross revenue for the maintenance of roadway and equipment. During the year expenses for these purposes were $351,950, or $46,421 in excess of the mortgage requirement. The company spent for additions, renewals and improvements to its property the sum of $95,477, including construction work and renewals of poles and cars. There was taken out of property value the price of $1,000 for certain lots sold and the sum of $1,368, representing certain railway construction abandoned in the city of Sherman.

Changes have occurred in the securities of the company during the year as follows: The outstanding underlying Texas Traction Company 5 per cent sinking fund bonds were reduced by the amount of $93,000 by the purchase of that amount through sinking fund accumulations; the company has now outstanding 6 per cent gold debentures to the amount of $1,348,000, a reduction of $2,000, representing an exchange during the year of debentures for first preferred stock; this exchange increased the amount of outstanding first preferred stock to $1,712,000; Texas Traction Company bonds in the amount of $4,000, par, held by the trustee of Texas Electric Railway mortgage and pledged under that mortgage were sold to the sinking fund of the Texas Traction Company; second preferred stock of the company in the par amount of $47,000, heretofore sold by the company to employees, has been repurchased by the company.

During 1926, the company discontinued railway service at McKinney and upon Mulberry Street in Sherman because the receipts therefrom were insufficient to provide for the service given.

Bus competition continued throughout the year upon substantially the same basis as it was at the close of the preceding year. The company experienced competition of this kind paralleling its lines between Dallas and McKinney, a distance of 32 miles, and between Waco and Hillsboro, a distance of 33 miles. The fare charged by bus service between Waco and Hillsboro is the same as the fare by interurban. Between Dallas and McKinney the bus fare during the year was advanced from 50 cents to 75 cents, while the interurban fare between these two points has been maintained at $1.

The address to the stockholders by Jack Beall, president, made a plea for legislation exempting interurban and street railways from a tax upon their gross receipts, legislation, calling for regulation of truck and bus operation and legislation requiring automobiles to stop before going over the railway crossings.

The report also estimated cash requirements for 1927, which, without considering the floating indebtedness of approximately $164,000, totals $1,871,718. This includes operating expenses, of $1,230,000; taxes, $100,000; interest, $409,855; sinking fund requirements, $81,550; payment of Denison & Sherman Railway bonds due July 1, $50,313. In addition it includes approximately $100,000, required during the year to take care of renewals and replacements and for new construction. In other words, there will be required during the year to pay operating and other necessary expenses and charges, including renewals and replacements and improvements, approximately $1,971,718. For the company to meet these charges and to enter 1928 free of floating indebtedness about $2,135,718 will be required, whereas the gross receipts for the year were $2,036,859.

California Railways Hit by Tax Ruling

Unless a tax decision rendered in Sacramento, Cal., on Jan. 27 by Superior Judge Peter J. Shields is upset by appeal, many electric railways in California may be seriously embarrassed. Judge Shields held that the separate class taxation is unconstitutional and ruled that all steam and electric lines should pay the 7 per cent rate. The decision was the result of a suit brought by the Southern Pacific on behalf of some of its electric lines to reduce the state tax rate for those lines. Under the King bill, which has been a law since 1921, electric lines have been assessed at the rate of 5¼ per cent, while steam lines and former steam lines have been assessed 7 per cent. The Southern Pacific in its suit sought to put its electric lines, which were formerly steam lines, under the lower tax rate.

The back taxes due the state under this decision amount to more that $2,500,000. A meeting of electric railroad men from all parts of California was held in San Francisco on Jan. 31 and a committee was appointed to study the situation and report at a future date.

Valuation of Capital Traction Cut

The valuation of the Capital Traction Company, Washington, D. C., for rate purposes was fixed at $25,756,880 by a decision of the District Court of Appeals rendered on Feb. 7. The appellate tribunal, through Chief Justice Martin, modified the decision of Justice Hoehling of the District Supreme Court by disallowing a claim of the company for $5,150,000, for the purchase price of the franchises and good will of the old Washington & Georgetown Railroad by the Rock Creek Railway, from which merger the Capital Traction Company was created in 1895. Justice Hoehling had sustained the claim of the company and had fixed a total valuation of $30,906,880.

The Public Utilities Commission had noted an appeal from the decision of Justice Hoehling and contested the allowance of the $5,150,000, which the commission had refused to consider when, in September, 1919, the commission reported its finding fixing the company's valuation as of June 30, 1919, at $14,270,495. This valuation was based on the normal prices as of July 1, 1914.

In disallowing this amount Chief Justice Martin declared it was a speculative price paid for the stocks and bonds of the company and should not have been paid for the franchise and good will of that corporation any more than should payment have been made to the holders of the securities of the Rock Creek Railway for its good will and franchises. The court declared it made no charge of bad faith respecting the merger, but pointed out that $8,000,000 was paid for the outstanding bonds of an issue of $4,000,000, three-fourths of which were redeemable within four years and one-half of the remainder in less than eight years thereafter.

Taking up the claim of the commission that Justice Hoehling had not provided any deduction for depreciation, which the experts for the commission had estimated at $2,000,000, the appellate tribunal adopted the decision of Justice Hoehling that no depreciation figures be set. The court ordered the commission and its successors in office to modify forthwith its former valuation and order in accordance with the decision of the appellate tribunal.

George E. Hamilton and G. Thomas Dunlap, counsel for the Capital Traction Company, announced they would take an appeal to the Supreme Court of the United States.

Receiver Appointed for Cincinnati-Portsmouth Road

The Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio, was placed in the hands of L. E. Woster as receiver when Judge Struble acted upon a suit brought by the Union Trust Company, holder of the trust indenture and first mortgage given by the company when it issued $1,000,000 in 5 per cent bonds. Mr. Woster is superintendent of transportation of the company.

J. P. Longon, attorney for the Union Trust Company, alleged in the suit that the railroad had failed to meet installments of interest, aggregating a large sum, due on its million-dollar bonded indebtedness. The petition said:

> For more than a year past the earnings of the company from all sources, in excess of the cost of operation, maintenance and other necessary expenses, have been far less than the amount required to enable it to pay the interest upon the bonds and other obligations.

Because of the alleged insolvency of the railroad there was danger of disruption of the system, the trust company asserted in its suit. In this connection it explained that:

> It is of vital importance not only to the holders of the bonds and of the other obligations of the railroad, but also to the public that the operation of the system should not be interrupted or disorganized until the rights of the various bondholders and creditors can be ascertained and an opportunity given for some reorganization or readjustment of the properties.

Increase in Revenue Passengers in Syracuse

The Syracuse lines of the New York State Railways carried a total of 33,458,417 passengers during 1926, an increase of 250,000 revenue passengers over the preceding year, according to a report issued by Benjamin E. Tilton, vice-president and manager. The report covered both the electric railway and bus systems. While the annual financial report is not completed, Mr. Tilton said the gross passenger revenue for electric cars would reach $2,222,000 and for buses the figure was set at $132,770, a total of $2,354,770.

Street cars carried 31,604,430 and buses 1,853,987. The street cars traveled more than 5,000,000 miles and the buses 525,000 miles. Total number of transfers issued was about 6,000,000.

Mr. Tilton announced that the chartered bus business instituted by the Syracuse lines during the year had proved profitable. Buses were chartered on 72 occasions, or about twice a week since the system was installed. Parties were taken to Binghamton, Buffalo, State College, Pa., northern New York and many other points.

Sale of Indiana Road Approved

The Indiana Public Service Commission has approved the purchase of the property and franchises of the Fort Wayne, Van Wert & Lima Traction Company, Fort Wayne, Ind., by the Fort Wayne-Lima Railroad. The road was bought recently at receiver's sale by Edward Hopkinson, Jr. The commission authorized an issue of $100,000, par value, of 6 per cent fifteen-year first mortgage bonds; $441,000, par value, of general mortgage bonds, and 10,290 shares of no par common stock.

In this connection it is interesting to note that in a recent opinion to John W. McCardle, chairman of the Indiana commission, Arthur L. Gilliom, Attorney-General, held that state laws provide sufficient authority for one utility to take over the property and franchises of another public utility operating in Indiana and an adjoining State, and that the only authority necessary from the commission in such a case is approval of any bond issue asked by the purchasing utility.

Mr. McCardle based his question on a petition by the Fort Wayne-Lima Railroad to purchase the Fort Wayne, Van Wert & Lima Traction Company and to issue $641,290 in securities. Mr. Gilliom pointed out that since the railway was recently sold at a judicial sale and that since the law requires the purchaser at a judicial sale, if not a corporation, to organize one, the law gives the new corporation authority and the matter does not rest with the commission.

Hydro May Take Windsor, Essex & Lake Shore

Announcement that the Windsor, Essex & Lake Shore Electric Railway, Windsor, Ont., plans to shut down within 60 days has provoked much comment in the border cities. Following a recent meeting at Kingville attended by civic leaders it was decided that a complete survey of the situation be made with a view toward its possible purchase by the Ontario Hydro-Electric Commission for operation as a part of the Hydro radial services. A tentative price was not mentioned. W. R. Robertson, superintendent of the Hydro lines, reviewing the situation and contrasting bus operation with radial service, believed the Hydro department could operate the Lake Shore road at an estimated annual saving of $100,000. He cited the reduced cost of power as an important consideration. He set the costs of bus operation at 40 per cent higher than radial overhead.

Chicago "L" Issue Going Well

The sale of the new issue of $1,500,000 of prior preferred stock of the Chicago Rapid Transit Company, operating the elevated lines, is now in progress through the Utility Securities Company, Chicago. The new stock, which pays a rate of return of 7.2 per cent, or 60 cents a share a month, is proving a popular investment with middle class investors. It is being sold on the monthly payment plan, as was the former issue, 7 per cent interest being allowed on partial payments. The monthly payment is $10 a share and the stock is being sold at $100 a share. The previous issue of prior preferred is now quoted on the Stock Exchange at several points above par.

Power Equipment of Detroit United Sold

One of the largest sales of its kind in recent years has been announced in Detroit by the receivers for the Detroit United Railway, who have disposed of idle equipment, including four power houses and twelve substations, to the Woodmere Scrap Iron & Metal Company, Detroit, for $800,000. An order in federal court disposing of the equipment was signed by Judge Charles C. Simons.

The steam and electrical power equipment included in the deal was valued at several million dollars when installed many years ago. The main power plants have been idle for the past two years. They are located at Monroe, Rochester, Farmington and New Baltimore. The substations are at Oxford, Conger, South Rockwood, Erie, Earthville, Roseville and two at Atlas.

New Incorporation at Rockford

The Rockford & Belvidere Railway has been incorporated with $300,000 capital. The stock includes 3,000 shares of common at $50 a share and 1,500 shares of preferred at $100. T. M. Ellis is president, William D. Bangs vice-president, Paul V. Harper secretary and John P. Brown treasurer. Offices of the company are at 128 Kishwaukee Street, Rockford, Ill. The corporation is operating the former Rockford-Belvidere branch of the Rockford & Interurban Railway, which, with the Rockford City Traction Company, went into bankruptcy a year ago. Both units were taken over by the Ellis interests.

Net Profit $5,271 in 1926.—The net profit of the Worcester Consolidated Street Railway, Worcester, Mass., dropped from $349,735 in 1925 to $5,271 in 1926, principally because of decline of patronage of its lines and increased operating expenses, according to a report filed with the Massachusetts Department of Public Utilities. In 1925 the railway carried 36,781,407 revenue passengers, while in 1926 the total was only 33,870,220. The railway shows that its operating revenue for the year 1926 amounted to $3,338,544, compared with $3,595,403 in 1925. Although operating revenues declined, operating expenses increased nearly $160,000, being $2,903,725 in 1926 compared with $2,745,002 in 1925. All items of expense except conducting of transportation, which includes wages, increased in 1926 over 1925. As a result of the diminution of profits the railway paid no dividends in 1926, while $348,750 was distributed in dividends in 1925.

The Situation in Chicago Traction Negotiations

Failure of the Chicago Railways to pay off the principal of $55,655,000 of its first mortgage gold bonds on Feb. 1, the date its 20-year franchise with the city of Chicago expired, resulted in the initiation of proceedings the following day in the Federal District Court for the foreclosure of the mortgage by the Harris Trust & Savings Bank, acting as trustee for approximately 50 per cent of the bondholders. There was no contest against the contentions of the bill and the foreclosure was immediately ordered by Judge James H. Wilkerson. The petition asked the court to declare the first mortgage claim a valid first lien and sell the property as an entirety to satisfy it. In the meantime, the court was also asked to have the receivers hold all profits for the trustee and to restrain the company agents and receivers from transferring the property.

In granting the application, Judge Wilkerson also ordered consolidation of the proceedings with the receivership suit of the Westinghouse Electric & Manufacturing Company, which on Dec. 15 appealed for appointment of the present receivers on account of failure to pay a bill of $67,000. The same receivers—John J. Mitchell, Frederick A. Rawson and Henry A. Blair—were reappointed.

Although the court took no legal action on the application for sale of the properties, the natural sequence of this petition is that the company will be given 20 days to make answer. During that time, a formal hearing will be held on the merits of the appeal. With no funds in the treasury to meet the principal of the bonds now due, the property will be ordered sold at the expiration of this period.

Reorganization of the system contemplated by the controlling bondholders, however, will have to wait until the city either passes a new ordinance or the state Legislature passes the necessary legislation, it is believed. If the city grants a new franchise, of either terminable or fixed duration, the main problem is one of refunding. Under existing laws the city may only grant a twenty-year franchise. The companies contend it is impossible to fund present indebtedness under a limited grant. If the city is willing to coincide with that view, then it is predicted both parties will join in a plea of the state Legislature for the necessary enabling laws to permit the granting of an indeterminate permit.

Holders of some $40,000,000 par value of junior bonds of the Chicago Railways and of $39,455,000 first mortgage bonds of the Chicago City Railway and Calumet & South Chicago Railway, which also fell due on Feb. 1, as yet have made no formal demands for payment of their investments.

The aggregate funded debt of the Chicago Railways Company, as shown in its latest published report, is as follows:

First mortgage	$62,785,000
Consolidated mortgage Series A.	16,703,800
Consolidated mortgage Series B.	17,164,475
Purchase money mortgage	4,073,000
Adjustment income mortgage	2,500,000
Underlying securities	1,980
Total	$103,228,255

Of this amount, approximately $8,594,000 of bonds are unsold and still remain in the company's treasury, leaving a total of $94,634,185 in the hands of the public.

Because the bondholders will be interested in protecting their property, the local transportation committee of the City Council recognized their right to be represented at future hearings on all traction ordinances by postponing further sessions until after the bondholders come into control of the property. That numerous aldermen are now in the midst of heated campaigns for re-election on Feb. 22 is also given as another reason for the recess.

Petition Dismissed.—The California Railroad Commission has dismissed the application of the Union Traction Company for authority to abandon its stage lines operated between Santa Cruz and Capitola and intermediate points and between Santa Cruz and Twin Lakes and intermediate points.

Deficit on Lake Shore.—The gross earnings of the Lake Shore Electric Railway, Cleveland, Ohio, for the period from Jan. 1 to Nov. 30, 1926, was $2,947,274, against $2,924,613 for a similar period the year previous. Operating expenses and taxes increased from $2,416,604 to $2,554,098. After the consideration of interest the company concluded the eleven months period with a deficit of $14,197, against a surplus the year previous of $113,496. The Lake Shore Electric Railway has asked permission of the Ohio Public Utilities Commission to discontinue railway service on its line from Sandusky to Norwalk, Ohio.

Net Income Lower.—The operating revenues of the Eastern Massachusetts Street Railway, Boston, Mass., for December, 1926, were $927,815, compared with $850,448 for December, 1925. The net income for December after taxes, charges and depreciation was $102,548, against $112,711 in December, 1925.

New Preferred Stock Issue.—The directors of the Midland Utilities Company, Chicago, Ill., on Jan. 17 authorized the issuance and sale of $1,000,000 of its 7 per cent cumulative class A preferred stock. Public offering of this stock will be made at once by the Utility Securities Company, Chicago. The Midland company owns or controls companies serving 201 communities in northern Indiana and western Ohio with an estimated population of 850,000. The total investment of the subsidiary companies in properties is $94,318,673. The chief transportation subsidiaries of the Midland Utilities Company are the Chicago, South Shore & South Bend Railroad, Gary Railways, Shore Line Motor Coach Company, Indiana Service Corporation and the Marion & Bluffton Traction Company.

Book Reviews

Accounting Procedures for Public Utilities

By Warren G. Bailey, M.A., and D. E. Knowles, C.P.A. Chicago and New York: A. W. Shaw Company. 459 pages. Price, $7.50.

This is a massive volume. It runs to the extent of 459 pages. This is not said as a deterrent, but is intended merely to convey an idea of the extent to which the authors have gone in covering their subject. To do the contents of the book full justice in a review of this kind would be impossible. Limitations of space make a critical summary of the volume out of the question. It seems better unequivocally to indorse the work as a whole and then to attempt to summarize the purpose of the authors and to convey an idea of the contents of the volume.

The present volume is the first of the series of so-called Public Utility Text to be published under the auspices of the Institute of Research in Land Economics and Public Utilities with Richard T. Ely, editor-in-chief, and Herbert B. Dorau, managing editor. This series is intended to cover the entire field of public service company operation and management. One finds himself heartily in agreement with the editors that as a study in a special aspect of public service company business administration "Accounting Procedures for Public Utilities" represents a real and valuable contribution to the literature on utilities.

As for the authors, who dedicate the volume to the public utility accountant, whose importance in the industry has been underestimated and whose work is essential to the proper management of utility companies, they have sensed the need for a reference book that would in a satisfactory manner review briefly the accounting practices in utility companies. As they point out, the compilation of accounting and financial data is logically the function of the accountant. To assemble these data accurately, the forms, methods and procedures he uses must be appropriate and complete. To this end the authors have attempted to describe the accounting records that have been found necessary, to explain briefly the manner in which the records are kept and to indicate the purposes for which the accounting information is used. In most instances the procedures presented are a composite of those used in various companies. In a few instances only are more or less specific practices discussed. It has been felt by the authors that procedures discussed or presented in a general way would be of greater assistance to executives and students of accounting than would procedures of particular companies. The authors warn the reader, however, that few records and practices used effectively in any one company can be used successfully *in toto* in another company.

There is, of course, a certain futility about giving a list of chapter headings. Yet in a review, fixed as to space limitations, there is, perhaps, no better way to convey an idea of the contents of a volume of this kind, particularly a business book. So the headings of the chapters are appended:

(1) Introduction; (2) Place of Accounting in Public Utilities; (3) Uniform Accounting for Utility Companies; (4) General Accounting Books; (5) Expense Accounting; (6) Timekeeping and Pay-Roll Methods; (7) Distribution of Labor Charges; (8) Departmental Responsibilities in Accounting for Materials; (9) Accounting for Materials and Supplies; (10) Plant Accounting; (11) Current Liabilities; (12) Revenues from Utility Services; (13) Revenue Accounting for Electric, Gas and Water Services; (14) Accounting for Merchandising Sales; (15) Accounting for Revenue of Electric Railways; (16, 17, 18 and 19) Customers' Accounting; (20) Accounting for Customers' Payments and Petty Cash; (21) Accounting for Refunds and Adjustments with Customers; (22) Auditing Procedure; (23) Budget Procedure; (24) Interpretation of Financial and Operating Statements; (25) Public Utility Construction and Extensions; (26) Accounting for Capital Stock and Dividends; (27) Accounting for Capital Stock Sales.

As a piece of bookmaking the volume is in consonance with the text. All in all, the book reflects great credit on the authors, the editors and the publisher.

Notes on the Collection of Transfers

By Frank Folupa. Philadelphia, Pa.: Dorrance & Company. 306 pages. Price $2.

Are you a peridromophile? You need not consult the psychoanalysts or the behaviorists for an answer to this question, for its field is new even to them. Only you yourself can settle the mooted point. Did you ever impulsively or with studied malice pay an extra fare on the street cars rather than relinquish the orange-colored, mysteriously marked and deliberately punched transfer? If so, you are a believer in the science of "peridromophily," the name assigned by Frank Folupa in his "Notes on the Collection of Transfers" to the habit of collecting transfers.

Few people in this workaday world see anything of beauty in a street car transfer, evidenced by the various drastic changes the forms undergo before being deposited in the hands of the waiting conductors or receptacles. Not so do these specially colored slips, with their listings and punches, affect the transfer collector. This particular one has more than an academic interest in the origin of transfers. He is especially intrigued with their destiny—namely, personal collection—and this hobby he constantly reminds his readers is not for fraudulent purposes but rather as an honest avocation. Why, he wonders, should not the collecting of transfer forms be just as interesting as collecting coins and stamps. Besides, transfer collecting has this advantage—it can never be commercialized, "since trading in transfers is illegal. . . . Therefore, collectors must always be amateurs collecting for the intrinsic interest in it."

And if the avocation of the collector is honest, it is delightful, too, he finds. On transfer forms one can be transported into the unbounded realms of history and knowledge, although these same slips appeared at first commonplace and stodgy. On this point he says: "A trolley ride along the traditional route or close to it, with a souvenir in some such form as a transfer used in Lexington, can add some interest to the history of Paul Revere's ride. A collection of Washington transfers seems to make news from the capital seem a bit more realistic, especially such forms as mention well-known places like the Capitol, the Treasury, Pennsylvania Avenue."

To one concerned in transportation questions or to one who has already acquired an interest in collecting transfer forms, this book should be of inestimable value. It is a carefully prepared, technical treatise on transfer privileges and classifications. Fare limits, overlaps, reversibility, direction punches, square box type, Ham type, Pope type and other equally perplexing terms to the layman are treated at considerable length. Supplementing the text are appendices dividing the United States into geographical divisions and subdivisions as a sample of a code notation of transfer systems.

But granting the reader has never found inspiration in transfers and will likely never indulge in the transfer-collecting hobby, the book contains entertaining and instructive matter. Even a cursory glance may be productive of reminiscent moods in which transfers played some part, though that part was negligible. Some such nostalgia affected one reader of a review published in a New York daily. Through the reviewer he subsequently offered to the author of "Notes on the Collection of Transfers" his own collection dated 26 years ago. Just a mention of this hobby was enough to carry him back to the days of his boyhood, when he and other kids in the neighborhood awaited the return of their traveling salesmen fathers, who in a big-hearted way dumped out of their pockets transfers from San Francisco, Louisville, Boston, St. Louis and several other cities. If the wandering transfers could have told their tales, . . . when will we have the autobiography of a transfer?

The Rapid Transit Situation in Greater New York

Many persons other than New Yorkers will be interested in this booklet of 70 pages, which contains the open letters of G. M. Dahl, chairman of the board of the Brooklyn-Manhattan Transit Corporation, on the Greater New York transit situation written during December, 1926, and January, 1927, to the Transit Commission of the State of New York and the Board of Estimate & Apportionment of the city of New York.

Mr. Dahl explains that the letters were written with the sole purpose of creating constructive discussion of local transit matters, and to aid in bringing about a co-operative effort on the part of existing transit companies and city and state officials for a solution of the transit problem, equitable alike to all interests—the public, the city and the companies.

Personal Items

Luke C. Bradley Heads New Providence Company

Luke C. Bradley, Richmond, Va., has accepted the invitation of the board of directors to become president of the Rhode Island Public Service Company, Providence, R. I. He will succeed Louis C. Gerry, and will assume his new duties about Feb. 20.

Mr. Bradley has resigned as president of the Virginia Electric & Power Company to accept this position. As head of the Service Company he will supervise the operations of the Narragansett Electric Light Company and the United Electric Railways, which have been merged under the Service Company.

Mr. Bradley has been associated with Stone & Webster, Inc., for the past 22 years in executive capacities. As president of the Virginia Electric & Power Company he had direct oversight of the electric light and power properties, electric railway lines, bus systems and gas properties in Richmond, Norfolk, Portsmouth, Peterburg, Fredericksburg and other cities in Virginia and extending into northeastern North Carolina.

The Virginia Electric & Power Company is controlled by the Engineers Public Service Company, and is under the executive management of Stone & Webster, Inc. Stone & Webster are also interested in the New England Power Association, which controls the Rhode Island Public Service Company. Mr. Bradley will be elected a director of the New England Power Association. He has been executive vice-president and division manager of the utilities properties under the management of Stone & Webster in Louisiana, Texas, New Mexico, Wisconsin, Nebraska, Wyoming and Colorado, serving about 100 cities and towns in these states. He is severing his connection with Stone & Webster in becoming connected with the Rhode Island Public Service Company.

Fred Hamilton President in Omaha—Other Changes

At the annual meeting of the Omaha & Council Bluffs Street Railway, Omaha, Neb., held on Jan. 10, a change in officers was effected as follows:

Fred Hamilton was elected president, succeeding W. A. Smith.

R. A. Leussler, formerly a vice-president and the general manager, will continue as general manager and assume the first vice-presidency.

J. A. Munroe, formerly vice-president, is now designated as second vice-president.

The new president, Fred Hamilton, has been a member of the board of directors of the company for the past seven years, and during 1926 was first vice-president. He is well known in banking circles, being president of the Merchants National Bank until the consolidation of that bank with the Omaha National Bank last April. He is at present vice-president of the Omaha National Bank.

M. Ackerman Heads C.E.R.A.

Martin Ackerman, general manager the Lake Shore Electric Railway since Feb. 1, 1926, was elected president of the Central Electric Railway Association at its meeting in Toledo, Ohio, on Feb. 3-4, 1927. Mr. Ackerman is well known in the Central West, particularly for his affiliations with the Cincinnati & Dayton Traction Company and the Lake Shore Electric Railway.

In accepting the general managership of the Cleveland interurban a year ago he returned to the property on which he obtained his early electric railway experiences. Here he started at the bottom, receiving in the course of time many advancements. Early in his career he was identified with the Youngstown & Ohio River Railway, and later with the Springfield & Xenia Railway and the Interurban & Terminal Company at Cincinnati. As a result of his efficient handling of the latter property Mr. Ackerman was made general manager of the Cincinnati & Dayton Traction Company in July, 1918. He encountered many difficulties, but his efforts at restoration did bear much fruit. He remained with this railway until Feb. 1, 1926, when he went to Sandusky as head of Lake Shore. At that time his career was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 6, page 268.

Martin Ackerman

Changes in Personnel of American Light & Traction Company

Alanson P. Lathrop, president of the American Light & Traction Company, New York, since 1909, has been elected chairman of the board of directors. R. B. Brown, who had been vice-president and general manager of the Milwaukee Gas Light Company several years, has been made president to succeed Mr. Lathrop.

W. E. Wood Made President at Richmond

William E. Wood, who has served as vice-president and general manager of the Virginia Electric & Power Company, Richmond, Va., since operation and control of the properties were taken over by Stone & Webster, Inc., Boston and New York, in 1925, will become president of the company, succeeding Luke C. Bradley. J. Frank McLaughlin, in charge of the company's Norfolk division, will succeed Mr. Wood as first vice-president, retaining his headquarters in Norfolk.

Mr. Wood joined the Stone & Webster organization immediately on graduation from the Georgia Institute of Technology. After a few months in the company's Boston offices he was sent to Jacksonville, Fla., where he eventually became superintendent of transportation. His promotion was rapid. Both Mr. Wood and Mr. Bradley came to Richmond in June, 1925, from highly successful management of the Stone & Webster properties in Texas, and they are now completing a $20,000,000 program of improvements and extensions for the Virginia Electric & Power Company in Tidewater Virginia and northeastern North Carolina.

Changes in Personnel of the Capital Traction Company

Edwin P. Goucher, formerly assistant engineer, has been appointed engineer of way and structures, and Joseph H. Dierken, formerly head of the electrical department, has been made electrical engineer of the Capital Traction Company, Washington, D. C.

Mr. Goucher has had charge of track construction for the Capital Traction Company for several years and has started some very valuable methods of construction which have materially reduced costs. His application of labor-saving tools in this work has shown remarkable results. He is a graduate of public schools and technical high school of Washington, D. C. For six years he served as assistant engineer in the surveyor's office in the District of Columbia. In 1917 he worked as assistant engineer at the United States Naval Academy, Annapolis, Md., on construction work and joined the engineering force of the United States Navy in 1918 as inspector of construction, Philadelphia Navy Yard. A year later Mr. Goucher was appointed assistant engineer in the way department of the Capital Traction Company.

Mr. Dierken entered the service of the Capital Traction Company in 1909 in the electrical department. He was appointed chief electrician in 1917. During the past five years he has had entire charge of the electrical department. Mr. Dierken is a graduate of Georgetown University Preparatory School, St. John's College, and Bliss Electrical School of Washington, D. C. In 1906 he served with the J. G. White Company and in 1907 and 1908 with the Westinghouse Electric & Manufacturing Company's construction department.

E. J. Anderson Advanced at Davenport

E. J. Anderson, formerly general superintendent of the Tri-City Railway, Davenport, Iowa, has been made general superintendent of both the Tri-City Railway of Illinois and the Tri-City Railway of Iowa, with offices in Rock Island.

Arthur Grunwald, formerly assistant superintendent in Davenport, is made division superintendent of the Iowa lines under Mr. Anderson.

John Arnell continues as division superintendent of the Illinois lines.

Frank V. Skelley, for several years an assistant under T. C. Roderick former general manager of the Illinois lines but now at Ottumwa, is made transportation engineer for the entire Tri-City Railway lines.

H. W. Blake Goes Abroad

Henry W. Blake, senior editor of the ELECTRIC RAILWAY JOURNAL, sailed for Europe on Feb. 10 on the *Conte Biancomano* on a business and pleasure trip that will extend over a period of several months. He expects to arrive in Naples on Feb. 22 and will proceed thence to Rome, Florence, Milan, Nice, Paris, Brussels, Berlin, Hamburg and London. Mr. Blake will travel leisurely, as bespeaks the scholar that he is, studying and drawing upon the background of previous trips and the inherent culture that is his. He will contribute to the JOURNAL some of his observations on public utility practices, particularly in the field of city railway operation and heavy electric railroading.

D. A. Powell at Muskegon

D. A. Powell was recently elected vice-president and general manager of the Muskegon Traction & Lighting Company, Muskegon, Mich. From November, 1925, until his recent appointment Mr. Powell was employed by the American Light & Traction Company, as traveling engineer. He is a graduate of the University of Wisconsin, 1907, with a degree of bachelor of science, school of electrical engineering. Upon graduation, he entered the employ of the Madison Gas & Electric Company as chemist, cadet engineer, and engaged in construction work and plant appraisal for rate-making purposes. In 1910 he was transferred to the Milwaukee Gas Light Company and was employed by this company until 1925. During that time he acted in the capacity of construction engineer and later he served as engineer of distribution.

R. R. Cheever, associated for many years with the Pacific Electric Railway, Los Angeles, Cal., was recently appointed to the position of the assistant chief clerk in President William Sproule's office. For the past six years he had been secretary to Mr. Sproule. He entered the service of the Pacific Electric Railway in Pasadena in 1906 as stenographer in the superintendent's office and was advanced to similar positions in the general manager's office and later in the office of the vice-president. Subsequently he was secretary to Paul Shoup, at that time vice-president of the Pacific Electric. Following this assignment he became chief clerk in that office. Before going to San Francisco, in 1920, Mr. Cheever was secretary to H. B. Titcomb, who was then vice-president of the Pacific Electric Railway.

Lewis E. Gettle, chairman of the Wisconsin Railroad Commission since 1922, at which time he succeeded Carl D. Jackson, resigned, has been reappointed by Governor-elect Zimmerman. His new term will expire in 1933.

Ray A. Poteracke, head bookkeeper of the Grand Rapids Railway, Grand Rapids, Mich., has been promoted by Vice-President and General Manager DeLamarter to chief clerk in charge of accounting. Mr. Poteracke entered the service of the company ten years ago as a storeroom clerk.

T. F. Gnevo, former general agent of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has assumed the duties of assistant general passenger agent of the North Shore Line with offices at Milwaukee, Wis., to which position he was recently appointed. Mr. Gnevo succeeds R. S. Amis, who has been promoted to general passenger agent. The new assistant general passenger agent has served as passenger traffic representative on various steam and electric railways for the past eighteen years.

Hazen J. Payette has resigned as secretary to Mayor John W. Smith of Detroit, Mich., to become chief trial attorney for the Detroit Department of Street Railways. Following the close of the World War, Mr. Payette joined the claims department of the Detroit United Railway and when the Detroit United lines were taken over by the city of Detroit he entered the employ of the city, serving the Department of Street Railways in a legal capacity. He remained with the department until nine months ago, when he became secretary to the Mayor. He is 28 years old. He was graduated from the University of Detroit law school.

R. E. Jamieson, for the past year district passenger agent for the Chicago, South Shore & South Bend Railroad, South Bend, Ind., was recently appointed district passenger agent with offices in Chicago. Mr. Jamieson's experience in railroading began in 1911 with the Grand Trunk System at London, Ont. Since that time he has been engaged in various capacities in passenger solicitation work. He was connected with the Canadian Pacific Railroad in Chicago prior to his service with the South Shore Line. He was elected president of the Chicago Passenger Club, an organization of electric and steam railroad and steamship passenger agents, at its annual meeting in December, 1926.

James H. Powell, formerly assistant superintendent of transportation of the Scranton Railway, Scranton, Pa., has been appointed superintendent of transportation. He succeeds in that capacity George C. Towle, recently resigned. Mr. Powell has risen from the ranks.

A. I. Hunter has replaced L. Stinson as vice-president of the Grand Forks Street Railway, Grand Forks, N. D. He was formerly treasurer.

Joseph M. Nolan has succeeded James H. Powell as assistant superintendent of transportation of the Scranton Railway, Scranton, Pa. Mr. Nolan has been an employee of the company for more than twenty years.

A. J. Goedjen, manager of the Menominee & Marinette Light & Traction Company in Menominee, Mich., and Marinette, Wis., has been named manager of the northern division of the Wisconsin Public Service Corporation under a rearrangement of divisions. Mr. Goedjen's supervision over the operation of the corporation's properties will be widened to include twelve more communities.

Obituary

William L. Schulz, formerly claim agent for the Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, Md., died on Jan. 10 at his home in West Annapolis. Mr. Schulz went with the company in 1908 and remained there until his health forced him to retire.

Alfred J. Becht, active in civic affairs of Cincinnati, Ohio, and identified with traction interests, died recently. On Nov. 14, 1910, Mr. Becht became secretary of the Cincinnati Street Railway, succeeding James A. Collins. He served in this capacity until Jan. 1, 1926, when he resigned to devote his time to his various personal interests. Prior to the sale about four months ago of the Toledo, Bowling Green & Southern Railroad Mr. Becht was its secretary. He also served the Cincinnati-Hamilton Traction Company in a similar capacity until it was taken over recently by the Cincinnati Street Railway.

W. C. White, superintendent of the western division of the Pacific Electric Railway, Los Angeles, Cal., for many years, died recently. He had been a resident of Los Angeles for more than 30 years.

William Wright, auditor for the Washington, Baltimore & Annapolis Electric Railway, with headquarters in Baltimore, Md., died suddenly on Jan. 5. He was found unconscious at the wheel of his automobile in his garage. His death was due to apoplexy. Mr. Wright was 65 years old.

William H. Hodgins, secretary of the Okonite Company, died recently at his home in Glen Ridge, N. J. Mr. Hodgins had been associated with the Okonite Company for more than 40 years and served for many years as a director in addition to his office as secretary. During his long connection with the Okonite Company he had seen the wire and cable industry develop from its earliest application to its present tremendous proportions.

George William Norwood, 83 years old, Kokomo, Ind., one of the promoters and builders of the interurban line of the Marion & Bluffton Traction Company, Bluffton, Ind., died recently in Lebanon.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

$5,000,000 for Steel Equipment

Long Island Railroad Outlay Includes 60 Motor and 30 Trail Cars for Electric Service

George Le Boutillier, vice-president of the Long Island Railroad, announced this week that by the end of 1927 every passenger-carrying car operated in both steam and electric train service on the Long Island Railroad system will be of steel construction. This means that the Long Island will be the first Class I railroad in the United States to retire all remaining wooden cars and place its passenger-carrying equipment on a 100 per cent steel basis.

Orders will be placed immediately for 127 new steel passenger cars. Of these 117 will be coaches and ten combination baggage and passenger cars. As wooden cars have not been operated in electric passenger train service for many years, the new steel cars to be ordered will be used on steam trains, although they are of such a type as may readily be converted into electric motor or trail cars. This new equipment represents an investment of $2,114,188. In addition to the cars covered by the new authorization, the company will put in service this year 114 new steel passenger cars which are now under construction at a cost of $2,902,286. The latter order includes 60 motor cars, 30 trail cars for electric service and 20 coaches and four combination cars for steam service. The outlay for new equipment to be placed in service during 1927 will therefore amount to more than $5,000,000.

Upon delivery of the 127 cars just authorized and the 114 now being built the Long Island will have a total of 1,411 steel passenger-carrying cars and no wooden cars.

Hyatt Names New Sales Manager and Chief Engineer

H. J. Forsythe, president of the Hyatt Roller Bearing Company, Newark, N. J., announces the appointments of H. O. K. Meister as general sales manager and A. W. Scarratt as chief engineer.

Mr. Meister joined the Hyatt forces more than fourteen years ago, locating first as an engineer at the home office in Newark. Later he was transferred to the Chicago office, where, after a few years, he took over the supervision of Hyatt sales work in the Western territory.

Eighteen months ago Mr. Meister was appointed assistant sales manager and remained in the headquarters at Newark, where he will continue to be located as general sales manager.

Mr. Scarratt is well qualified to take over the duties of chief engineer on account of his past experience in the design and construction of automotive, tractor, railroad and industrial equipment. He joined the Hyatt engineering staff a few months ago as assistant chief engineer. Mr. Scarratt will remain at the headquarters in Newark.

Both Mr. Meister and Mr. Scarratt are members of the Society of Automotive Engineers and have held important offices in the sections where they were previously located.

Supplementary Compensation for General Electric Employees

Supplementary compensation totaling $1,358,669.89 was distributed in February to 30,518 factory and office employees who have been in the employ of the General Electric Company for five years or more. The distribution was based on 5 per cent of the employee's earnings for the six months from July 1 to Dec. 31, 1926. Payments were made in General Electric Employees' Securities Corporation bonds or in cash, as the employees desired. The largest amount was paid to Schenectady employees, who received $452,489.

Large Terminal for Watertown

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has two electric railway improvements under consideration for Watertown, Wis., provided authority to carry them out is received from the City Council. One plan calls for the removal of the company's tracks on Main Street to Western Avenue and Second Street and the other the building of a large terminal to which point all lines would run directly. These two proposals, which were circulated by the Council among business men of the city in the form of ballots on which to indicate their approval or disapproval, found 63 business men who favored removal of the tracks and 27 against it. To these ballots was attached another proposal, requesting that the company replace the railway service with buses.

Metal, Coal and Material Prices

Metals—New York	Feb. 8, 1927
Copper, electrolytic, cents per lb	12.30
Copper wire, cents per lb	14.50
Lead, cents per lb	7.425
Zinc, cents per lb	6.90
Tin, Straits, cents per lb	69.50
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.95
Somerset mine run, Boston, net tons	2.30
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N.Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb	10.9
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.78

New Equipment for Cincinnati, Hamilton & Dayton

In line with its extensive rehabilitation program the Cincinnati, Hamilton & Dayton Railway has placed an order for ten all-steel high-speed interurban cars with the J. G. Brill Company. Each car will seat 50 passengers—sixteen in a smoking compartment and 34 in the main section. Delivery is expected about May 1, at which time the present interurban equipment will be retired.

With a lower center of gravity, the car floor 1 ft. nearer the ground, and three easy steps in place of the four steep risers on the present interurban equipment, the new cars will provide every comfort from the passengers' standpoint.

Specifications call for an extensive finish in Duco, the color scheme a brilliant Tuscan red with black and gold lettering and striping to conform with company's standards for maximum visibility and elegance. The interior finish will be in rich mahogany, set off by rubber tile flooring and Pullman type dome lights. All cars are to have Hale & Kilburn deep cushion, double spring, curved back, leather seats, and will be equipped with water flush toilets and wash basins, and sanitary water coolers of the indirect icing type, all of the very latest models.

In order to minimize the possibility of accidents while operating in the city, a concealed group of lights over the front dash of the cars has been specified. The front end of each car will be lighted in this manner when the headlight is dimmed while running through city streets. In addition to a red tail light there will be a stop light which is to function when the brakes are set, thus giving motorists a caution signal that a stop is about to be made.

To insure the maximum comfort for trainmen, permanent sun visors over the motorman's window, automatic window cleaners, comfortable leather chairs, and special electric heaters have been specified.

Of the ten cars, seven will carry baggage compartments, the other three being designed for double-end operation. An automatic coupling device provides for connecting the air line and for making all necessary electrical contacts for motor control. Each car will be equipped with four 60-hp. Westinghouse ventilated motors.

Spanish Northern to Extend Electrification

The Spanish Northern Railway is about to electrify its lines, starting from Barcelona, through all of the section Barcelona-Manresa and the line Lerida-Varagoza, as well as the section running toward San Juan de las Abadesas in the Pyrenees. On all these lines direct current of 1,500-volt tension will be used.

Rolling Stock

Mississippi Valley Public Service Company has added two new one-man safety cars to its equipment. These cars embody the latest developments in street car design and have been placed in service in La Crosse, Wis.

Fageol Company, Kent, Ohio, reports delivery of two buses to the Scranton Railways and fifteen buses to the city of Detroit, Department of Street Railways, during the period from Dec. 15 to 31, inclusive.

United Railways of St. Louis, Mo., is equipping all of its 1,800 cars with automatic window wipers as a safety measure. The wipers will assure the motorman a clear vision in all kinds of weather. They work on the same principle as the more familiar automobile windshield wiper, but cover a much larger area of the glass. Fifty cars on the Park Avenue division and several on the various suburban lines have already been equipped with the cleaners.

Track and Line

Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio, has commenced the reconstruction of its line between Dayton and Cincinnati, it was announced this week by J. H. McClure, vice-president and general manager. The work will cost approximately $200,000.

Athol & Orange Transportation Area, Orange, Mass., shows much activity in the way of improvement in the past year. The tracks and bridge between Athol and Brookside Park, about half way to Orange, have been reconstructed; 1,000 ft. of 60-ft. rail has been laid in South Main Street, Athol, and 4,000 new ties have been placed. In addition more than 2,000 ft. of overhead was installed with new span wires and poles. The largest expenditure was for power, which cost $12,908.

Trade Notes

Raymond H. Liefeld, formerly a salesman for the Packard Motor Car Company, has joined the forces of the Bridgeport Brass Company of Bridgeport, Conn.

Mather Garland has been appointed acting general manager of the Hegeman-Castle Corporation of Chicago, replacing W. E. Kelly, resigned. The Hegeman-Castle Corporation is owned and controlled by the National Railway Appliance Company of New York.

American Brown Boveri Electric Corporation, Camden, N. J., announces that Harold D. Gregory has just joined the patent department. Mr. Gregory is a graduate of the George Washington University law school and also a Stevens Institute graduate in engineering. For several years he was patent examiner of the Eastern Railroad Association at Washington, D. C., and for the past few years has been with Bottom, Hudnall, Lecher & McNamara of Milwaukee, Wis. With the former, he conducted infringement and validity investigations for the railroads, as assistant to General Counsel Robert J. Fischer. With the latter company Mr. Gregory was solicitor of patents in the patent department.

Edwin Besuden has joined the sales organization of the National Railway Appliance Company in the capacity of special representative, with headquarters at the main office of the company, 452 Lexington Avenue, New York City. Mr. Besuden was for many years sales manager of the Jewett Car Company, and later served as manager of the railway department Chicago Varnish Company in the Eastern district. Due to a typographical error in the JOURNAL of Jan. 29, Mr. Besuden's name was printed "Desuden."

Manganese Steel Forge Company, Philadelphia, Pa., has appointed Harry Howe engineer of railway equipment in connection with the development of the use of Rol-Man Steel in steam and electric railway passenger and freight equipment. Mr. Howe has resigned as special engineer for the Pressed Steel Car Company, after 21 years service with that concern. He is entirely familiar with all types of steam, electric and freight car details of equipment and design.

Rome Wire Company, Rome, N. Y., has opened a new warehouse for the purpose of serving its Detroit territory. The warehouse is located at 199 Minnie Street, Detroit. It is under Herman C. Joos, the district manager of the company at Detroit, who has always been in charge of this territory.

International Steel Tie Company announces the appointment of Frederic A. Tayler, Richmond, Va., as its southeastern representative, to handle all business in Virginia, North and South Carolina, Georgia, Florida and a part of Tennessee and Alabama. Mr. Tayler was born in Philadelphia on April 7, 1898. He was educated in the public schools there, but removed to Spokane, Wash., in 1912. There he continued his education, entering the Lewis and Clark High School. He left this school in 1915, his senior year, to accept a special apprenticeship with the Baldwin Locomotive Works at the Philadelphia plant. When he had completed this course Mr. Tayler was transferred to the Eddystone plant as track foreman of engines. Later he was promoted to assistant advertising manager in Philadelphia. On Sept. 12, 1921, he was transferred to the domestic sales department, going to the Richmond, Va., office as sales representative. He filled this position until Jan. 1, 1927, when he engaged in the railway supply business.

Ames Shovel & Tool Company, Boston, Mass., announces the appointment of N. E. Brooks as representative in the railway sales division of the Oliver Ames & Sons Corporation. Mr. Brooks is a graduate engineer of Massachusetts Institute of Technology, and comes to the Ames Shovel & Tool Company with fifteen years' experience in railway sales work. His headquarters will be at 41 Park Row, New York City.

New Advertising Literature

Ohmer Fare Register Company, Dayton, Ohio, has just issued a new circular describing its ticket printing register, type 79. The machine is designed for use on buses as well as street cars.

W. S. Godwin Company, Inc., Baltimore, Md., is distributing a new booklet describing steel paving guards. "Booklet 27" contains comprehensive photographs and cross sections showing the application of this product to road edging, street railway paving platforms and steps, sewer inlets and columns.

American Brown Boveri Electric Corporation, Camden, N. J., is mailing out a handsome booklet dealing with the merits of its steam turbo-generators. Splendid illustrations, charts and diagrams are features of the new mailing piece.

Hyatt Roller Bearing Company, Newark, N. J., has announced that the recently named headquarters for the central sales division are now located at 806 Fulton Building, that city. They were formerly at 1352 Union Trust Building. The new location provides amply for the increased sales and engineering forces of the central division, functioning under the direction of B. H. Lytle. H. R. London, a new member of the Pittsburgh force, is now operating in the industrial field of W. L. Iliff.

General Electric Company, Schenectady, N. Y., has just issued a new loose-leaf circular describing arc-welding, equipment. In the main, the circular details recent developments in helmets for operators of arc-welding apparatus.

Dunn Painting Machine Company, San Francisco, Cal., has issued a pamphlet describing the Dunn patent painting machine and the Dunn patent cleaning process. The Dunn equipment and process feature the complete breaking up and atomization of the paint in the machine itself and not at the nozzle. The paint is carried in suspension in the atomized form through a single line of hose for any reasonable distance. The Dunn company believes that this insures a more uniform application of paint than when the atomization is accomplished at the nozzle.

Ohio Brass Company, Mansfield, Ohio, is distributing a descriptive mailing piece which presents new O-B bonds, designated as Hebi-bede Titon and AW-12. The first bond is especially designed for use on heavily beaded and Weber type joints where it is impracticable to install the ordinary type of rail bond. It embodies all the features of the Titon bond, including steel terminals and copper sleeves. The AW-12 bond can be wedged firmly to the rail base by the tap of a hammer before welding is started.

Kentucky Rock Asphalt Company, Louisville, Ky., has just issued "The Story of Kyrock," a booklet describing its natural asphaltic paving material which is mined in Edmonson County, Kentucky. Halftone illustrations give a very clear idea of its application to paving projects of every description, including its use in connection with street railway construction.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, February 19, 1927 *Number* 8

Equipment Men's Conferences Worthy of Active Support

COMPARATIVELY new is a phase of sectional association activity represented by the rapid development during the last few years of territorial conferences among groups of maintenance men. Two groups worthy of mention are the Electric Railway Association of Equipment Men, Southern Properties, and the Central Electric Railway Master Mechanics' Association. A report of the recent Toledo meeting of the C.E.R.A. men is published elsewhere in this issue. The meeting of the Southern equipment men in Memphis was reported in the Feb. 5 issue of the JOURNAL.

Both of these bodies have become actual working conferences of maintenance executives rather than merely sectional association meetings. That the men who take part mean business is apparent to any one who has attended their meetings. Better acquaintance, good fellowship and sectional spirit are desirable and laudable objectives of sectional association activity. But these maintenance men go much further than that. They make a critical comparison of their practices and methods and express their ideas as frankly as in a staff conference on their own properties. Their purpose is to find their own shortcomings, and that is the road to progress. General executives of the properties located in the territories covered by these maintenance groups may well afford to lend full measure of their support and backing.

Greater Interest Is Warranted in Economies of Treated Timber

OPPORTUNITIES to make substantial savings by preservative treatment for ties and timber that are used by electric railways have been much neglected. During the past three or four years there has been a slight increase in the interest shown in this important subject by electric railway mangements, but it has lagged far behind that shown by the steam railroads. General adoption of a policy of obtaining the maximum life of all timber used undoubtedly would save the industry a large sum every year.

Desire to keep the initial expenditure to a minimum is probably the principal reason why electric railways have continued to use large quantities of untreated timber. This is a penny-wise and pound-foolish policy, as in many cases the untreated wood deteriorates rapidly. The criterion of economy is the annual cost rather than the initial. In this connection, the experience of the Boston Elevated Railway, as given in an article elsewhere in this issue, is a convincing argument in favor of preservative treatment. On that system the cost per treated tie per year is only 8.7 cents as compared with 13.3 cents for untreated. Thus treatment has reduced tie cost approximately 35 per cent.

Another important factor not always appraised at its full value is the possibility of using a cheap grade of timber when preservative treatment is applied. In Boston, standard or merchantable grade is now employed for many purposes where previously it was considered necessary to use only hard timber of first quality. Judging by the experience of this company, it appears that the economy claimed for the policy of using untreated timber because of its lower initial cost is largely fictitious, and that real economy in the long run will result from greater use of the preservative treatment process. Moreover, in view of the dwindling supply of timber in this country its conservation by every means has become a moral obligation which should be heeded before increasing costs due to scarcity makes it a financial one.

A Damaged Commutator Invariably Means Expensive Rewinding of the Armature

SO MUCH depends on the perfect operation of a railway motor armature that it is important to keep it in as good operating condition as possible. Even though the armature may appear rugged, the component electrical parts must be insulated from the metal core. This necessarily makes some of these parts relatively delicate. It is a rather simple operation to insulate and support the armature conductors in the core, but to insulate the commutator bars from each other and then insulate the entire assembly from the core and from the shaft makes the problem more difficult.

Nearly every commutator failure that occurs today means a new set of armature coils and a labor charge to strip and rewind the armature, while a coil failure usually does not affect the commutator. Therefore, when purchasing a set of assembled segments to refill a commutator, they should measure up with the highest material and workmanship standards. These requirements are the result of costly investigation over a period of years by both manufacturers and operators.

It is also essential that the commutator be assembled correctly. A certain railway purchased a set of assembled segments to refill a commutator. These met all the requirements of a good specification and the commutator was placed on the armature and the motor returned to service. During the morning rush period of the first day the motor was in operation the motor failed. The trip was completed in order not to tie up traffic, but the commutator bars were strewn along the track. When the car returned to the carhouse and an inspection of the motor was made it was found that the

This is the issue in February that is devoted essentially to maintenance and construction subjects

commutator structure had loosened and all of the bars were missing. The armature and field coils were damaged beyond repair. The brush-holders had broken from their supports and lay in the bottom of the motor case.

Due to the damaged condition of the motor it was impossible to determine the cause of the failure. It seemed most probable that there had been improper assembling of the commutator on its spider. Evidently the holding nuts had loosened to such an extent that the bars had come out of the V rings. Proper methods had not been used to tighten the assembly and to insure that the whole structure had been heated sufficiently to secure a permanently tight fit. Probably it had not been inspected cold to be certain that the bars were tight.

Had the commutator been assembled according to the specifications laid down by the original manufacturer, with the use of tools which insure high-grade workmanship, the accident would not have happened. The series of articles on commutators by Jesse M. Zimmerman which has been running in the maintenance issues of ELECTRIC RAILWAY JOURNAL gives in detail the practices of one manufacturer. While the practice of leading railway motor manufacturers may differ slightly in minor details, their general manufacturing principles and standards are comparable. By adopting for maintenance operations the methods set forth in this series of articles the number of armature failures should be reduced materially.

What Is a Pull-In?

PULL-IN records are of great value in determining the condition in which a property's equipment is maintained. But a large part of this value is lost unless such records for one property are comparable with those of another. Discussions of this subject have appeared before in the JOURNAL. There is still, however, a wide variation in the definition of a pull-in as applied by various properties. Because of this, comparisons which should serve as a stimulus toward better maintenance practice are frequently very misleading.

There are several classes of pull-ins. Some are chargeable to the mechanical department, others to the transportation department and still others to causes beyond the control of the company. In this latter class come cars disabled by certain types of accidents. A pull-in record, to be of real value, should include a report of every car that is withdrawn from service before completing its scheduled run. With such a broad interpretation as a beginning, the basis for classification may be fixed by definition, so that pull-ins chargeable to the mechanical department for defects in equipment, and to the transportation department for improper operation, may be determined.

After all, the broad purpose of pull-in records is to stimulate avoidable interruptions to passenger service. Only when the records of various properties are on a comparable basis do they serve to stimulate that effort toward improvement from which progress grows. The mechanical man who makes an honest effort to find out how his performance compares with that of other properties would, of course, welcome any step toward uniformity of definition which would increase the value to him of comparative records. The Association of Equipment Men, Southern Properties, has established a set of rules for determining pull-ins, as was outlined in a letter by A. D. McWhorter, its president, in the Jan. 15 issue of the JOURNAL, page 128. This work should be extended. It appears to be a subject which warrants study by the American Electric Railway Engineering and Traffic & Transportation Associations. Once the proper definitions are laid down and followed by member properties, pull-in records will become of much more value than they are under present conditions.

Opposition to One-Man Cars Is Based on Lack of Knowledge

FROM several quarters attacks have been launched recently against the use of the one-man car. Among these Buffalo, Toronto and Montreal are perhaps the most prominent. In practically all cases, in these and other cities as well, the objections raised have been mainly of a political nature. Organized labor has been a factor, although the national officers of the Amalgamated Association are on record in favor of the one-man car as a progressive step and one which will redound to the advantage of the men themselves.

Those who argue against the one-man car do so without knowledge of the facts. Far from being an experiment, it is one of the most striking successes in the transportation business. There is not a state in the Union nor a province in the Dominion of Canada where one-man cars are not used. They have been found successful on the smallest properties and the largest. In the Borough of Manhattan, New York City, one-man cars are giving satisfactory performance at certain times of the day, as well as all day on Sundays. Across the Hudson River the Public Service Railway of New Jersey uses one-man cars exclusively, operating some 1,200 in regular service, many of them through the heart of Newark, one of the largest American cities.

A stock argument against the one-man car is that it increases the accident hazard. That this is incorrect is shown by the record of practically every property that is a user of this type of equipment. The results obtained by a group of properties under a well-known utility management firm is typical. This group of properties covers a wide territorial range, so that local conditions do not enter to any great extent. In the four years 1922-1925, during which the proportion of one-man car-miles increased from 48.7 per cent of the total to 84.6, the passengers carried per person killed or injured went up from 52,000 in the earlier year to 64,000 in the later. The average cost of the accidents has remained practically stationary, going from \$23.63 to \$23.86. What increase there was came from greater seriousness of accidents with two-man cars, as the cost for these went up from an average of \$23.78 to \$28.08, while the cost per accident with one-man cars went down from \$23.78 to \$23.07 in the same period.

As to schedule speed, now that operators are thoroughly familiar with the method, there is little or no difference between one-man and two-man service. In fact, some companies obtain higher schedule speeds with the one-man car, particularly if small numbers of passengers board at one stop, or if the fare system makes it possible to collect all fares outside the congested district. The advantages of lower operating cost and possibilities of more frequent service are so well known that it is not necessary to reiterate them here.

No one thinks of requiring two men to operate the ordinary type of bus. Yet the driver has to do everything the operator of the one-man street car must do, and in addition he has to steer his vehicle in and out of a maze of traffic.

When action is contemplated inimical to the one-man car, it is well that the legislative or regulatory body become familiar with the facts. They are public property, and it is the duty of the public official not only to acquaint himself with them, but to see that he does nothing that will injure or perhaps stifle one of the public's most essential utilities.

Engineering Supervision Over Maintenance Is a Step in Right Direction

SUCH momentum has been gained by the modernization idea of improving the appearance and comfort of cars that it has now covered the entire country. In most instances the approval of the public is evidenced by the increased revenues. This favorable public attitude can only be perpetuated by maintaining reliable and uninterrupted service. Without such continuity of service all the comfort and all the fine appearance will at once lose their appeal. Reliable service cannot be rendered and road failures decreased unless the shop practices are systematized so that the equipment receives thorough inspections and overhauling on a definite basis, which is given at such intervals that failures are anticipated rather than checked up after they have occurred on the road. Appreciating the importance of this situation, the management of the New Orleans Public Service, Inc., reorganized that company's shop organization and placed the most important work under the direct supervision of a field engineer. The results obtained have been most encouraging. The company's 1926 report shows the remarkable average of 261,084 miles per car pull-in due to equipment failures, and a maintenance cost of $20.39 per 1,000 car-miles. A. J. Naquin, this company's engineer of rolling stock and shops, in a paper presented before the Electric Railway Association of Equipment Men, Southern Properties, which was abstracted in the JOURNAL for Feb. 5, explained the manner adopted for overhauling cars on a 40,000-mile basis. The careful attention given the car equipment accounts in large measure for the results obtained. The plan is well worthy of study. The change in shop organization and standardization of practices along engineering lines is a definite step in the right direction.

Good Maintenance Requires Intelligent Supervision

TAKING too much for granted is a disease easily contracted by those who supervise maintenance work. Many companies make an appropriation for maintenance work either as a definite sum or a per cent of gross revenue and it devolves upon those in charge to spend the appropriation. Some mortgages even specify the per cent of gross revenue that must be spent, leaving the quality of the work performed or its effectiveness undefined.

Obviously expenditures poorly supervised or inefficiently made are economically unsound. Moreover, wasteful methods of maintenance may become evident even to the public. Recently a gang of eight track men were observed slowly walking along one of the tracks of an electric railroad in full view of a morning crowd of commuters. Each man except the foreman was armed with a spiking maul, and as the gang proceeded the spikes that had loosened were driven home again. It does not require a technical education to appreciate the fact that time and money were being wasted by this gang employed in the work generally assigned to one, or two men at the most.

Appearing on the same day in the morning papers was one of a series of articles telling of the progress of a rate case by this same company for an application to increase fares. One of the points brought out at the hearing was that the cost of operation had not declined during the post-war years to the same extent as on other roads. This fact was to some extent substantiated in the minds of those commuters who read and think.

Such an incident, although insignificent and perhaps explainable on good grounds, nevertheless leaves an unfortunate impression that may not be as easily eradicated. Public relations depend on performance, and maintenance is a factor in the establishment of good relations fully as important as any function of the service. The quality of the work will affect the upkeep of the property, but the methods used, especially when exposed to public view, are also important in their psychological effect on the patrons served.

Stop-Loss Bus Operation Merely Begs the Paving Question

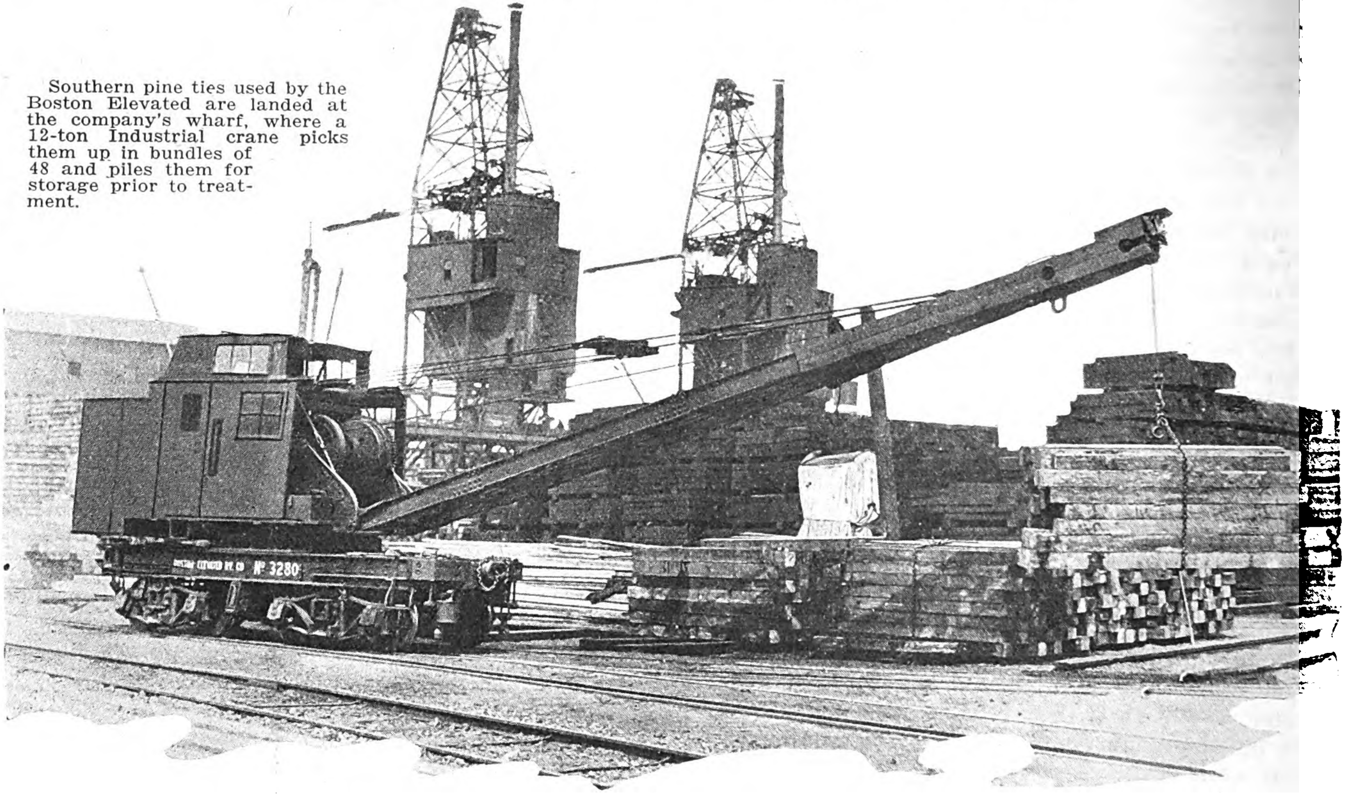
JOY is being expressed by many motorists because the Morris County Traction Company is considering the removal of its tracks from the Newark-Morristown highway and the substitution of bus operation to replace the present car service between Newark and Lake Hopatcong. As soon as the tracks have been taken up it is proposed that the various municipalities through which the line runs replace the worn-out pavement in the track area by smooth new concrete paving.

No doubt such a change would be very agreeable to the motorists, as the present paving is in deplorable condition in many places and the railway is too poor to pay for its replacement. If the municipalities are willing to pay for new concrete paving, as they will have to do if this proposal is carried out, it could be laid just as well with the tracks in place. Last year, however, there was great outcry when the state Senator from Morris County introduced a bill to relieve street railways from their paving obligations. The bill was defeated and the Morris County Traction Company, already in receivership, has had to continue patching pavement worn down by hordes of automobiles and trucks never dreamed of when the obligation was imposed.

A larger question is involved, however, than the mere shifting of the paving burden. Whether or not the bus can provide better transportation than the car on this route appears to have received very little attention. Besides the trackage in paved street, there is considerable mileage on private right-of-way, particularly west of Morristown. In summer the Newark-Morristown-Lake Hopatcong highway carries extremely heavy automobile traffic. Buses certainly could not make as good time under these conditions as do the cars on private way. Before embarking on such a substitution, both the railway and the municipalities would do well to consider experience elsewhere, which has shown clearly that the operation of buses as street cars on rubber tires may serve temporarily as a stop-loss measure, but does not always result in the upbuilding of a satisfactory and prosperous transportation system.

Timber Preservation Saves Money on Boston Elevated System

More than 500,000 Ties Installed Since 1916 on Surface, Subway and Elevated Lines Have Been Treated—Cost Per Tie Per Year Is Estimated to Be 35 Per Cent Less than that of Untreated Ties —Timber for Bridges, Stations, Etc., Also Receives Treatment



Southern pine ties used by the Boston Elevated are landed at the company's wharf, where a 12-ton Industrial crane picks them up in bundles of 48 and piles them for storage prior to treatment.

SINCE 1916 all wood ties used on the surface and rapid transit lines of the Boston Elevated Railway have received preservative treatment before installation. Experience of this company indicates that such treatment practically doubles their useful life. After making allowance for the cost of the treatment, it is estimated that the saving per tie per year is about 35 per cent. Moreover, preservative treatment reduces the original cost of construction by permitting the use of a less expensive grade of timber. Economies have been effected also in the paving account due to less frequent tie renewals. Similar treatment of nearly all other timber used by this company in outdoor construction work has been influential in prolonging its life and reducing maintenance cost.

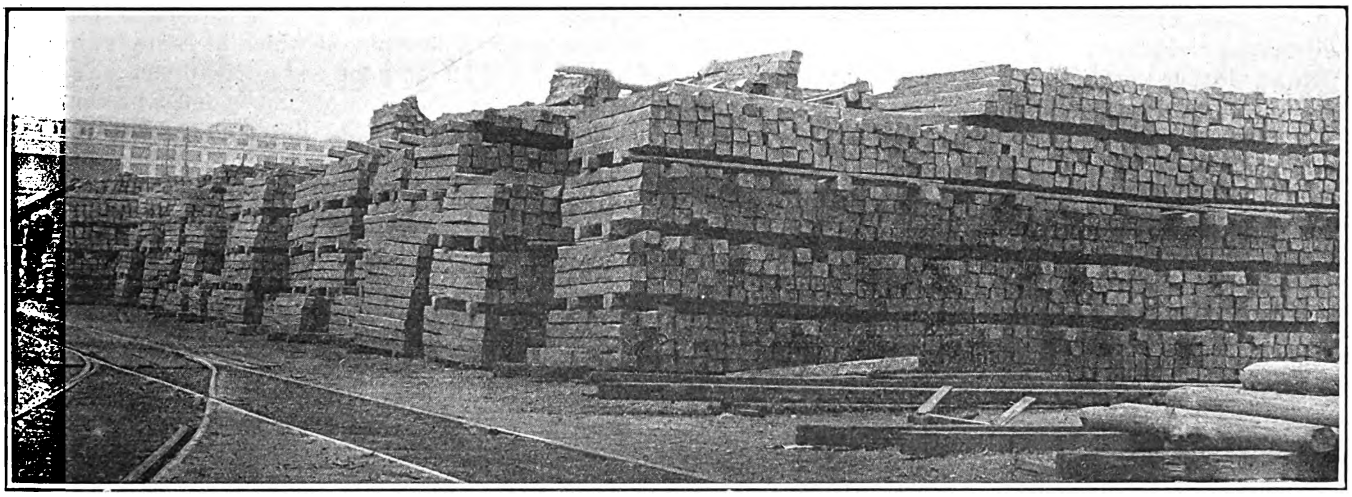
Experience with treated ties on the Boston Elevated began some 25 or 30 years ago. At that time a preparation called "Woodiline" was used in an open tank. Later a preservative known as "Avenarius Carbolineum" was used. While the results achieved by this method and these products were not perfect, they did impress the management with the value of preservative treatment. In November, 1912, the company commenced the use of creosote pressure-treated ties. These were treated by the Bethel full cell process by a commercial creosoting firm. In the early part of August, 1916, operation of the railway's own plant at South Boston was begun. This is equipped to treat timber by the Rueping empty cell, Bethel full cell or open tank processes.

Treated ties are now used in all track, whether paved or in open construction, and also in subways, tunnels and on the elevated structures. No untreated ties have been used since 1916. An average of about 50,000 ties per year have been installed on the surface lines and about 5,000 per year on the rapid transit lines. Altogether more than 500,000 treated ties have been installed, including those laid in 1926, concerning which exact data are not yet available. Figures by years are given in the following table:

TIES INSTALLED ON BOSTON ELEVATED SYSTEM

	Surface Lines	Rapid Transit Lines		Surface Lines	Rapid Transit Lines
1917	54,000	2,878	1923	55,900	4,158
1918	22,500	793	1924	37,284	6,777
1919	81,418	5,079	1925	31,916	7,210
1920	35,324	5,550			
1921	67,782	6,210		449,264	44,557
1922	63,140	5,902	Average	49,918	4,951

Oak and chestnut ties were used on the surface *lines* in 1912 and their use continued until the *opening of* the company's treating plant in 1916. Since then South-



An Average of 50,000 Ties Per Year Used by the Boston Elevated Railway Insures Rapid Movement Through the Timber Treating Plant and Prevents Deterioration Due to Long Storage

ern pine ties have been used except for a brief period during the war when native oak and chestnut were used. Ties on the rapid transit lines have always been hard pine since the opening in 1901. The timber comes from Georgia and Florida by water. Prime grade is used for certain curves on the rapid transit lines, merchantable grade on the remainder of the rapid transit lines and standard on the surface lines.

Hewn ties, 6 in. x 8 in. x 7 ft. 9 in., are used on surface lines except under special trackwork. Sawn ties, 6 in. x 8 in. and 8 ft. to 17 ft. long, are used under special work. On tangent track on the elevated structure ties are sawn 6 in. x 8 in. x 8 ft. 6 in. On the elevated and in the subway under special work ties 7 in. x 8 in., 8 in. x 8 in., 8 in. x 9 in., 8 in. x 10 in., 8 in. x 11 in. and 8 in. x 12 in., ranging from 9 ft. to 17 ft. in length, are used. Bevel ties are used on curves on elevated structures. They vary in size from 6 in. x 8 in. to 7½ in. x 8 in. at the small end and 7⅞ in. x 8 in. to 13¾ in. x 8 in. on the large end. In length they range from 8 ft. 6 in. to 9 ft. 6 in.

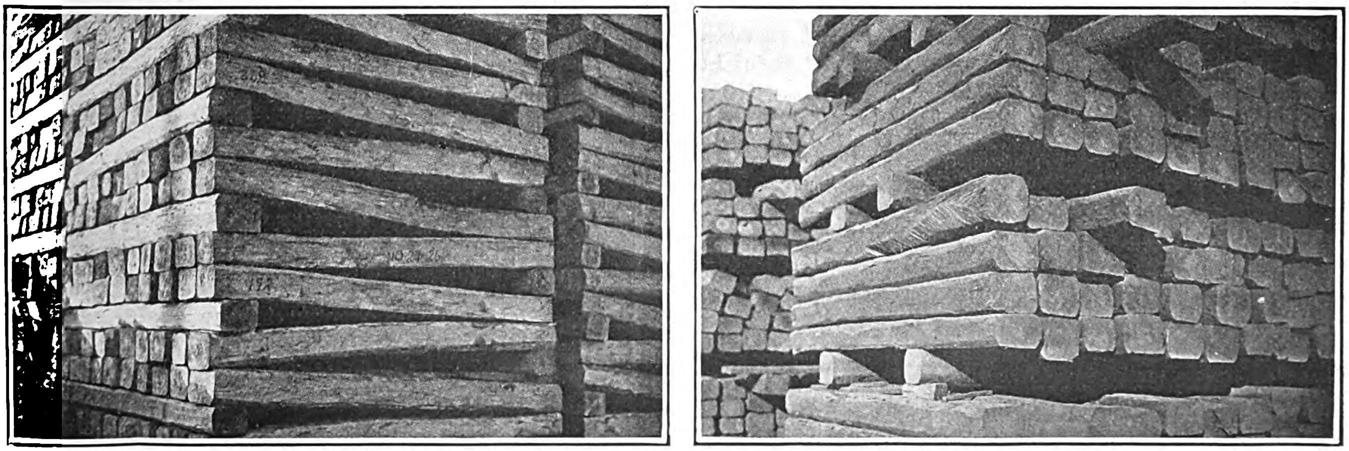
Ties and timber are shipped from the South by steamer. After arrival in Boston harbor they are lightered to the railway wharf, where they are landed f.o.b. They are inspected at the wharf and are piled into sling loads. In the case of 7-ft. 9-in. or 8-ft. ties this means 48 ties are picked up by the crane in one lift and landed at the point of piling. With an Industrial 12-ton crane no difficulty is experienced in handling timber of any dimension.

Grade No. 1 A.E.R.E.A. creosote oil is used for treatment. The oil is delivered in tank cars at a nearby siding. These cars are shifted by the elevated to the storage tanks, where the necessary connections are made. A sample from each tank car is submitted to the railway's chemist for analysis before the car is unloaded. His O.K. must be received before the oil is accepted. Storage for 55,000 gal. of preservative material is provided.

The treating cylinder is of 7 ft. 6 in. diameter and 51 ft. long. Up to Dec. 31, 1925, a total of 454,269 ties and 8,027,554 ft. board measure of lumber had been treated. The entire plant represents an investment of approximately $60,000. Upkeep amounts to about $650 a month.

Operating personnel consists of one supervisor, two engineers, one clerk, one foreman and from ten to 25 laborers as required. Of the two engineers, one is the regular plant operator and the other acts as assistant to the supervisor, but is available for plant operation if a double shift is required or when the regular operating engineer is absent.

In addition to inspecting and directing the treatment of all lumber received at the South Boston plant, the supervisor is charged also with the inspection of all lumber received at other locations on the railway. Reports are furnished to other departments so that they can approve invoices. Lumber from razed buildings on the railway's property is sent to the treating plant for inspection, grading and storage. This is used again



Method of Piling Timber for Storage at South Boston Creosoting Plant. Untreated Ties Are Shown at Left and Treated Ties at Right for purposes to which it is suited, thereby effecting substantial economies.

Hewn ties for the surface lines are adzed before treatment. For this purpose a Greenlee adzing machine has been mounted on an old car which can be moved from point to point. This arrangement has been found to be much more convenient than having the machine in a fixed position. A friction feed on the receiving side allows the ties to be carried to the knives and then dropped to a skid on the leaving side, thence to the treating trucks, with a minimum amount of hand labor. Timber and ties used on the elevated structure are framed at the sawmill after treatment. Certain framing has to be done on the job to fit rivet heads, buckle plates, etc., but in all cases framing done after treatment is protected by a brush coat of creosote. The same precaution is taken after boring holes for bolts, lag screws, etc.

UNIT PILING SYSTEM USED

Before treatment ties are piled according to the one by ten plan, with 224 ties in each bay. Four bays with 896 ties comprise one pile. Four more ties are stored on top to make an even 900 in each pile. The piles are 30 in. apart, allowing proper air seasoning. Illustrations on the preceding page show clearly the methods of piling used for untreated and treated ties.

Treated ties are stored in the open, each lift being two by 40 with five lifts in each bay. The length of the bay depends on the storage area available. As the treated ties move rapidly out of storage, no difficulty is experienced in keeping them in first-class condition. Another advantage of this method of storage is that it follows the principle of unit piling for accounting purposes. When loading ties with a locomotive crane it is easy for the crane helper to force a bar between the bays and drop a chain through, making it possible to pick up 40 ties at one hoist. It has been found necessary to provide employees at the treating plant with cheap canvas gloves to protect their hands. Tie tongs were tried, but did not prove satisfactory. Employees installing freshly treated ties are also provided with gloves.

A gang paving block cutter was installed at the South Boston treating plant in October, 1917. The railway now manufactures its own paving blocks of hard pine, 3 in. x 8 in. and 4 in. x 8 in. This machine makes seven blocks at each cut. The only hand work necessary is to feed timber into the machine. Cut blocks drop into a chute and then go to the treating cages. Sawdust is diverted into a separate chute and lands in a bin where it can be reclaimed.

Dating nails are installed in all ties sent direct to the job from the treating plant. Nails are furnished to division offices which supply ties from other storage points. Ties are shipped to the job in steel dump cars holding 300. For small jobs motor dump trucks holding 60 to 70 ties are used.

As the result of its experience the company estimates the life of untreated ties in pavement without concrete base to be about twelve years and in open track from eight to ten years. It is estimated that treated ties laid in pavement will last at least twenty years and in open track at least fifteen years, although often the useful life of the tie is far in excess of these figures.

Cost of ties varies with the market. Sawn ties cost approximately 26 cents more than hewn ties. At the present time, considering wages, cost of material, etc., the total cost of treating a 6-in. x 8-in. x 8-ft. tie amounts to about 50 cents, of which 21 cents is the cost of handling and 29 cents the cost of treatment. The cost of treatment per cubic foot of timber under present conditions amounts to 11 cents. Based on the first cost per tie of $1.75 and a life of twenty years the cost per treated tie per year would be 8.7 cents. For untreated ties at $1.25 each the cost per year is 13.3 cents. Thus preservative treatment reduces tie cost approximately 35 per cent.

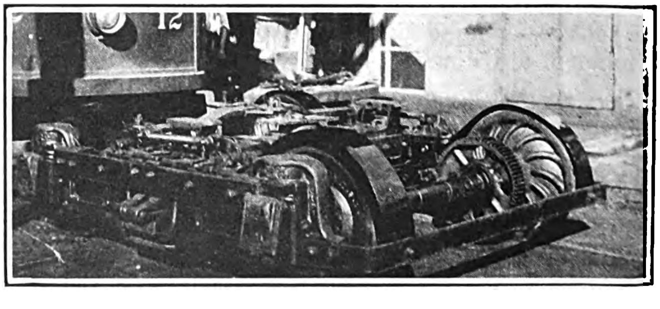
A cheaper grade of timber is now being used by the Boston Elevated for ties and on the elevated structure. Previously it was considered necessary to use only hard timber of first quality. Today standard or merchantable grade timber is used. For surface line tracks in pavement or in the open, the same quality is used. A grade cheaper than merchantable of hard wood, such as beech, birch or maple, may be used if obtainable. Actually the company has found it practically impossible to obtain any hard woods of this description.

No offsetting disadvantages connected with the use of treated ties have been experienced by the Boston Elevated. No difficulties have been experienced with the spikes nor has there been any serious cutting of the ties at the base of the rail. In fact, it is thought that this has been less than with untreated ties.

It has been found that the use of preservative treatment of timber for purposes other than ties on the rapid transit lines increases its life due to a reduction in mechanical wear such as checking or splitting. All timber used for bridge stringers, guard rails, footwalks, cable boxes and miscellaneous purposes on the elevated structures, crossarms, fence posts, pickets, station floor stringers, wharf repairs, piling, block paving, etc., is now being treated before installation. The company is thoroughly convinced that this practice extends its life and lowers maintenance cost.

Wheel Fenders Protect Trucks

FOR the purposes of protecting the electrical equipment and keeping its new cars as clean as possible, the Porto Rico Railway, Light & Power Company, San Juan, P. R., is installing fenders on all trucks for its six new cars now being assembled. The frames for these fenders are made up of ⅛-in. x 1-in. angles bent in semi-circular form and securely bolted to the truck frame. Sheet iron is riveted to the angles, and this has sufficient stiffness to support itself so that no angle is necessary on the inner side of the car wheels.



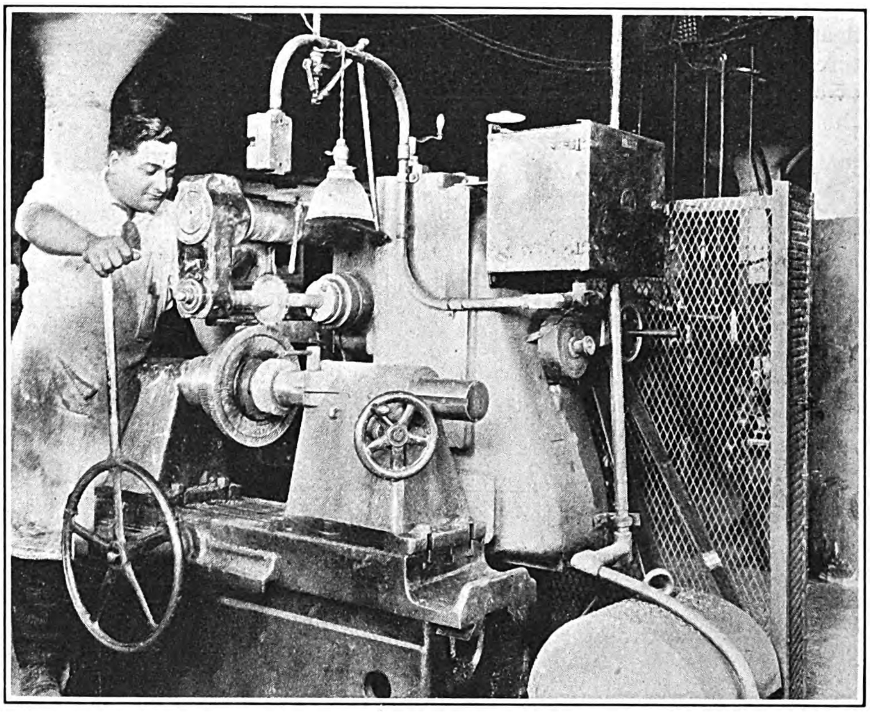
Sheet Iron Fenders Placed Over the Car Wheels Keep Mud and Dirt Off Equipment in San Juan, P. R.

The illustration shows these fenders mounted on one of the trucks. Their use keeps mud and dirt off the equipment and so assists in maintenance of the cars.

Soldering of Railway Motor Commutators*

Satisfactory Methods for Removing the Leads from the Necks of Commutators Preparatory to Rewinding Are Given and Soldering Operations Are Described—Pot Dipping Best When a Large Number of Armatures Are to Be Soldered

By Jesse M. Zimmerman
Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company



Slotting a Westinghouse Type 12-A Commutator Neck

BOTTOM leads of practically all armatures wound with wire coils, and a large proportion of these with single-loop strap coils, may come straight to the commutator necks. With this arrangement it is not necessary to use a filler between the top and bottom leads. However, in order to make a double-loop coil of ribbon wire or insulated strap, which can be wound without forming the bottom leads during the winding operation, it is necessary to bring the leads to the commutator neck at an angle of approximately 45 deg. with respect to the top lead, as shown in an accompanying diagram. A triangular filler must then be placed between the top and bottom leads to take up the space. This filler is kept from sliding back in the slot by bending its front end, *D*, to one side. After the leads are soldered the end of the filler is machined off.

All drifting should be done on the filler in the top of the commutator slot and not directly on the leads. This avoids the nicking of the copper. Swedging of the leads also should be avoided. The bottom lead should lie in the bottom of the slot in the front of the neck only; at the rear of the neck a clearance of ⅛ in. should be left. This is accomplished by making the rear of the slot at least ⅛ in. deeper than necessary to contain the armature leads. The rear mica V-ring should be built up with treated cloth tape 3/16 in. above the bottom of the slot. When the leads are placed in the slot the tape will compress sufficiently to provide a good solid pad for the leads to rest on, thus decreasing the vibration and eliminating the possibility of nicking the bottom lead. Some operators have found it desirable to make a ring of wood to place over the rear V-ring back of the commutator neck to support the leads instead of using treated cloth tape.

In figuring the depth of a commutator slot, two rules are used, one being for the front slot depth and the other for the rear slot depth. The front slot is made the depth of the conductors plus the front depth of the triangular filler between top and bottom leads, if one is used, plus the filler in the top of the slot. The rear slot depth is the depth of the conductors plus the rear depth of the triangular filler between top and bottom leads, plus the filler in the top of the slot, plus ⅛ in. between the bottom of the slot and the bottom lead.

On some types of armatures it has been found necessary to strengthen the leads where they leave the commutator slot, by placing a phosphor bronze sleeve over them. This sleeve supports the leads back of the commutator, eliminating broken leads. The use of these sleeves is confined to ribbon and small strap coils. The thickness of the phosphor bronze sleeve must be added to the depth of the conductors when figuring the slot depth.

It is best to place a filler in the top of the commutator slot. All drifting should be done on this filler and in the front part of the slot, and not directly on the leads. It can be made from the cut-off ends of the conductor. However, in figuring the slot depth ⅛ in. should be the maximum amount to be allowed for the top filler.

Sufficient clearance should be left between the conductor and the side of the slot that the leads may be driven home without crowding and to permit ample room for the solder. In figuring the slot width 0.005 in. is usually added to the width of the conductor for wire coils, and from 0.010 in. to 0.015 in. is added to the width of strap conductors. Whenever a phosphor bronze sleeve is used over the armature lead the allowance should be added to the width of the sleeve and not to the lead.

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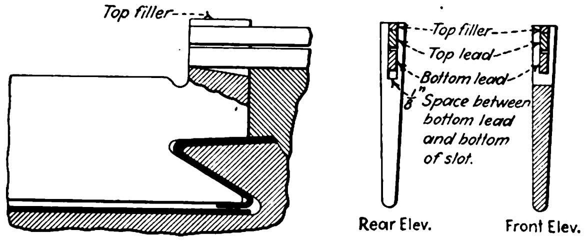
*This is the sixth of a series of articles on commutators appearing in ELECTRIC RAILWAY JOURNAL. The others were "Choosing Materials for Railway Motor Commutator," published Aug. 2, 1926; "Important Considerations in Replacing Commutator Bars," published Oct. 23; "Accurate Machining of the V's of Assembled Commutators Is Essential," published Nov. 20; "Mica V-Rings and Bushings Have Important Functions in Commutators," published Dec. 18, and "Methods and Equipment for Efficient Assembling of Commutators," published Jan. 15, 1927.

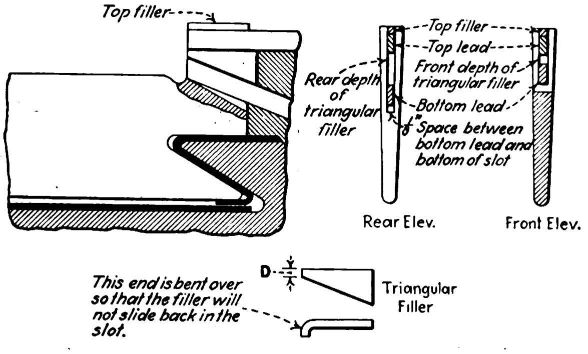
Removing Leads from Commutator Neck

Removing the leads from the soldered commutator neck can be accomplished in four ways, namely, drifting the leads out cold; drifting after softening the solder; breaking the solder with a splitting tool, and remilling the slot. Some repairmen drift the leads from the slot with a gouge without heating the solder. This apparently works out very satisfactorily, though care must be taken so as not to break the side of the neck.

To soften the solder the commutator neck should be heated, preferably with a hot soldering iron. With a torch the commutator neck should not be heated too long at one spot as it will tend to anneal the copper. When the solder has softened the leads can be removed from the slot with a gouge. After the conductors have been removed the soft solder which remains in the slot should be blown out with compressed air. This method can be used to good advantage where the conductors are very small.



Standard Slotting for Commutators

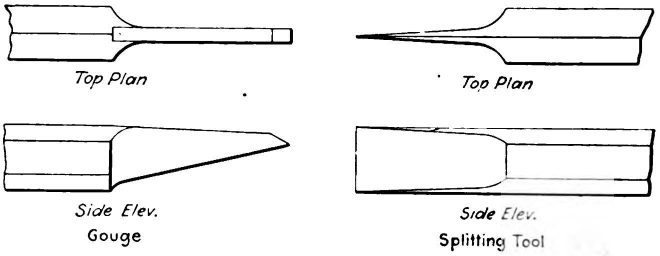

Top filler
Top filler
Top lead
Front depth of triangular filler
Rear depth of triangular filler
Bottom lead
1/8" Space between bottom lead and bottom of slot
Rear Elev.
Front Elev.
D
This end is bent over so that the filler will not slide back in the slot.
Triangular Filler

Commutator Slotted for Special Triangular Filler

The splitting tool used for removing conductors is a chisel which has a wide thin blade. This is driven between the conductor and the side of the slot to break the solder holding it. It must be driven on each side of the conductor, which then can be lifted by the gouge. After the conductors are removed from the first slot the necks will bend over slightly, giving sufficient room to make the operation easy. This method does not work as well as the previous ones in removing small wire. After the leads have been removed the sides of the slot should be cleaned with a thick hacksaw blade or a thin flat file.

If equipment is available to reslot the commutator bars it is convenient to cut off the armature leads behind the neck in a lathe or with a hacksaw and reslot the commutator. This leaves a clean slot in which it is easier to solder the leads. After the commutator neck has been remilled the slots should be coated with a flux of 1½ lb. of resin mixed with a quart of denatured alcohol. This prevents the copper from corroding.

Before discussing the soldering of armature leads it is well to analyze the different types of solder which are available. There are three important phases to consider, namely, cost, ease of working, and ability to hold the metals being soldered. The two first are closely related. The soldering material may be low in first cost, yet if it does not work easily the excess labor which is required will make the total cost of the soldering very high. Cheap solder always contains a large proportion of lead and is difficult to work. In selecting a solder it is necessary to consider the maximum operating temperature of the commutator, as it must withstand this temperature without softening. An accompanying graph shows the melting points of different mixtures of tin and lead solder.

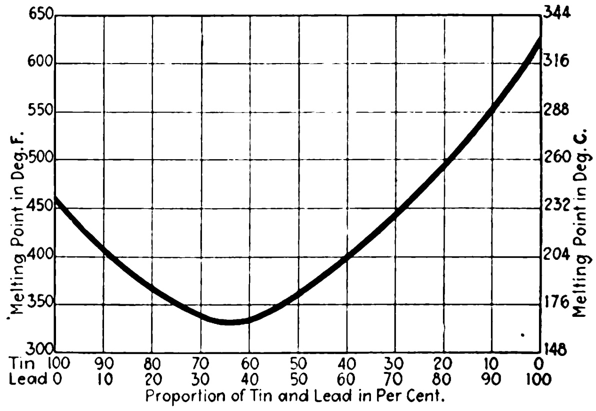


Tools for Removing Armature Leads from Commutator Slots

Solder made from half lead and half tin has a melting point of 181 deg. C. It flows readily and holds the metal firmly as long as the commutator temperature does not become excessive. Besides, it is reasonable in price. Its application is limited mostly to wire-wound armatures.

Pure lead solder has a melting point of 325 deg. C. Although cheaper than half and half solder and having a higher melting point than pure tin it cannot be worked easily. Any solder which has a large proportion of lead is so hard to handle that it is difficult to obtain a good job. Therefore it should not be used.

Where the operating temperatures of the commutator are high pure tin solder should be used. It has a high melting point, 230 deg. C., and when molten it flows easily and rapidly. It tends to spread beyond the surface being soldered, so a skilled workman is needed to handle it properly. The use of pure tin solder is confined to strap and ribbon coils because the clearances between the conductors and the slot are so small that it is necessary to use a very fluid solder. Armatures wound with wire conductors which are worked at high temperatures should be soldered with 85 per cent tin and 15 per cent lead. Extreme care should be taken



Temperature Curve Showing Melting Point of Tin-Lead Solder when using pure tin solder on commutators wound with wire coils in order to prevent it from running through the slot, forming a short circuit back of the commutator.

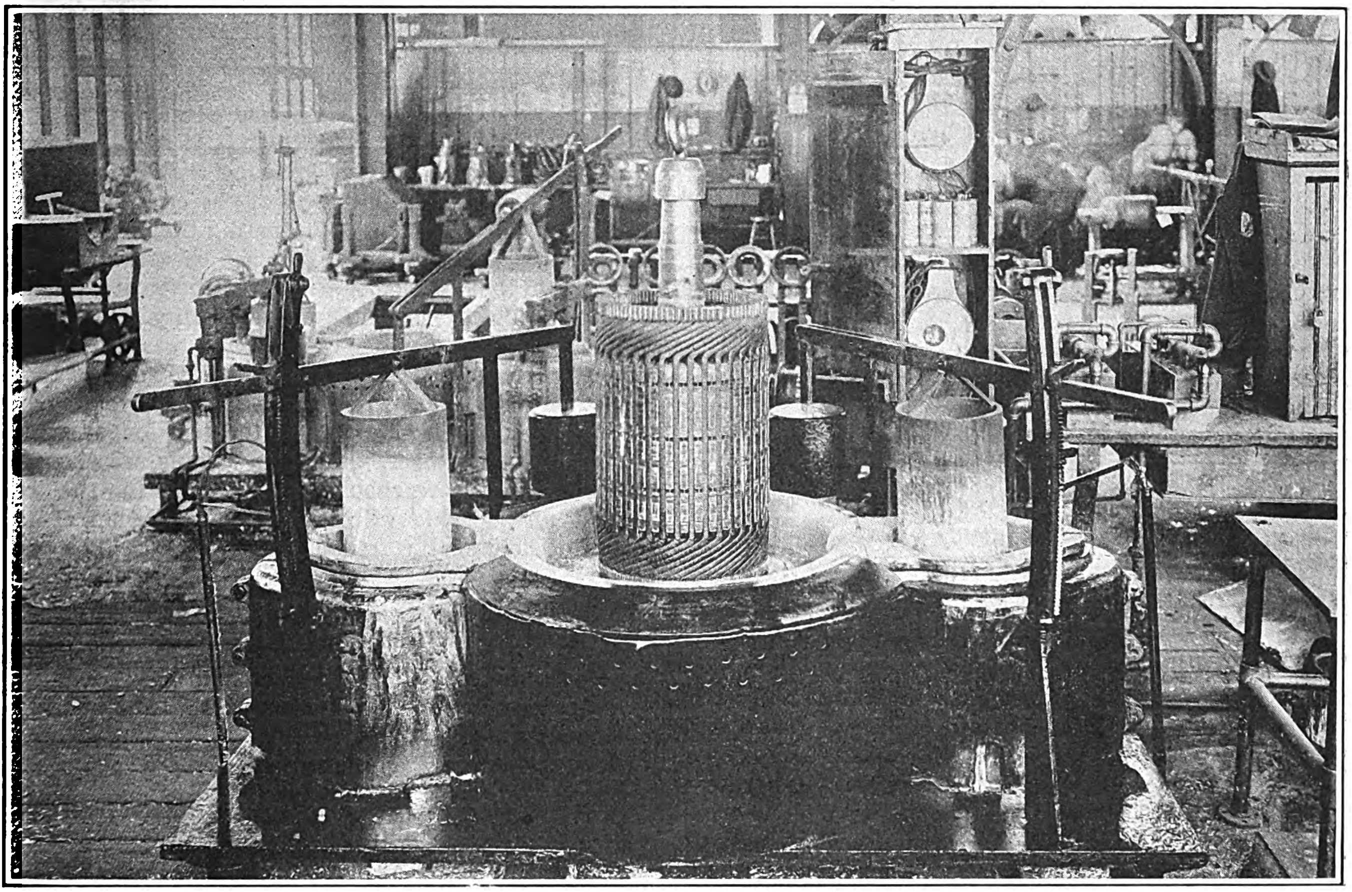
When the commutator is overheated for too long a time while soldering the pure tin will eat its way into the copper parts. It is therefore necessary to watch the temperature and length of time required for the soldering operation when using pure tin.

As soon as the solder begins to soften and throw when the armature is in operation the trouble is usually laid to high commutator temperature. The softening is due to a high temperature of the commutator neck, but not always to high commutator temperature. It is the tendency in some repair shops to take a heavy cut off the front of the commutator neck after the leads have been soldered. This makes the neck narrower, thus cutting down the contact surface. Since in a railway motor each soldered connection in the neck must carry half of the armature current it can readily be seen that if the contact surface is decreased materially the necks will overheat. After the leads have been soldered the machining should remove only the extended leads and as little of the commutator neck as possible.

Flux is a compound which is used to make the solder take hold of the metal. It prevents the formation on the metal surfaces of thin coatings of oxide which hinder the solder from covering the entire surface of the two parts being soldered. It is important to make sure that the flux does not contain acid, as it will destroy the insulation on the armature coil, thus causing a short. An inexpensive flux which will not affect the insulating material can be made by mixing 1½ lb. of resin in a quart of denatured alcohol. It is easier to apply flux in a liquid form.

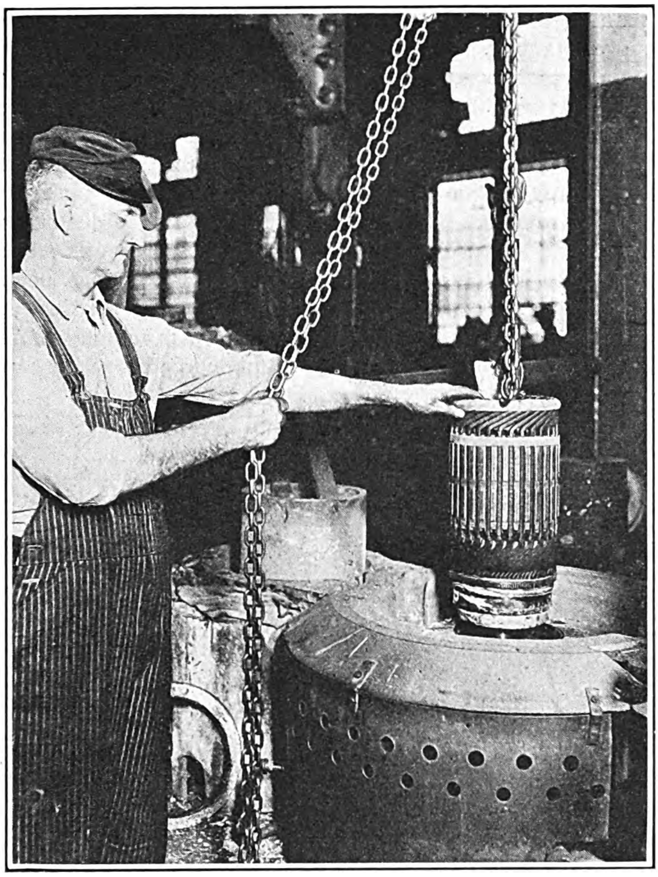
It is not necessary to tin the slots before soldering an armature, if the slots are painted properly with a liquid flux immediately after slotting and the armature leads are tinned well. If the commutator slots are dirty, they can be cleaned with either a heavy hacksaw or a thin file. A few repairmen feel that it is desirable to tin the slots of commutators using strap coils. An investigation has shown that no real benefit has been obtained if the slots are clean and leads properly tinned.

Soldering in the average repair shop is usually done by hand. However, if a large number of armatures are to be soldered, a soldering pot is the most efficient method. Before undertaking to solder the commutator the leads should be tinned well, the slots should be perfectly clean and a coat of flux applied.



Complete Soldering Pot Showing Thermostatic Control

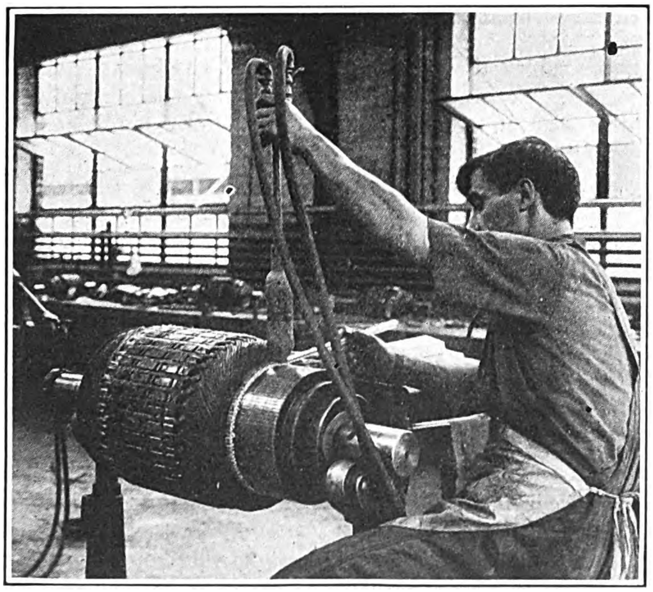
In the illustration, an armature is shown in a soldering pot. The center compartment has an opening large enough to fit the largest commutator. For smaller commutators, rings are used which will fit over the face. The opening between the commutator face and the hole in the ring is closed by wrapping the commutator face with several turns of asbestos rope. This prevents the solder from flowing out of the compartment along the commutator face. The two side pots contain molten solder which is forced into the center pot around the neck of the commutator by lowering the plungers. This solders all the leads at one time, thereby eliminating the danger of overheating the commutator neck. The level of the solder is brought up to the same height as the rear of the commutator neck. With this method the solder cannot work back of the commutator neck



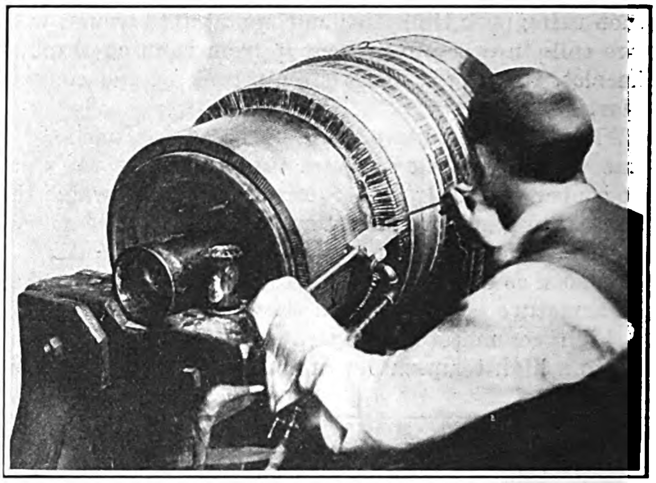
Dipping Armature to Solder Leads

and thus cause a short circuit. After the commutator neck has been immersed for a short time the solder is drained from the center compartment by lifting the plunger. The use of a pot simplifies soldering wire-wound armatures with the 85 per cent tin and 15 per cent lead solder.

In order to prevent short circuits back of the commutator neck, it is necessary to raise the pinion end of the armature high enough that the rear of the slot will be slightly above the front of the slot. This will cause the excess solder to flow to the front of the slot. The soldering can be done either at the top of the commutator or at the side. It is found that by soldering on the side, short circuits back of the commutator are not so likely to occur. By eliminating the possibility of these shorts the repairman will not be afraid to heat the neck so that the solder will cover the entire surface.



Soldering an Armature at the Top with a Self-Heated Iron



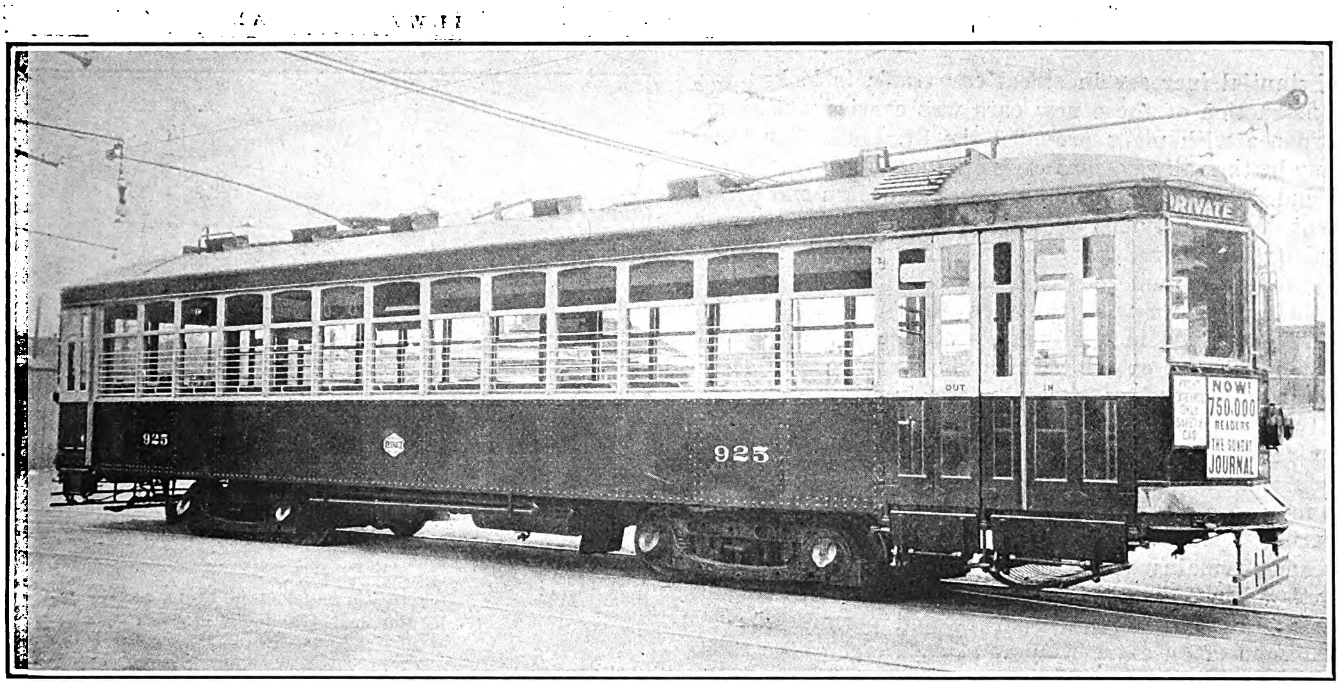
Soldering a Commutator at the Side. The Soldering Iron Is Supported by a Special Rest

Hand soldering is usually done with a copper tool heated in a gas flame. Self-heating gas or electric "irons" are often used but are not as popular as those heated in a gas flame. The irons usually weigh from 2 to 3 lb. Heavy irons will hold the heat longer, which is desirable. However, when heavy irons are used for side soldering there should be a support for the iron to rest upon. This will relieve the workman of the strain of holding the iron during the soldering operation.

Tinning of the iron is very important. When soldering is done on the top of the commutator the whole point of the iron should be well tinned. If the soldering is to be done on the side of the armature with pure tin solder the part of the iron which strikes the copper bar should be clean and tinned perfectly. The lower side of the iron should not be tinned because the molten solder will flow along the bottom of the iron and drop off instead of flowing into the slot.

When soldering large commutators it has been found convenient to apply a gas flame on the iron during the soldering because the leads and core of the large armature will radiate heat from the iron very rapidly. The commutator face should be wrapped with asbestos cloth. The nozzle of the torch is pointed to the front of the commutator and adjusted so that the flame will strike the flat side of the iron.

Before hand soldering, large commutators should be preheated. This is done most conveniently by heating the whole armature in an oven. If an oven is not available the commutator can be heated by rotating the armature while exposing the commutator face to the gas flame. Some armature winders when soldering commutators have a small gas flame strike the commutator face in front of the commutator neck just ahead of the soldering iron. This is bad practice because it is very difficult to adjust the flame so that it will not overheat the commutator face in spots, annealing the copper and causing the commutator face to wear unevenly. The same result can be obtained by making a small electric pad or heater which can be placed against the commutator face to preheat the bars before they are soldered.



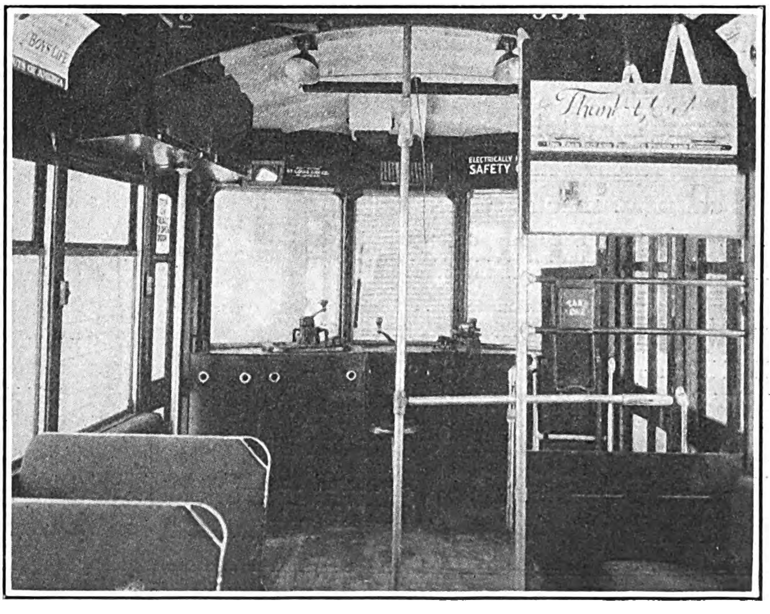
One of 40 New One-Man Cars Built for the Milwaukee Electric Railway & Light Company in the Short Time of 3½ Months. Reduced Width of the Rear Door Gives the Car an Appearance of Added Length

New Cars Selected in Preference to Rebuilding

The Milwaukee Electric Railway & Light Company Has Just Bought 40 New One-Man Cars, Believing that the Operating Economies Possible Will Pay Better than the Rehabilitation of Old Equipment that Later Would Have to Be Discarded

NOTEWORTHY in street railway annals is the recent purchase, building, delivery and assignment to duty on the lines of the Milwaukee Electric Railway & Light Company of 40 one-man cars. This was completed eleven months prior to the date set by the Railroad Commission in an order directing the company to install additional equipment. It is also an illustration of successful co-operation on the part of the car builder in an emergency so that improved city service could be rendered within the shortest possible time. Although the cars were ordered only on Sept. 4, all were in operation by Dec. 30. This is said to set a record in providing street cars in quantity lots.

The first cars arrived on Nov. 22, eight days ahead of the promised delivery date, and the remainder arrived from a few days to more than a week ahead of time. While the building of such a large number of cars requires under ordinary circumstances from six to eight months, in this case the company demanded quick action so that the patrons could have immediate use of the new equipment. The company hopes to effect economies in operation by furnishing the new equipment now instead of providing temporarily rehabilitated equipment that later would have to be discarded in favor of new cars.



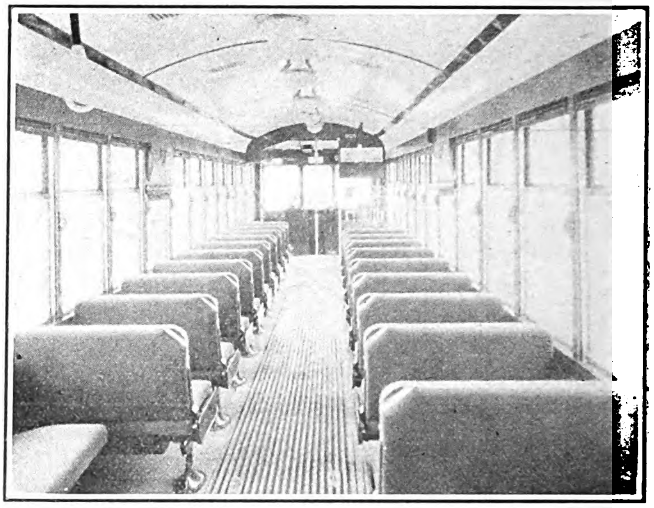
A Feature of the Cars Is the Inclosure of the Piping and Wiring

In general appearance and construction the 900 type car, as the new series is known, is much the same as its predecessor, the 800 type one-man car, which was originally designed by the company's engineers. No effort has been spared to enhance the interior and exterior appearance. With a headway that is at least 20 per cent more frequent than the previous one, a substantial increase in street car traffic is looked for. Construction of these new cars was carried out in accordance with plans provided the St. Louis Car Company by the railway company's engineering staff. These included several important changes in design and equipment from previous types. Interior improvements which have a parallel application in automobile construction are more numerous than the exterior changes. This is in accordance with the view that the rider is far more interested in the inside accommodations than in a finely finished exterior which may have been provided at the expense of an attractive and inviting interior.

Unlike the preceding model the new cars are arranged for front entrance only. Elimination of the doors at each end for operation by a conductor has a tendency to make the car appear longer as well as to add to the seating capacity. Only a small exit door, operated by a treadle, remains at the rear, and it has been moved farther back. The change in platform design provides seats for four more passengers and permits the installation of an extra window at each end where there formerly was a door. The new cars have a seating capacity of 55.

A pleasing feature of the new car which attracts the eye of the rider immediately on boarding is the clean-cut appearance. This is largely the result of the introduction of a new control cabinet arrangement. The entire control equipment is incased in brown enameled sheet metal, concealing the compressed air pipes and other devices ordinarily visible on the platform. Besides improving the appearance, this arrangement allows the platform to be cleaned thoroughly, which was impossible with many exposed pipes. Now only two pipes and the foot valve are exposed. This is done to make a recess or opening in the center of the cabinet so that the operator can bend his knees when in a sitting position.

An improvement in the control which was developed as an added precaution against accidents provides an automatic interlocking of the air brakes with the treadle door so that should a passenger stand on the treadle ready to alight and the operator release the air, the brakes would still remain set until the passenger alighted, after which the treadle would unlock the valve.



The Interior Is Attractively Finished in Light Cherry Trim, Set Off by Polished Aluminum Fittings

Another important interior improvement which has attracted much favorable comment is a radical change in the lighting equipment. Instead of the old type 23-watt lamps mounted in sockets on a molding above the seats, six large attractive center fixtures of the semi-direct type are equipped with two 61-watt non-glare lamps each. These units are hung from the center of the ceiling, throwing a much brighter light, but without discomfort to the eyes. This arrangement also increases the clean-cut appearance of the interior. The lighting fixtures were developed by the Milwaukee company. Consequently all overhead lighting equipment was shipped to the builder for installation. Other changes in lighting include the use of two lamps on each platform instead of the customary three. Increased platform illumination is provided, however, by using 61-watt lamps instead of 23-watt.

Aluminum is used for grab handles on the seats and for vertical stanchions, taking the place of brass or white enameled metal. The seat covering is Kemi-suede placed over rattan. Like other interior parts of the car the dark gray seat coverings can be cleaned with soap and water. When worn out they can be replaced quickly with new covering.

A new type signal button has been installed. This is an improvement over the old type because of less difficulty experienced in locating trouble with contacts installed inside the posts. With the entire button mechanism outside the posts little difficulty is had in examining and repairing them.

An electric heater is placed below each seat. The temperature is automatically regulated by a thermostat. Curtains are the National Lock Washer type covered with double-faced Pantasote. Two rear-view mirrors are on each platform, one directly above the operator's head and the other in the front left-hand corner. During daylight hours the operator can watch the treadle door

GENERAL SPECIFICATIONS OF MILWAUKEE ONE-MAN CARS

Weight, total	33,200 lb.
Bolster centers, length	20 ft. 9 in.
Length over all	45 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 7⅝ in.
Height, rail to trolley base	11 ft. 4 in.
Body	Steel, wood roof
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Safety Car Devices Co.
Armature bearings	Plain
Axles	Heat treated carbon steel
Bumpers	Channel
Car signal system	High voltage
Car trimmings	Bronze
Center and side bearings	Oil lubricated center, plain side
Compressors	DH16
Conduits and junction boxes	Steel
Control	K-35 JJ
Curtain fixtures	National Lock Washers, spring plug
Curtain material	Double faced Pantasote
Destination signs	St. Louis
Door-operating mechanism	National Pneumatic treadle rear exit and T. M., E. R. & L. Co. standard
Energy saving device	Economy meter
Fare boxes	T. M. E. R. & L. Co.
Wheelguards	T. M. E. R. & L. Co. standard
Gears and pinions	Grade M, 30 sets Grade B non-resonant, 10 sets
Heater equipment	Railway Utility
Headlights	O. B. Golden Ray Reflector
Journal bearings	Plain
Journal boxes	St. Louis
Lightning arresters	M-D
Motors	Four GE-264-A, inside hung
Paint	Glidden railway enamel, 20 cars; R. F. Johnston railway enamel, 20 cars
Safety devices	Safety Car Devices Co.
Sanders	St. Louis air operated
Sash fixtures	Edwards wedge lock
Seats	St. Louis
Seating material	Kemi-suede over rattan
Slack adjuster	Non-automatic turnbuckle
Springs	Elliptic bolster and coil for equalizers
Step treads	Kass
Trolley catchers	Ideal
Trolley base	U. S. 13-E
Trolley wheels	6-in. diameter
Trucks	St. Louis E1, B64
Ventilators	Peerless
Wheels	Steel, 26-in.

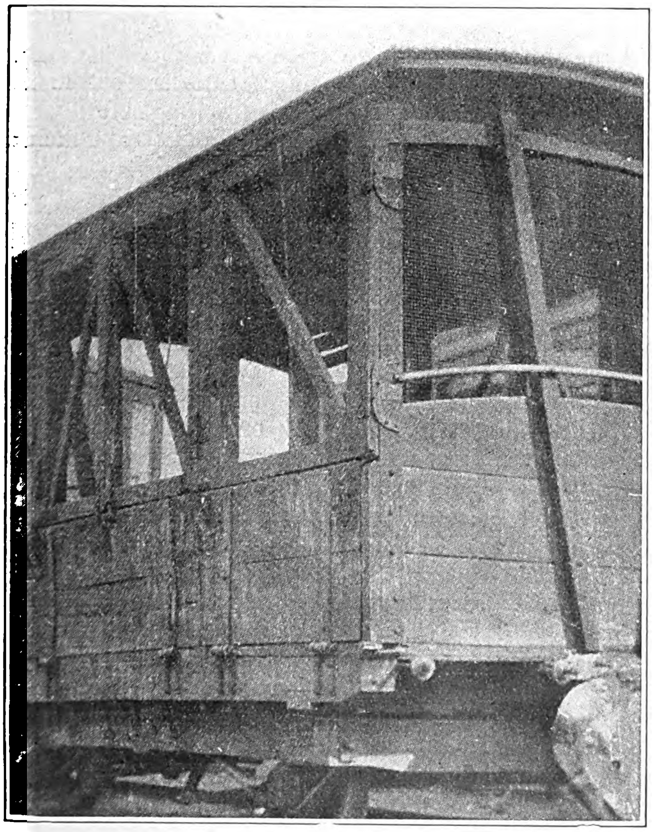
with either mirror. At night when the back curtain is brought into use the center mirror is obscured and observation of the rear is accomplished by means of the extra side mirror. All switches are centralized and inclosed in two cabinets, one on each platform. These are finished in a light cherry stain which lends attractiveness to the interior.

A new type of truck has been introduced which possesses better spring suspension and easier riding qualities. For propulsion four GE-264-A motors are used, together with St. Louis E-1 B-64 cast steel trucks with equalizing springs and auxiliary light-load bolster springs.

The Milwaukee company painted these cars in a special color scheme so that they can be distinguished readily from others on the system by waiting passengers. With the entrance at the front this is quite desirable. The new cars are finished in deep orange on the side panels up to the belt rail and on the letterboard. Sash rests and window posts are ivory and the bands of color are carried across the doors and around the ends of the car to give a streamline effect. The interior is also pleasingly bright, being cheerfully finished with light cherry wood trim that is set off by the polished aluminum fittings.

Screened Refuse Car

CONSIDERABLE trouble having been experienced by the York Railways, York, Pa., from the blowing about of light refuse material during its transportation from the shop to its disposal point, E. L. Greene, master mechanic, designed and constructed a refuse car to obviate this objectionable feature. This car is a single-truck trailer, with heavy yellow-pine underframing, braced and reinforced by cross and vertical oak timbers, all being securely bolted together. It is of semi-closed construction, the closed portion extending above the floor about 3 ft. and the remainder being screened by a wire screen having about ½ in. mesh.



Refuse Car Has Hinged Section of Solid and Screened Parts

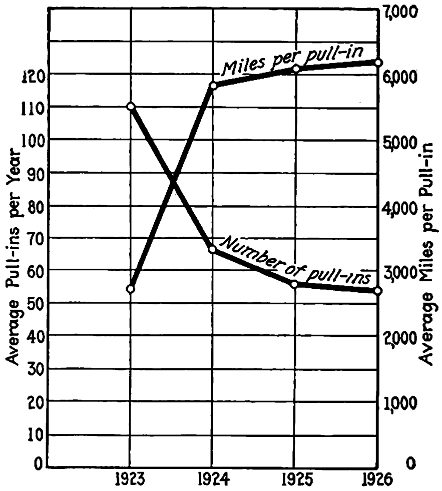
The solid and screened portions of the sides of the car are divided into sections and heavily hinged to permit the opening of the entire side, thus facilitating loading and unloading. Heretofore refuse material was deposited in an open bin in the vicinity of the shop, then loaded and transported on open cars or trucks to the refuse dump. With a reasonably strong wind blowing or the car running at a fair rate of speed considerable of the light refuse was blown to the street.

Now all refuse is deposited directly in the car, thus saving double handling and eliminating the disagreeable feature of light particles being blown to the surrounding highways during transportation.

Maintenance Cost Reduced at Harrisburg

Introduction of Rigid Inspection System, Making Minor Repairs on the Road, Not Filling Vacated Positions Has Improved Operation and Effected a Substantial Saving

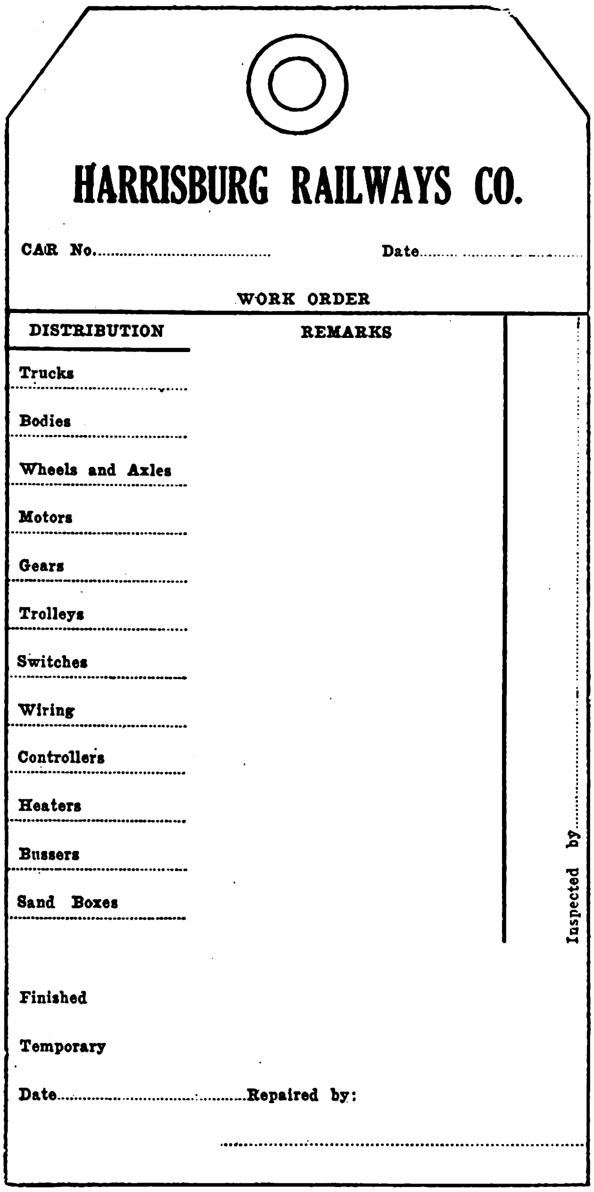
EARLY in 1924 the management of the Harrisburg Railways, Harrisburg, Pa., initiated an intensive analytical study of the methods and practices followed in the maintenance of the company's car equipments for the purpose of determining wherein maintenance costs and car defects could be decreased. All departments and sections of departments were investigated carefully as regards the work being performed, the method of accomplishment and speed of production. This resulted in several changes being made in the centralization of production and shop practices and which had an extremely beneficial effect in the reduction of maintenance costs. The four outstanding changes consisted of:



Graphs Showing Decrease in Pull-ins and Increase in Mileage per Pull-in of the Harrisburg Railways. (The Last Three Months of 1926 Are Estimated)

1. Introduction of a more rigid inspection system and means of placing responsibility.
2. Making all minor equipment failure repairs at Market Square.
3. Discarding oil rear lamps and substitution of electric.
4. Leaving labor vacancies unfilled where possible.

It had been the practice for the inspection organization to make inspections and repairs and return the



HARRISBURG RAILWAYS CO.

CAR No.. Date..............................

WORK ORDER

DISTRIBUTION	REMARKS
Trucks	
Bodies	
Wheels and Axles	
Motors	
Gears	
Trolleys	
Switches	
Wiring	
Controllers	
Heaters	
Bussers	
Sand Boxes	

Inspected by.........................

Finished

Temporary

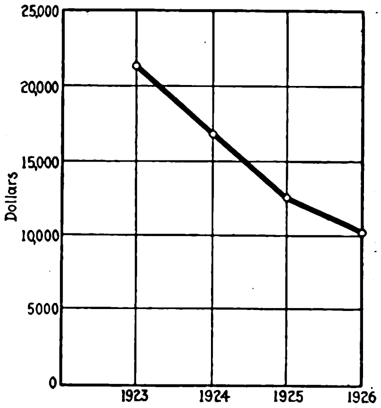
Date.......................................Repaired by:

....

Adoption of this Inspection Tag by Harrisburg Railways Has Resulted in a Better Analysis of Maintenance Costs

car to service without completely recording the findings of the inspection or the nature of the repairs. As a result when a road failure of the equipment developed it was very difficult to obtain sufficient history of the defective piece of apparatus to place the responsibility accurately. To obviate this condition an inspection tag was designed covering all inspection operations which is attached to the car upon its arrival in the shop for inspection. The inspectors are required to note on this card the condition of the various parts of the equipment together with the nature of the repairs made. This tag, bearing the signature of the inspector is filed in the master mechanic's office and provides a permanent record of the inspection, repairs and responsibility for every car going through the inspection process. This tag has been the means of creating a feeling of responsibility among the inspectors and has resulted in more efficient and satisfactory work being performed, with a marked reduction in road failures.

The physical layout of the system with regard to the main traffic arteries is such that if the transportation crews were required to return defective cars to the carhouses serious service interruptions would occur. It had therefore been the practice to utilize two carhouse men for the replacement of a defective car with a good operating one. This replacement generally took place at Market Square, which is the terminal for all lines. As a result of this method the services of these two men for shop production purposes were lost during the greater part of the working day.



Electrical Maintenance Costs Have Decreased Each Year Since the Adoption of the New Method. (The Last Three Months of 1926 Are Estimated)

A careful check of the road failures showed that 95 per cent of them were of a very minor nature and could have been repaired on the road, saving the shifting expense. Therefore a capable man was placed in Market Square, whose duties were to make all repairs possible without interrupting service, and the services of the shifting crew were dispensed with. This change has been the means of reducing greatly the pull-ins and labor expense for maintenance, as well as obtaining appreciation from the operating men and the public.

SUMMARY OF AVERAGE PULL-INS PER YEAR, AVERAGE MILEAGE PER PULL-IN AND ELECTRICAL MAINTENANCE LABOR COST ,HARRISBURG RAILWAYS

Year	Pull-ins Average per Year	Average Mileage per Pull-in	Electrical Maintenance Labor Cost per Year
1923...............	110	2,700	$21,322.62
1924...............	66	5,773	16,805.86
1925...............	56	6,044	12,518.18
1926...............	54	6,220	11,204.48

(Nine months actual)
(Three months estimated)

Basic schedule........................... 50 cars
Peak schedule........................... 90 cars

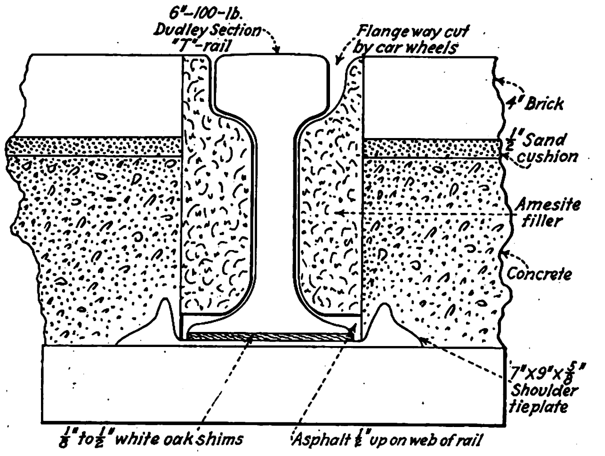
Rear end protection by means of oil lamps was found to be very expensive from a maintenance point of view, since it required the continuous services of two men to gather, distribute and trim these lamps. A careful balance of the cost of a new electric rear end lamp installation and its maintenance against that of the oil light system showed that the cost of the new installation could soon be paid for by the saving effected in maintenance. As a result all cars were equipped with electric rear lamps. As the work progressed the oil lamp maintenance gang was decreased until the maximum of saving in maintenance was procured.

Where possible, vacancies caused by dismissal or resignation have not been filled. A part of the wages saved is utilized in salary increases for the remaining men and the balance is credited against maintenance saving. These increases have been received by the men with great appreciation and have acted as a stimulus for greater effort. As a result the production has not been reduced due to the loss of man power.

Adoption of numerous changes in methods and procedure throughout the shop, especially those enumerated above, has been a means of reducing the electrical maintenance labor costs 47 per cent and increasing the average mileage per pull-in 230 per cent.

Correcting Rail Alignment and Repaving

EARLY in 1913 new rails were laid by the Erie Railways, Erie, Pa., on State Street between Sixth and Fourteenth Streets. A standard 6-in. steel rail weighing 100 lb. was laid on wood ties with steel shoulder tie plates and screw spikes, all being imbedded in solid concrete. This rigid construction, together with the heavy traffic, finally caused rail joint flexion which radiated the entire length of the rail. This resulted in wear on spikes and tie plates and a general loosening of the rails.


6"-100-lb. Dudley Section "T"-rail
Flangeway cut by car wheels
4" Brick
½" Sand cushion
Amesite filler
Concrete
7"x9"x⅝" Shoulder tieplate
⅛" to ½" white oak shims
Asphalt ½" up on web of rail

Sketch Showing Method for Shimming Rails, Installing Paving and Applying Filler

This condition was discovered in the spring of 1926. It was found that the rails were very loose in some places and would require immediate attention. A careful examination and calibration of the rail and the pavement away from the rail showed both to be in such good condition that a new construction job was not warranted. Various schemes were considered for the realignment and tightening of these rails. A method was finally adopted which after eight months service has been found satisfactory.

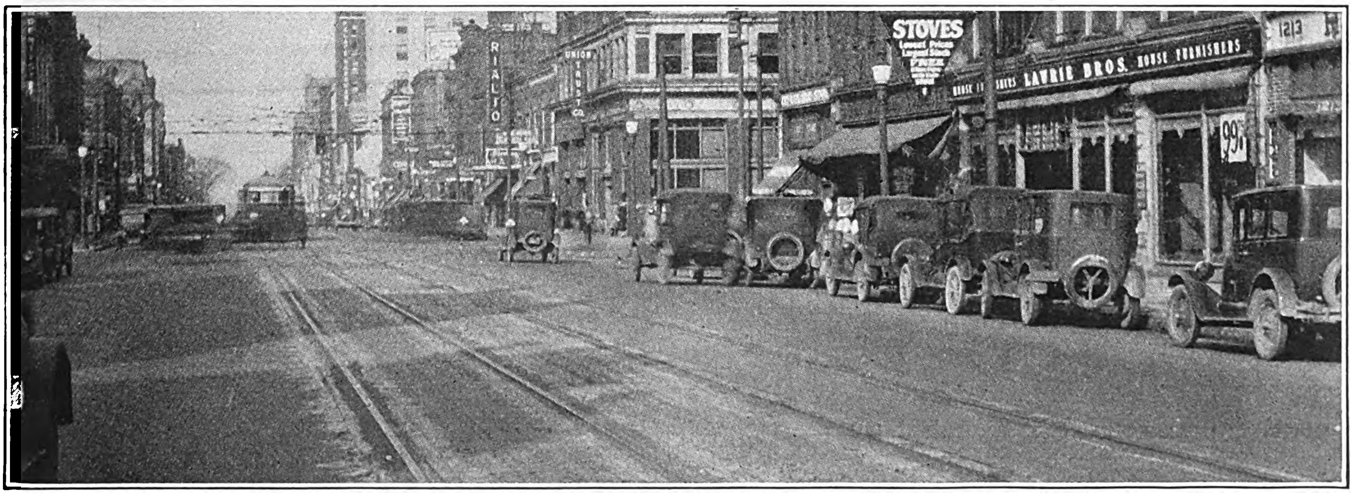
The pavement was opened adjacent to the rails and excavation made to the top of the tie. After the rail was brought up to grade the gap between rail and shoulder plate was filled with white oak shims, varying in thickness from ⅛ in. to ½ in., and the rails spiked. A wooden form was set up on the edge of the rail base of such a height as to permit laying 4-in. brick to grade on a ½-in. sand cushion and this form was filled with concrete. Removal of the form left the base of the rail exposed. When the concrete was set thoroughly, hot asphalt was poured around the base of the rail and up ½ in. on the web. On top of the concrete 4-in. brick on a ½-in. sand cushion was laid 3 in. back from the rail on the gage side and 2 in. back from the rail on the outside. The space between was tamped tightly with Amesite flush with the top of the rail, the flangeway being cut by the car wheels. The surface was then rolled and hot pitch asphalt poured over the entire surface to fill any existing voids. At the expiration of about a week or ten days, an examination was made. Where settlement had occurred hot asphalt was again poured into the depressions and on top of this was tamped and rolled a Tarvia mixture with considerable small aggregate and sand content.

While this method of realignment of rails and adjacent paving is purely experimental great hopes are expressed that it will prove a success, and if so it will be of material assistance to the maintenance man where rails are too good to scrap and the pavement has several more years of life.

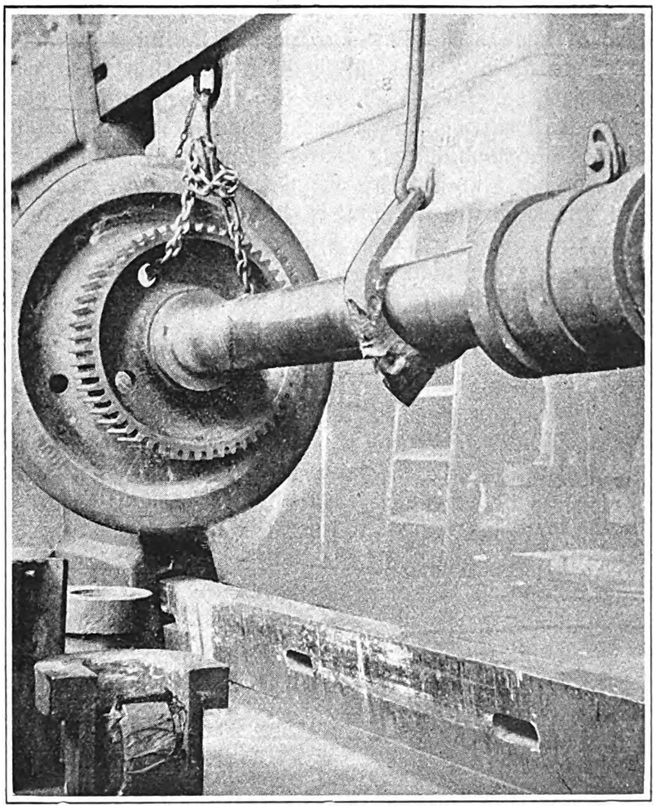
Wheels Removed and Pressed On Economically

PRESSING on and removing of wheels, together with the keeping of accurate wheel and axle records, is being given very careful attention in the shop of the Wilkes-Barre & Hazleton Railway, Hazleton, Pa. Where it is necessary to remove a worn-out wheel it has been found good practice to burn the wheel radially to within ¼ in. of the axle by means of an acetylene torch. By driving a wedge into the slot at the tread or by applying a slight pressure the seal is broken and the wheel is removed easily. This method has been found very economical due to the rapidity with which it can be carried out.

In pressing on wheels the danger of shaft distortion, so generally encountered by the usual pressing methods, has been overcome by the use of a specially designed thrust cylinder and mandrel. The cylinder is made of steel about 13½ in. long and 9½ in. outside diameter bored to fit snugly over the wheel fit, with the end pressing



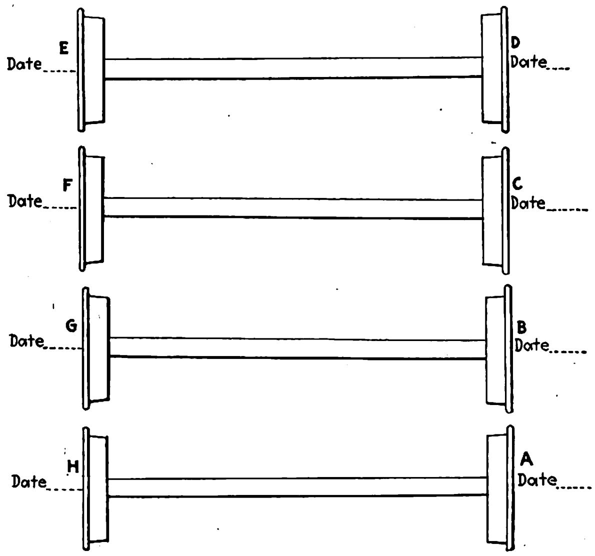
General Appearance of Rails and Pavement on State Street, Erie, Pa., Where Experimental Paving Method Has Been Installed



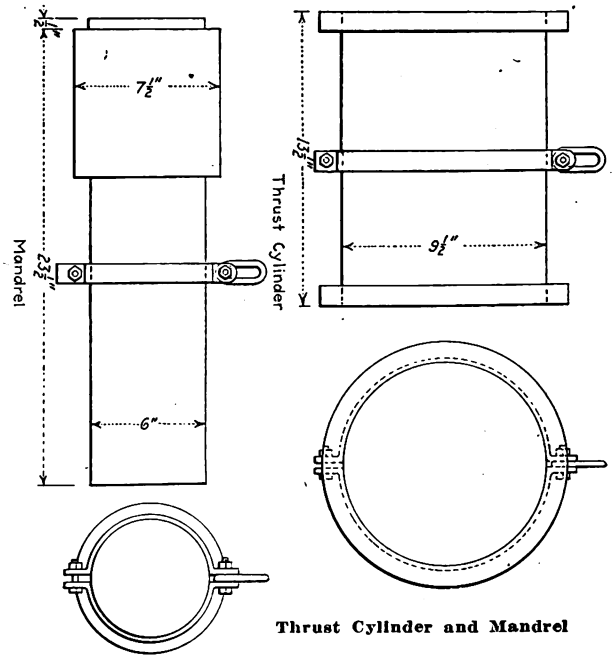
Wheel Being Pressed on with Thrust Cylinder and Mandrel

perfectly against the wheel seat. The mandrel is of steel about 24 in. long, 6 in. diameter at the small end and 7½ in. diameter at the large end. A ½-in. x 6-in. projection extends from the large end fitting the bore of the cylinder. This projection does not touch the end of the axle.

To press on a wheel the thrust cylinder is placed on the wheel fit with its face pressing against the wheel seat. The mandrel is next put on with the projection entered in the cylinder bore and the other end against the press ram. With this equipment the entire pressure is exerted against the wheel seat, thus eliminating the danger of shaft distortion due to shaft end pressure. This apparatus has proved very satisfactory and since its adoption not a single case of a distorted shaft has occurred.



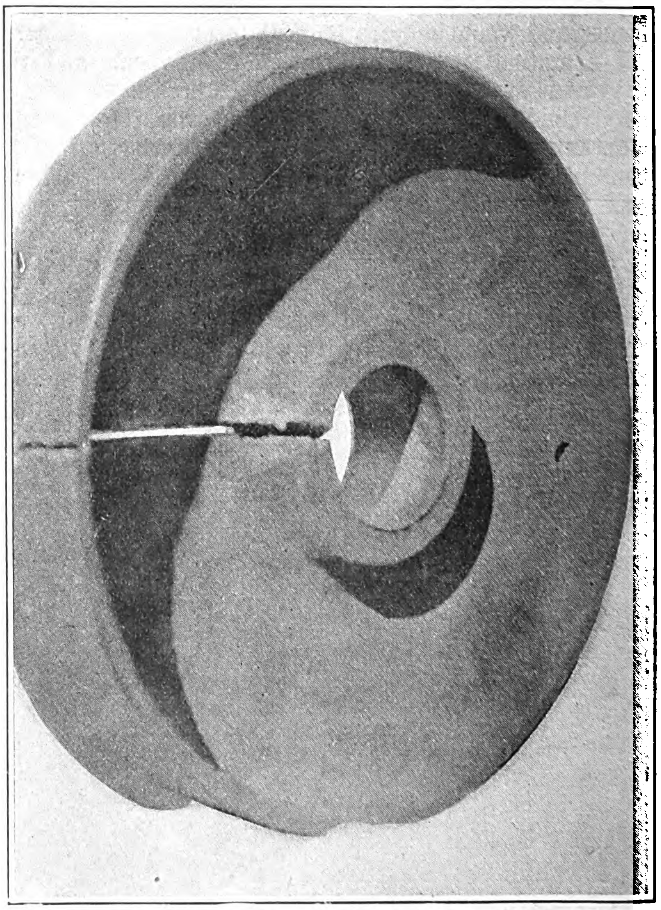
Wheel and Axle Record Stamping



Thrust Cylinder and Mandrel

The press used is of 400 tons capacity with a 25-ton release. All 36-in. wheels are bored 7 in. and are pressed on at a pressure of 75 tons. The pressure used for each wheel is kept on a recording gage chart and filed systematically for ready reference.

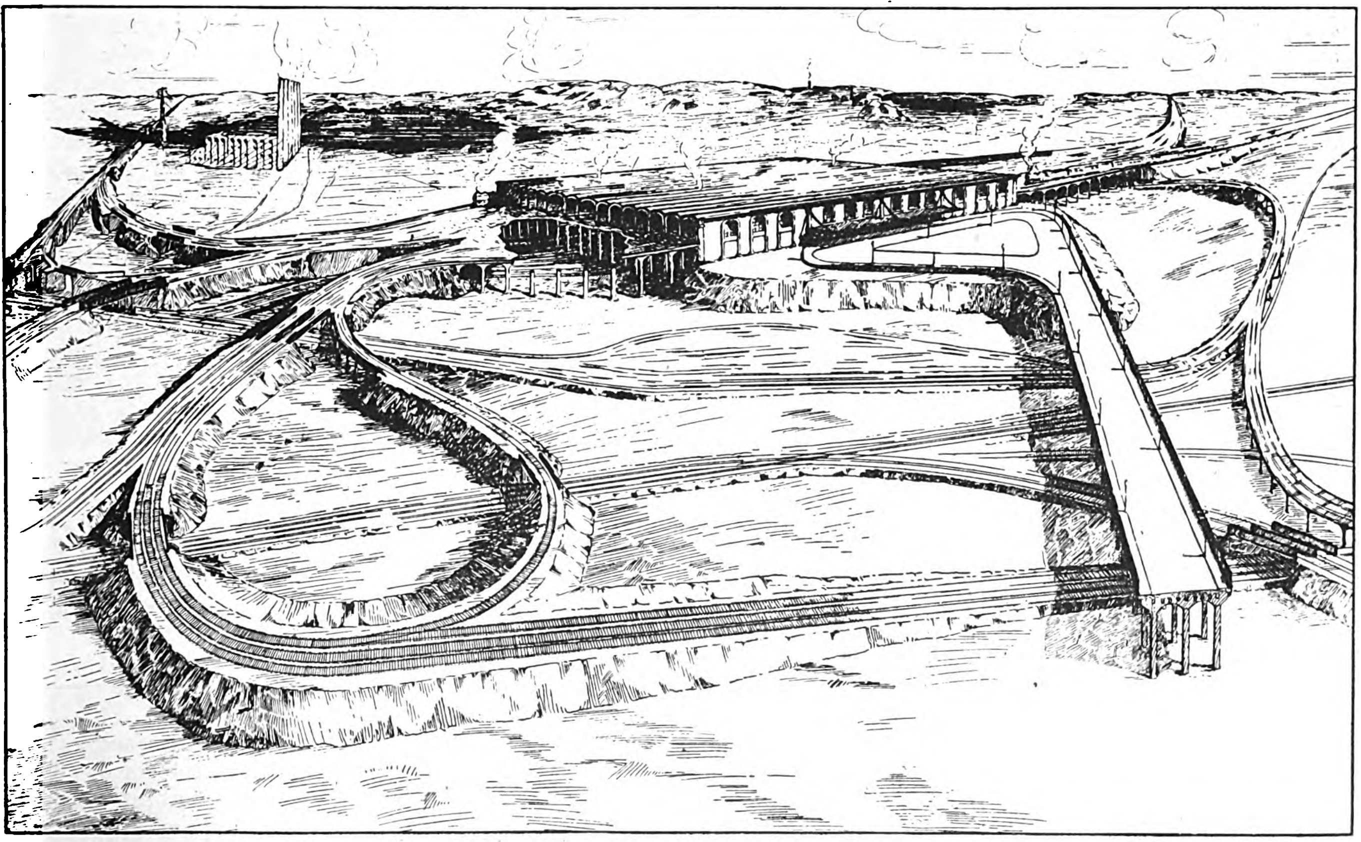
Each wheel of a car, together with the end of each axle, is lettered consecutively from A to H, along with the date it was pressed on. This record is suitably filed so that complete information on any wheel or axle is obtainable when desired.



36-In. Wheel Removed from Axle by Burning with Acetylene

New Plans for North Jersey Transit

Studies Made by North Jersey Transit Commission Embrace a Loop Line Between Manhattan Borough, New York, and the Steam Railroads Serving New Jersey Communities—Alternate Plans Provide for Various Contingencies—Many Differences from Proposals of Former Commission



Perspective of Proposed Meadows Transfer Station Near the Present Croxton Yard of the Erie Railroad

MARKED efforts toward elimination of former physical objections and definite recommendations for the speedy realization of the interstate rapid transit loop are features of the new report of the North Jersey Rapid Transit Commission, which was presented to Governor A. Harry Moore on Feb. 14. This report, prepared under the direction of Chairman Daniel A. Garber, follows an earlier report presented in 1926, and which gave somewhat similar recommendations although not in such complete form.

In order to obtain definiteness and clarity the report is presented in three major sections: Status of the physical plan, prepared by Glenn C. Reeves, assistant chief engineer, and Daniel L. Turner, consulting engineer; studies in means of financing, prepared by Philip H. Cornick, specialist in taxes and assessments, and opinion of counsel relative to district organization, prepared by Spaulding Frazer, counsel.

While the basic plan is the same as that reviewed in ELECTRIC RAILWAY JOURNAL for Feb. 6, 1926, page 239,[*] the commission, during the five months at its disposal, has by exhaustive studies broadened the entire scope of the project and developed several new features of outstanding importance. In addition, it has apparently established an *entente cordiale* not only with the managements of the steam roads entering New York but with the transit officials of New York City.

Briefly the new features are: (1) A transfer station at Journal Square, Jersey City. (2) Physical connections with the New York City Board of Transportation's Eighth Avenue subway and various changes in the 1926 plans for physical connections with the downtown subways. (3) A transfer station at New Durham, N. J. (4) Definite plans for extending the B.-M.T. Fourteenth Street-Eastern subway to Meadows Transfer Station. (5) Definite plans for extending the Interborough Rapid Transit 41st Street subway to connect with the New Durham Transfer Station. (6) An

ONE-WAY COMMUTER TRAFFIC ON NEW JERSEY STEAM RAILROADS FOR A TYPICAL DAY

	Excluding Passengers	H. & M. Per Cent	Including Passengers	H. & M. Per Cent
B. & O.	550	0.36	550	0.18
Central Railroad of New Jersey	28,106	18.59	28,106	9.12
Delaware, Lackwanna & Western	34,296	22.68	34,296	11.13
Erie	50,337	33.29	50,337	16.33
Hudson & Manhattan	......	......	156,986	50.94
Lehigh	980	0.65	980	0.32
New York, Ontario & Western	338	0.22	338	0.11
Pennsylvania	24,248	16.04	24,248	7.87
West Shore	12,351	8.17	12,351	4.00
Total	151,206	100.00	308,192	100.00

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[*] See also ELECTRIC RAILWAY JOURNAL, Feb. 7, 1925, page 222; Jan. 30, 1926, page 210; March 13, 1926, pages 444, 447 and 449; April 10, 1926, page 639.

independent subway through Manhattan in conjunction with the authorities of Westchester County, New York.

These new plans are predicated on a detailed study of passenger traffic into New York City on the various routes from New Jersey points. The accompanying table summarizes the information which was secured from an elaborate traffic count.

Basic Plan of 1926

1. Construction of a new North Jersey rapid transit system.

2. Hudson & Manhattan Railroad extensions in New Jersey.

3. Interborough extensions of its Manhattan lines to New Jersey.

4. Brooklyn-Manhattan Transit system extensions from Manhattan to New Jersey.

5. Extension of North Jersey rapid transit system, listed as part one of this program, to serve a larger area.

6. Electrification of existing steam railroads.

The North Jersey rapid transit system, part one of the program, would consist of the following five lines:

1. Interstate loop line, running north and south between the Hackensack River and Bergen Hill in New Jersey, passing under the Hudson River via a tunnel at the Battery, up through Manhattan to 57th Street and back through another tunnel to New Durham. Its length would be 17.3 miles. A so-called Meadows Transfer station would be located near the intersection of the Erie and Delaware, Lackawanna & Western Railroads.

2. A line from Paterson through Montclair and Newark, following the Interstate loop route through Manhattan to New Durham and thence to Rutherford and Hackensack. The length of this route would be 41.9 miles.

3. A line from Ridgewood via Paterson, Passaic, Rutherford, New Durham, the Interstate loop route in New York City, to Newark and Elizabeth. Route mileage would be 39.8.

4. An intrastate route from Elizabeth through Newark and Rutherford to Hackensack, 18.8 miles in length.

5. Another intrastate line from New Durham to Newark, 13 miles in length.

Of the nine steam railroads involved, four, the Central Railroad of New Jersey; the Delaware, Lackawanna & Western; the Erie, and the West Shore, now handling 83 per cent of the commuting population, will need to make a complete reorganization of their terminal operations, and three will have to move from their waterfront terminals to the other side of Palisades Hill.

The commission has laid the situation before the managements of the roads affected and has obtained the co-operation of practically all of them. The West Shore is recommending a rearrangement of its terminal facilities in accordance with the commission's plans; the Erie, whose traffic load is 33 per cent of the total and exceeds by 46.8 per cent that of any other system, has made helpful suggestions and still has the plan under advisement. In this stand the Erie has been joined by the Lackawanna and the Central Railroad of New Jersey, whose traffic loads are 23 and 19 per cent respectively. The Hudson & Manhattan (which receives 31 per cent of its total passengers from steam railroads) has agreed to the extension of its lines to the proposed Meadows Transfer Station. The Pennsylvania Railroad, which enters New York directly and hence is not particularly concerned in the steam commuter problem, has raised no particular objection to the plan. The Lehigh Valley is noncommittal.

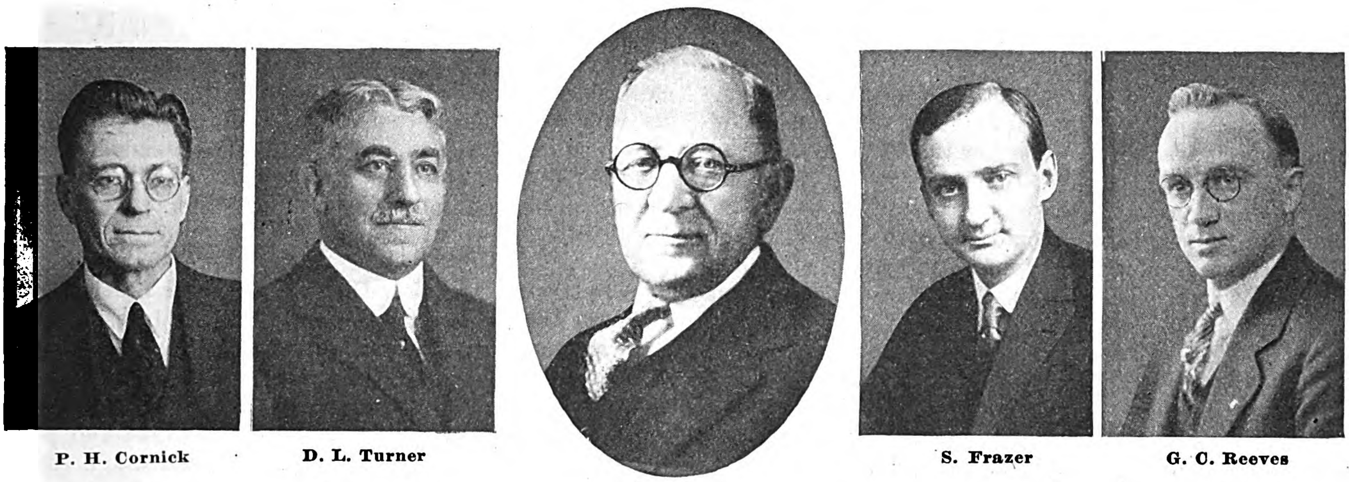
On the basis of a request from the engineering staff of the Port of New York Authority, the advisability was considered of revising plans for the proposed 178th Street and Fort Lee Bridge so as to permit of at least four rapid transit lines passing over this structure.

Journal Square Station

Returning to the outstanding modifications of and additions to the 1926 plan, the Journal Square Station, Jersey City, has been given considerable study because it is the locus of most of the bus and trolley passenger traffic on the west bank of the Hudson River. On a typical day the buses alone deliver 52,000 one-way passengers, most of whom use the Hudson & Manhattan tubes to New York City, so that any plan for traffic relief at this location affects both the Pennsylvania and H. & M. Railroads. "This plan," the report states, "proposes a rapid transit station to be located on the rock ledge which now forms the northeasterly side of the railroad cut in which the present H. & M. Journal Square Station is located. The station is to extend between the Hudson County Boulevard Bridge and a point some 250 ft. beyond the Summit Avenue Bridge. The rapid transit electric station platforms below are reached by ramps and stairs from a mezzanine over the electric tracks, which in turn is reached from the street level by additional ramps, one connecting with the Boulevard Bridge, another from Bascot and Magnolia Avenue, and another connection with the Public Service trolley plaza and the Hudson & Manhattan platforms. Entrances are also provided from Summit Avenue to this mezzanine. . . . Other studies for various routing through the Journal Square section which would not make use of the right-of-way of the Pennsylvania Railroad through the northern arch of the Boulevard Bridge also have been made."

Taking into account the colossal problem of financing the Interstate loop as a single unit and based upon suggestions of John H. Delaney, chairman of the Board of Transportation of New York City, the commission made nine different studies to determine the most advantageous routing for the North Jersey transit subway in order to make connections not only to the east side and west side Interborough lines but also to the independent system of the Board of Transportation. These plans include a Manhattan terminal building such as the present Hudson Terminal, utilization of the empty reverse movement capacity now existing on the local subway tracks during the morning and evening rush hours, and a general scheme that will not only collect the greatest number of commuters conveniently, but at the same time form a part of the final loop.

Of the nine studies, three of the most desirable are illustrated in this article. These are referred to as Schemes *F*, *G* and *I*. In all of these the North Jersey Transit Commission's subway line would enter Manhattan at the Battery. In Scheme *F* the line would bifurcate to make connections with local lines of the east side and west side Interborough subways, the former connection being south of Brooklyn Bridge with deep level stations under the east side line. This contemplates provisions for development of the Board of Transportation's subway plans.



P. H. Cornick **D. L. Turner** **D. A. Garber** **S. Frazer** **G. C. Reeves**

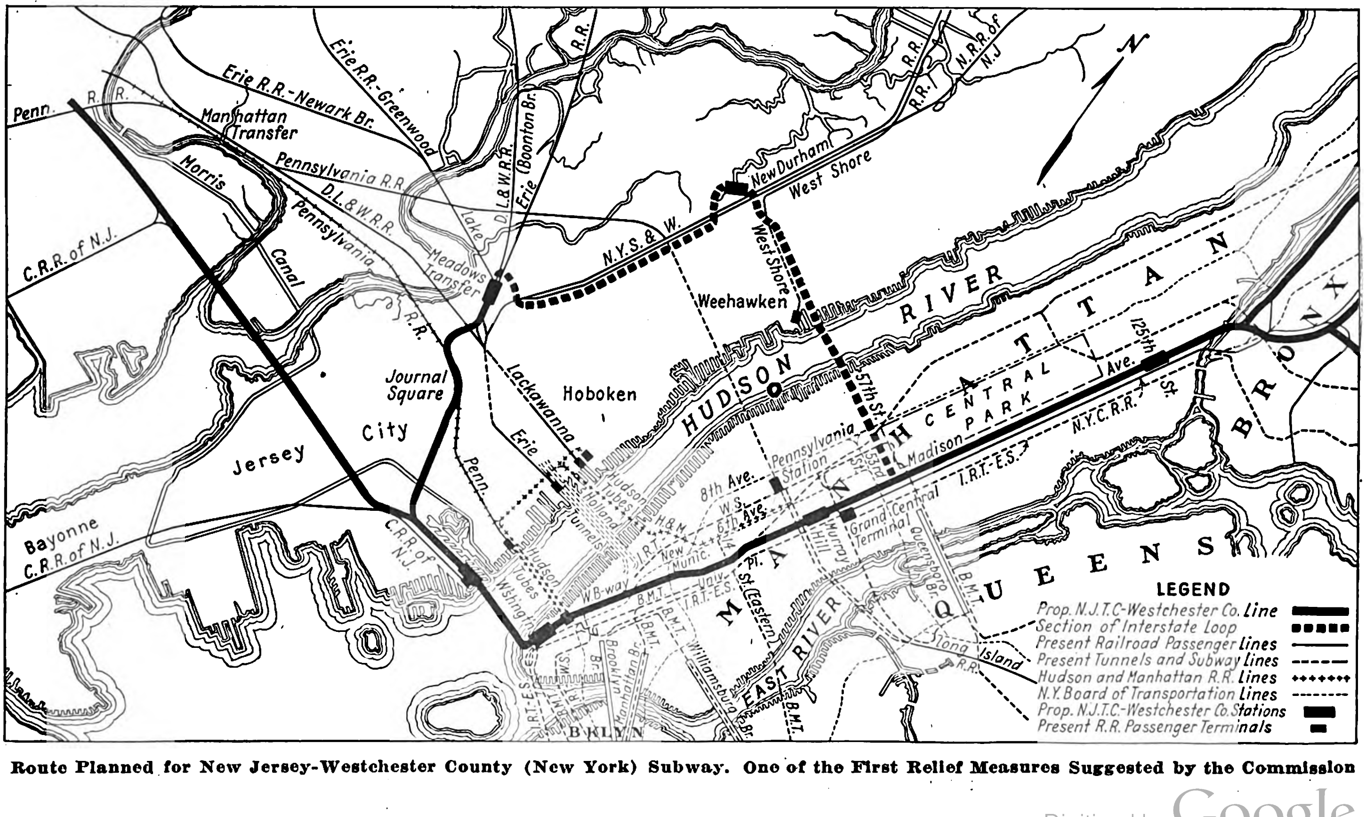
Men Responsible for 1927 North Jersey Transit Plans

Scheme *G*, on the other hand, proposes connections to both Interborough subways and also with the Board of Transportation's independent line in Church Street. The plan of the connection is shown in the map. Scheme *I* also proposes a connection to each of these three subways, but would include a cross-connecting track at Barclay Street. It also contemplates running the new line under Washington Street for the southern portion of the route, making connection with the east side subway at a point north of Worth Street.

According to the report, "all of the studies for one entrance into Manhattan have been made with the thought in mind that at some future time it would be necessary to have an independent commuter subway through Manhattan to connect with New Jersey. These schemes, *F, G* and *I*, are to be considered as a first step measure, and when the time does arrive for the independent commuter subway this first step construction would be used as a part of that independent line."

At New Durham, N. J., on the meadows opposite 57th Street, New York, the commission proposes a rapid transit station whereby the steam railroad passengers from the West Shore Railroad, the New York, Susquehanna & Western and the Northern Railroad of New Jersey will have opportunity to transfer to rapid transit electric trains for distribution in New York City or other parts of New Jersey when the comprehensive plan is accomplished. Four studies have been made for this station, any one of which would mean the removal of steam railroad passengers and local ferry passengers from the waterfront terminals. "This very important step," continues the report, "is one that should be made, and the West Shore Railroad is in sympathy with such a move."

Of the four plans presented, Scheme *D* provides for a complete separation of the Erie and West Shore Railroad tracks and platforms by a passageway or driveway leading to the ticket offices and other facilities. Directly over this passageway and parallel to the axis of the steam station platform are the electric tracks and platforms. To reach these platforms passenger bridges leading to a distributing concourse over the

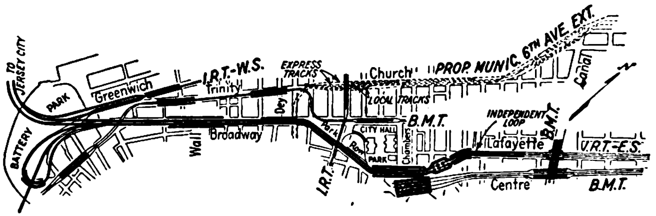

Penn. R.R.
Erie R.R.-Newark Br.
Erie R.R.-Greenwood
Manhattan Transfer
Morris Canal
Pennsylvania R.R.
D.L.&W.R.R.
Pennsylvania R.R.
C.R.R. of N.J.
Lake
D.L.&W.R.R.
Erie (Boonton Br.)
R.R.
R.R.
N.R.R. of N.J.
N
Meadows Transfer
N.Y.S.&W.
New Durham
West Shore
West Shore
Weehawken
Journal Square
Hoboken
Lackawanna
Erie
Penn.
Jersey City
Bayonne
C.R.R. of N.J.
C.R.R. of N.J.
Hudson Tubes
Holland Tunnels
Hudson Tubes
H.&M.
W'sh'ngt'n
W.B-way
I.R.T.
New Munic.
Univ. Pl.
I.R.T.-E.S.
B.M.T.
B.M.T.
B.M.T.
I.R.T.-E.S.
B.M.T.
W.S.
I.R.T.
Br.
Brooklyn
Manhattan Br.
Williamsburg Br.
B'KLYN
HUDSON RIVER
MANHATTAN
CENTRAL PARK
8th Ave.
W.S.
6th Ave.
14
Pennsylvania Station
57th St.
53rd St.
Madison Ave.
125th St.
N.Y.C.R.R.
I.R.T.-E.S.
Murray Hill
Grand Central Terminal
St. (Eastern)
EAST RIVER
Queensboro Br.
B.M.T.
B.M.T.
Long Island R.R.
QUEENS
BRONX
LEGEND
Prop. N.J.T.C-Westchester Co. Line
Section of Interstate Loop
Present Railroad Passenger Lines
Present Tunnels and Subway Lines
Hudson and Manhattan R.R. Lines
N.Y. Board of Transportation Lines
Prop. N.J.T.C-Westchester Co. Stations
Present R.R. Passenger Terminals

Route Planned for New Jersey-Westchester County (New York) Subway. One of the First Relief Measures Suggested by the Commission driveway and directly under the electric platforms are provided over the steam tracks.

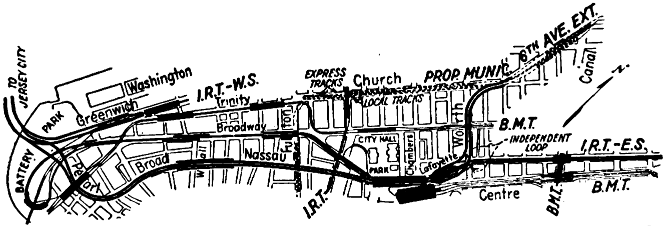
In order that this transfer station might be of service to the commuters, the minimum rapid transit construction required would be either the 57th Street trunk of the Interstate loop or the 41st Street extension of the Interborough subway. At this point recommendation is made that should the 57th Street tunnels be constructed before the Interstate loop, they should be made of sufficient size to accommodate standard railroad equipment.

B.-M.T. FOURTEENTH STREET EXTENSION

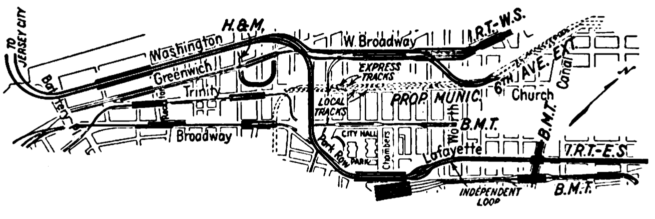
In regard to this extension the commission now makes these definite proposals as a means not only of effecting the most direct connection with the B.-M.T. subway for traffic of the Lackawanna and Erie, but of serving passengers from Hoboken and the heights section of Jersey City. The most advantageous route extends from Fourteenth Street and Sixth Avenue westward under the Hudson, emerging to the surface about Clinton Street, Hoboken, to pass into the side of Palisades Hill at Congress Street, where the route turns southward in subway into Palisade Avenue. Continuing under Palisade Avenue, the line turns into Franklin Street and thence into Manhattan Avenue, where, after the Hudson County Boulevard has been reached, it emerges in the western slope of the Palisades to continue on trestle to Meadows Transfer Station. This line will be stub-ended and the rapid transit electric trains will be returned over the same rails to New York City.


TO JERSEY CITY
BATTERY
PARK
Greenwich
Trinity
I.R.T.-W.S.
EXPRESS TRACKS
Church
PROP. MUNIC.
6TH AVE. EXT.
Canal
LOCAL TRACKS
Wall
Broadway
Dey
CITY HALL
PARK
B.M.T.
INDEPENDENT LOOP
Lafayette
B.M.T.
I.R.T.-E.S.
I.R.T.
Centre
B.M.T.

Scheme "F"—Proposed Physical Connection of the North Jersey Transit Line with the West Side Interborough Subway South of Rector Street and with the Local Tracks of the East Side Interborough Subway South of Brooklyn Bridge Station


TO JERSEY CITY
BATTERY
PARK
Washington
Greenwich
Trinity
I.R.T.-W.S.
Broadway
Broad
Pearl
Nassau
EXPRESS TRACKS
Church
LOCAL TRACKS
PROP. MUNIC.
6TH AVE. EXT.
Canal
CITY HALL
PARK
Chambers
Lafayette
Worth
B.M.T.
INDEPENDENT LOOP
I.R.T.-E.S.
I.R.T.
Centre
B.M.T.

Scheme "G"—Alternate Plan for Physical Connection of North Jersey Transit Line with East and West Side Interborough Subways and Subway of the Board of Transportation Now Being Built in Church Street


TO JERSEY CITY
H.&M.
Washington
Greenwich
Trinity
Battery
W. Broadway
I.R.T.-W.S.
EXPRESS TRACKS
LOCAL TRACKS
PROP. MUNIC.
6TH AVE. EXT.
Church
Canal
Broadway
CITY HALL
PARK
Chambers
Worth
B.M.T.
Lafayette
B.M.T.
I.R.T.-E.S.
INDEPENDENT LOOP
B.M.T.

Scheme "I"—Which Proposes Physical Connections with the West Side and East Side Interborough Subways and Also with the Independent Subway of the Board of Transportation

"This is a very logical extension," the report states, "and should be made at the earliest opportunity. Conference has revealed that such an extension would be acceptable to the New York Rapid Transit Corporation." In addition it is pointed out that it might prove desirable to extend this line to New Durham Transfer as well and then return to New York via the 57th Street tunnels to connect with the stub-ended tracks of the B.-M.T. at 59th Street and Seventh Avenue, thus forming the upper trunk of the Interstate loop.

INTERBOROUGH 41ST STREET EXTENSION

All plans for the New Durham Transfer Station provide for the extension of the 41st Street Interborough subway line as part of the rapid transit system almost in a direct line under the river through Palisades hill to the New Durham transfer station, with a subway station on Franklin Street between Boulevard and Bergenline Avenues, Union City, N. J., which would serve a large portion of those local ferry commuters now depending upon the Weehawken ferries for transportation to New York City.

WESTCHESTER-NEW JERSEY COMMUTER SUBWAY

On this project the commission makes some very definite observations based upon the uncertainty of the present subway policy of New York City, which it believes might prevent the construction of connections to the subways. In such an event the commission urges a co-ordination of effort with the authorities of Westchester County, New York, for the construction of an independent subway from some point in that county through the entire length of Mahattan, under the Hudson River to the Central Railroad of New Jersey terminal at Communipaw. Thence one section would continue along the Newark branch of that road to its present Broad Street station in Newark, while the other section would extend to Meadows Transfer through the Journal Square section of Jersey City. On this point the report continues:

> This would furnish Newark with a rapid transit service in addition to that rendered by the Pennsylvania Railroad (Hudson & Manhattan) and at the same time would afford the suburban passengers of the Erie and the Lackawanna Meadows Transfer access to a rapid transit line for distribution in New York City. Such a line would be economical of operation in that the loaded trains from Westchester County would distribute their passenger load through Manhattan; then these same trains would continue to Newark and Meadows Transfer and return with another load of Manhattan-bound passengers. This is a slight modification of a part of the comprehensive plan as presented in the 1926 report. The main points of difference, however, are only temporary in that the southern trunk of the proposed North Jersey Transit System would terminate at Newark until the comprehensive plan can be fully developed instead of continuing to Paterson or Elizabeth, and the Manhattan trunk would be continued to Westchester County until the 57th Street line or northern trunk of the Interstate loop could be constructed.
>
> In the event that the complete Interstate loop commuter subway cannot be developed and financed as a unit, then the first section of that loop constructed should be an express and local service line from and including Meadows Transfer station to a physical connection with the downtown Manhattan subways.
>
> Should the subway policy of New York prevent this physical connection to downtown Manhattan subways, then the first step of construction should be (in conjunction with the Westchester County of New York State) the Westchester-Meadows Transfer-Newark commuter subway.

PLAN OF FINANCE

The section of the report dealing with finance, comprising some eight chapters, is a powerful argument as to the fallacy of financing such a project by a private corporation. Admitting that there are probably one or two railroad companies in the North Jersey transit district which have reserves adequate for the establishment of their own commuter terminals in New York City, the report dismisses these as local and, continuing, comments:

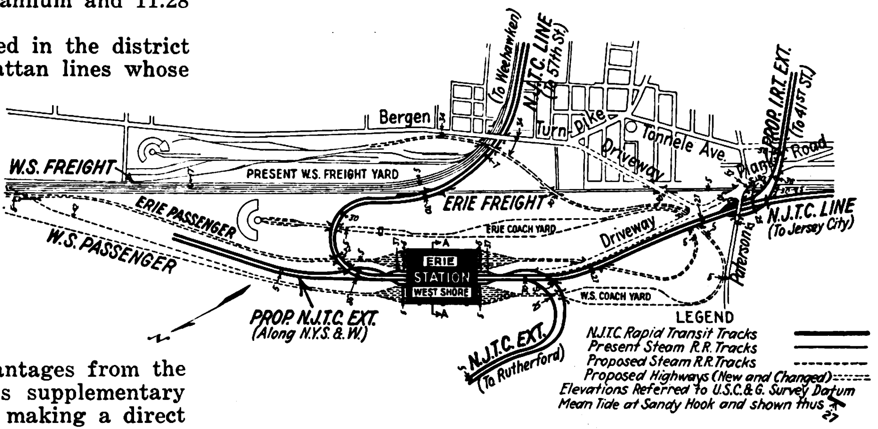
"So far as any comprehensive plan for rapid transit is concerned, however, no public body and no conceivable combination of private agencies is in position to provide accumulated capital sufficient for its consummation."

The commission also frowns on anticipated revenues as a means of financing the project and makes it clear that the only revenues that could be made available for construction costs would be those derived from taxes as special assessments. The report continues:

> The only remaining alternative is that of basing the financial plan, in part at least, in anticipating future revenues—in other words, the issuance of bonds to be supported out of operating revenues, taxes, special assessments, or a combination of all three. If the bonds are to be supported solely by fares and additional revenues from advertising, your engineers have estimated that the cost for total expenses would require a fare of 16.56 cents per passenger on a basis of 125,000,000 passengers per annum and 11.28 cents on a basis of 250,000,000.
>
> The nearest comparable service rendered in the district is that supplied by the Hudson & Manhattan lines whose fare is 5 cents for intrastate passengers and 6 or 10 cents for interstate passengers, depending on their destination in New York. It is open to question, therefore, whether it would be feasible, wise or desirable to rely solely on anticipated future operating revenues as a means of supporting construction costs. If that be granted, revenues derived through the taxing power would be needed at least to supplement operating revenues.
>
> A concrete example will serve to illustrate the relative advantages and disadvantages from the standpoint of the taxpayer of using this supplementary source as a basis for a bond issue, or of making a direct levy for construction funds as they are needed. The preliminary estimates made by the engineers of the cost of constructing the interstate loop (exclusive of land costs) totaled $154,000,000. Assuming a seven-year construction period and equal yearly expenditures throughout that term the annual requirements would amount to $22,000,000.
>
> In order to provide this from current tax revenues a levy amounting to $5.44 on every $1,000 in the net valuation taxable for 1926 in the North Jersey Transit district would be necessary. The weighted average tax rate imposed on the same base in 1926 for all purposes was $39.63 per $1,000. Assuming that all other governmental expenditures were to remain constant and that there were to be no change in assessed valuations, this additional burden would require an aggregate average tax rate of $45.07 per $1,000 for the seven-year period.
>
> If, on the other hand, seven successive bond issues for $22,000,000 each were to be made during the construction period, each issue running for 35 years and bearing interest at 4½ per cent per annum, and if sinking funds were assumed to earn at the rate of 3½ per cent yearly, then the increase in tax rate would amount to only 31 cents per $1,000 of assessed values of the first year. It would increase 31 cents per year during the remaining six years of the construction period and would then remain constant at $2.19 per year for 28 years.
>
> If current revenues from special assessments were to be relied on, the increased burden would, of course, remain the same, but the base against which it was levied would be considerably narrower. It is evident, therefore, that no plan for financing construction costs direct from current revenues, and without resort to bond issue, can be carried out for a work of the magnitude of the proposed Interstate loop without bringing about an unduly severe increase in the current burdens which already fall on taxable or assessable property.

Following the foregoing analysis, the commission makes the following conclusions relative to choice of means of financing that would seem to be warranted:

> 1. *That the proposed North Jersey Transit System be publicly financed and publicly owned.* It is true that the only rapid transit system now operating in the North Jersey transit district was provided by private capital. It is probable, furthermore, that certain of the railway companies which handle large numbers of commuters in this district have the capital and credit necessary to provide rapid transit connections with New York City for their passengers. Nevertheless, all such operations, desirable though they may be, can provide only local and temporary relief; and there is slight probability that any one company, or any group of companies, can provide the necessary capital for a transit system of the type which the North Jersey Transit Commission believes to be essential to the continued and symmetrical growth of the territory comprised within the district.
>
> 2. *That the bonds to be issued for construction costs be supported by supplementary pledges of full faith and credit based on the taxing power.* Regardless of the types of revenues which are to be pledged to the support and retirement of bonds, the supplementary pledge of full faith and credit is essential to obtaining the lowest interest rates.
>
> 3. *That the maximum term of all bonds issued for transit developments, regardless of the specific part of the work for which they are to be issued, be fixed at 35 years.* The completion of a rapid transit system in this region will inevitably bring new population, and an attendant increase in problems, for whose solution further bond issues will be needed. The imposition of long-deferred burdens which will fall on future generations, who will have abundant current burdens of their own, is therefore to be avoided.


(To Weehawken)
N.J.T.C. LINE (To 57th St.)
PROP. I.R.T. EXT. (To 41st St.)
Bergen
Turn Pike
Tonnele Ave.
Driveway
Plank Road
W.S. FREIGHT
PRESENT W.S. FREIGHT YARD
ERIE FREIGHT
ERIE PASSENGER
W.S. PASSENGER
ERIE COACH YARD
Driveway
N.J.T.C. LINE (To Jersey City)
ERIE
STATION
WEST SHORE
A
A
W.S. COACH YARD
Paterson
PROP. N.J.T.C. EXT. (Along N.Y.S. & W.)
N.J.T.C. EXT. (To Rutherford)
LEGEND
N.J.T.C. Rapid Transit Tracks
Present Steam R.R. Tracks
Proposed Steam R.R. Tracks
Proposed Highways (New and Changed)
Elevations Referred to U.S.C.& G. Survey Datum Mean Tide at Sandy Hook and shown thus
27

Scheme "D"—Proposed Transfer Station at New Durham, N. J., for Commuters on Several Branch Lines of the Erie Railroad and for the West Shore Railroad. This Plan Has Been Indorsed by the Latter Road

SPECIAL TAXING POWERS ASKED

In the main the legal section of the report is a plea that the commission be empowered with authority to levy taxes within the territory affected:

> A study of the portion of this report dealing with the physical and financial aspects of the transit situation shows that no type of agency now in existence, except that of state authority financed by general state tax or by state bond issue, similar to the existing Highway Commission, can bring to the problem powers adequate for its solution.
>
> And yet the problem, despite its magnitude and the large territory involved, is essentially a district problem, in which other portions of the state have naturally either no interest at all, or, if we bear in mind the rapidly growing Camden metropolitan section at best so slight an interest as to make the proposal of state-wide authority supported by the contribution of the whole state, whether in the form of direct tax or of bonds, one which must seem obnoxious to the voters of those parts and therefore, quite naturally and properly, one which, except under unusual conditions, would scarcely receive the support of the senators and assemblymen from those counties. . . . Many commissions have been granted assessing powers, and this has been upheld not only in state courts but in the broadcast terms by the federal Supreme Court as in no way violating the due process and equal protection clauses of the federal Constitution.

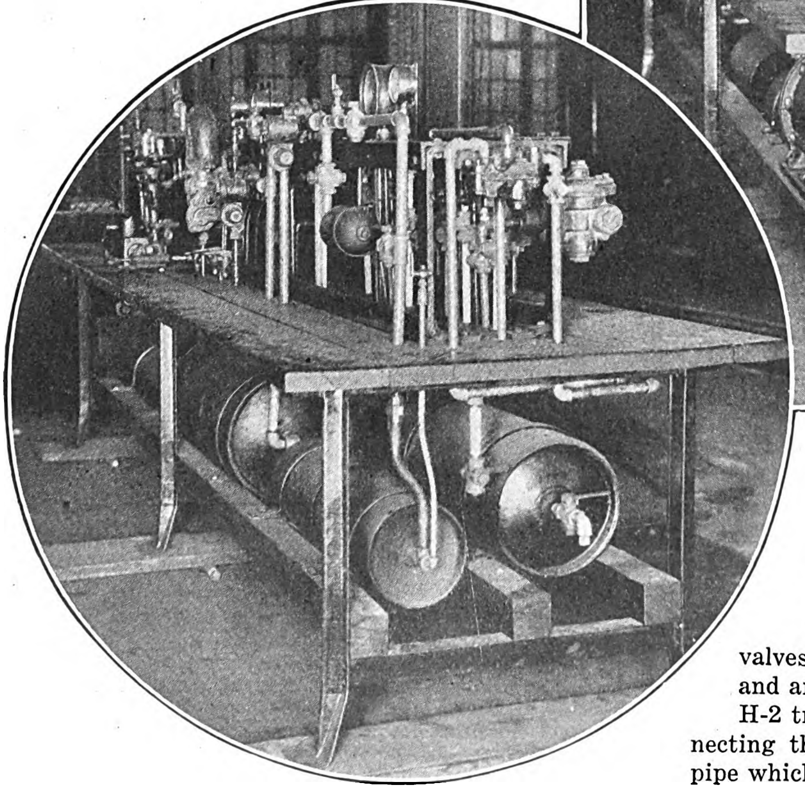
Air Equipment Tested in Place on Cars

Thorough Testing of Triple Valves, Motorman's Valves, Brake Cylinders, Feed Valves and Other Parts by Means of a New Test Rack Has Eliminated Many Troubles on the Cars of the Indiana Service Corporation

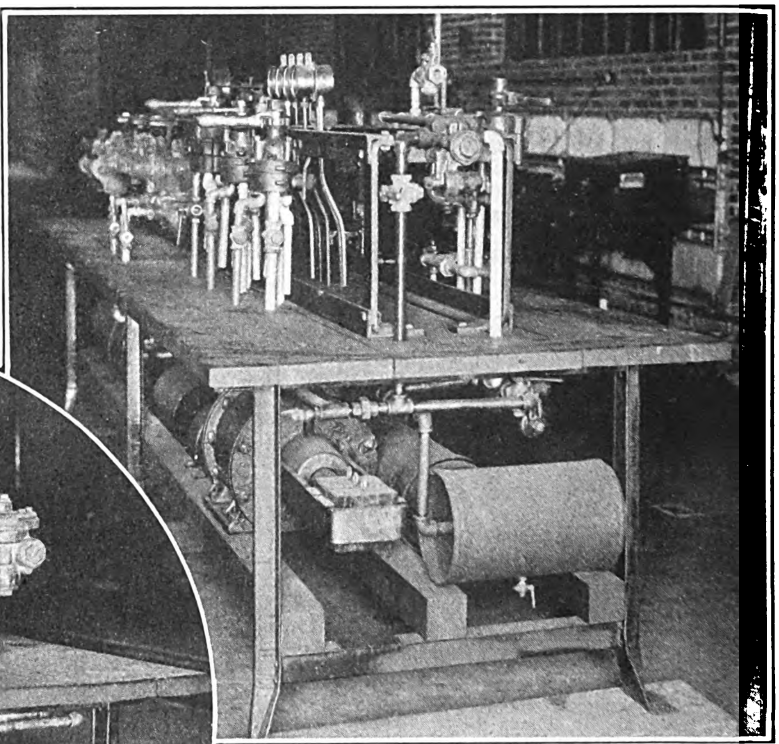
By Arthur W. Reddersen
Superintendent of Motive Power Indiana Service Corporation, Fort Wayne, Ind.

Each piece of air apparatus used on either city or interurban cars of the Indiana Service Corporation is given a thorough test by means of an air brake test rack, recently completed and installed as a part of the equipment of the Spy Run shops at Fort Wayne. The air supply for operating the rack is furnished by a 225-ft. shop compressor, located in the basement. Air lines from this run to the rack and also to the various shop pits for careful testing of the equipment in place on the cars. Where desirable, equipment may also be removed and taken to the rack for testing.

The top of the bench on which the various pieces of air brake test equipment is installed is 14 ft. long, 46 in. wide and 36 in. above the floor. In the center is a framework built up of 2¼-in. x ⅜-in. angles. It is 11 ft. 4 in. long, 18 in. high and 14 in. wide. This is bolted to the top of the bench and braced at each end so as to leave 16 in. of bench space all the way around, providing a convenient place for tools when testing and making adjustments. All pipe brackets are mounted on the framework, with the necessary cut-out cocks located in the pipe lines between the brackets and top of the bench.



Space on Top of the Bench Around the Test Rack Provides a Convenient Place for Tools When Making Adjustments



The Brake Cylinder Installed Underneath the Bench Is Provided with Blocks so that Different Length Piston Travel Can Be Obtained.

A brake-pipe line is run in the basement of the shop to the tracks where box cars and all non-compressor car repair work is done, so that after the brake rigging has been overhauled and the triple valves and brake cylinders cleaned and lubricated a test is given for piston travel before the car is again returned to service.

A brake cylinder located under the bench is operated when any triple or brake valve is being tested, unless this cylinder is cut out by closing the double cut-out cock above the bench. A yoke is attached to the non-pressure head of the brake cylinder so that by dropping in blocks of various thicknesses any given piston travel may be obtained and the result indicated on the brake cylinder gage.

Automatic engineer valves and triple valves are tested on one side of the rack. Feed valves, governors, safety valves, gong ringers, door engines, low-pressure city brake valves and emergency valves are connected in with the straight air brakes and are tested on the opposite side of the rack. An H-2 triple valve application test is provided by connecting the brake pipe to atmosphere through a ⅜-in. pipe which runs above the bench with a cut-out cock on the end. The cut-out cock is plugged at one opening. The plug is drilled with a hole of the proper size so that the brake pipe pressure is reduced from 70 lb. to 50 lb. in ten seconds when the cut-out cock is open. Two duplex and six single-pointer test gages are used on the rack, each mounted so as to be in the operator's direct range of vision while tests are made.

Following are some of the troubles that have been overcome through the building of the rack:

Previous to the installation and use of the present careful testing methods frequently a triple valve would be removed from a car on account of a defective slide valve. Either the inspector would fail to mark the cause of removal or the tag would become destroyed before the triple valve arrived at the repairman's bench. The repairman, not being able to detect the defective slide valve, would clean the valve and mark it O.K. An inspector would again put the triple valve on a car, only to find that the slide valve was defective. This often necessitated going to the shop for another triple valve and caused delay to the train as well as unnecessary expense in getting proper equipment to make the car pass the test.

Since the installation of the test rack, triple valves are given a test after cleaning. Those found to have defective slide valves are sent to the factory for a general overhauling. After being cleaned all feed valves are given a rack test and a code test, as recommended by the Westinghouse Air Brake Company. If they do not pass this test, they are also sent to the factory for general overhauling.

The rack has been arranged so that it can be used for instruction, as well as for testing purposes. Motormen being instructed on car equipment can thus be shown what actually happens in addition to obtaining explanations of the various operations. These include particularly the time required to charge the auxiliary reservoirs after a train has been made up and the importance of waiting until all auxiliary reservoirs are charged before attempting to make a terminal brake test. Motormen are also shown that when making a brake application it is useless to reduce the brake pipe pressure below the point of equalization. The importance of stopping the brake pipe reduction when the point of equalization has been reached is explained. This instruction has proved very beneficial.

The Readers' Forum

Extensive Rehabilitation Programme Planned by South Carolina Power Company

CHARLESTON, S. C., Jan. 22, 1927.

To the Editor:

An extensive program of improvement and modernization has been mapped out for the railway department of the South Carolina Power Company. This includes track renewals, the substitution of improved rolling stock for worn-out or obsolete equipment, and an advertising campaign to "sell rides" in connection with the improvements.

It has been recommended that all cars in regular service be equipped with comfortable, upholstered seats, and with floor covering. All cars will be painted in our new standard color, a bright orange, and instead of being lettered will carry a distinctive insignia emblematic of the company.

It is our opinion that by furnishing the public economical, safe and dependable service, and keeping that picture prominently before their eyes, we can increase our gross revenue to such an extent that with the attendant economies in operation, we can finally pull a mighty sick patient out of the hospital.

H. BIGELOW,
Superintendent of Railway.

Careful Inspection Program Gives Good Results

PHILADELPHIA RAPID TRANSIT COMPANY
PHILADELPHIA, PA., Jan. 20, 1927.

To the Editor:

Before the present one-man, two-man, front-entrance, center-exit cars were adopted as standard on the Philadelphia Rapid Transit Company lines a very thorough study was made of the operating requirements in this city. The variety of transportation requirements led us to believe that a car of the maximum flexibility was necessary for our purpose, and we feel that our present type is the best which has yet been developed to fulfill our needs. Our fare collection system was also developed from a standpoint of giving the maximum of adaptability to all our service requirements. It is possible to operate one of our standard cars over any of our surface lines and in the surface car subway on Market Street. We will probably continue to standardize on this car design until some later development appears which will prove even more desirable for use in our co-ordinated transportation system.

It is true that we have not placed a great deal of emphasis upon interior fittings which approximate the luxurious. Deep spring seats with leather upholstery have doubtless proved very satisfactory in many applications, but we have thus far found it expedient to retain the wooden seats, both lengthwise and crosswise. Great care is manifested at all times, however, to keep the cars thoroughly clean and attractive, both inside and out. We have adopted a very positive schedule for car cleaning and inspection, and as a result we have succeeded in reducing our electrical and mechanical failures from a total of 15,035 in 1921 to 2,102 in 1926.

To obtain this gratifying result the following schedule for car cleaning and inspection has been adopted:

Daily—The interiors of the cars are washed thoroughly with a solution consisting of one part disinfectant to fifteen parts of water.

Weekly—The interiors of the cars are cleaned thoroughly and the exteriors are given a complete washing.

500 Car-Miles—At the end of this period, the so-called "A" inspection is given to the cars. This consists of a careful mechanical inspection of fundamental brake equipment, control equipment and current collection equipment.

2,500 Car-Miles—After this interval the car is given both an "A" and "B" inspection. The "A" inspection was described above. The "B" inspection consists in giving the cars a thorough lubrication of the controls, motors, compressors, etc.

7,500 Car-Miles—At this time the cars receive a complete electrical and mechanical inspection which covers all operating parts of the cars.

60,000 Car-Miles—When this limit is reached every car is completely overhauled and sent through the paint shop.

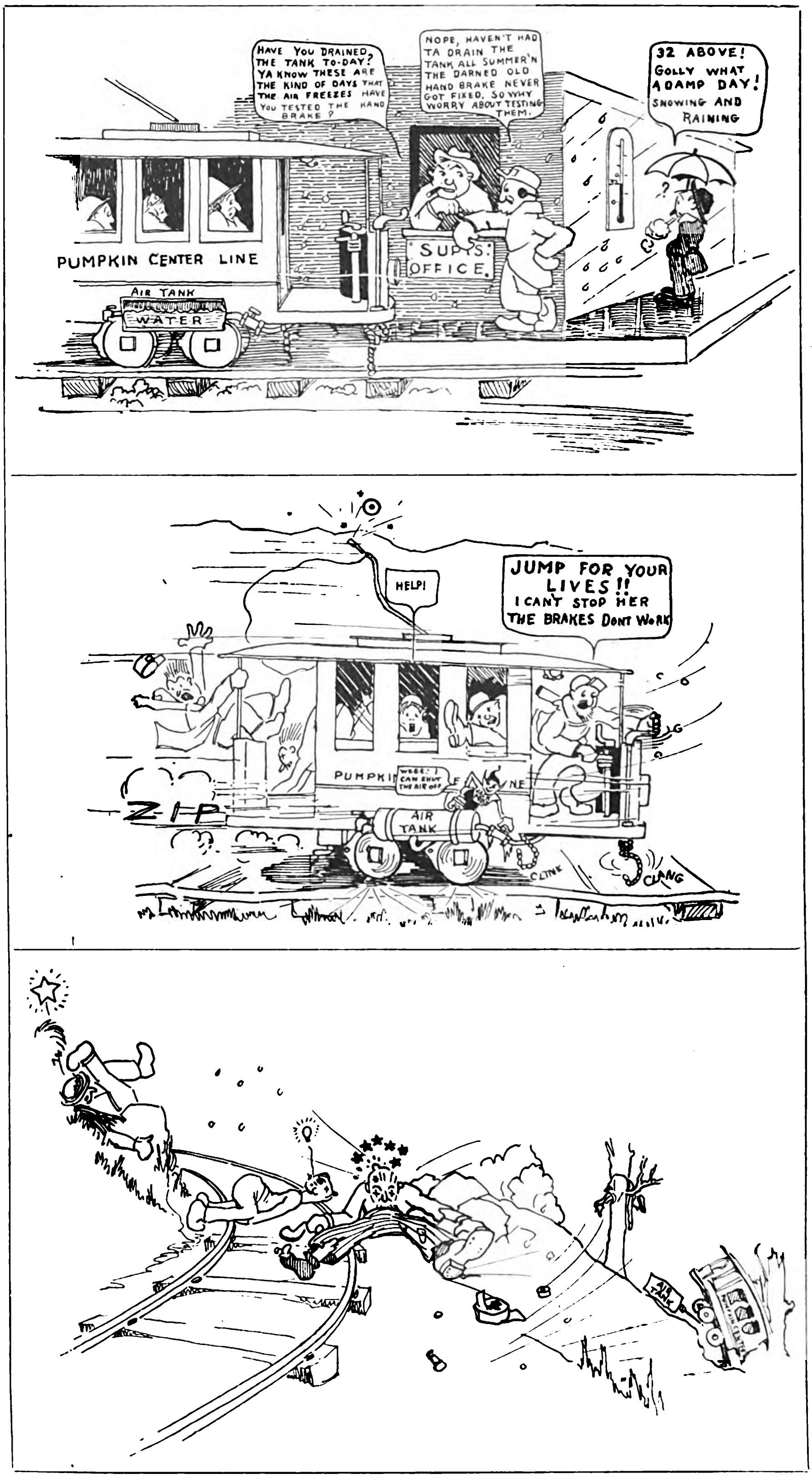
Not only has this system succeeded in reducing the street failures to a remarkable extent but it has also had a very favorable reaction from the public. Frequent comments are heard on the cleanliness and well-painted appearance of the surface cars, and we find that our conductors and motormen react very favorably to public appreciation shown for presentable rolling stock. The cost of cleaning and painting cars is after all but a small price to pay for the gratifying returns in public good will and in improved morale which is bound to follow, and this does not take account of the material savings in maintenance expenditures which result from reduced street failures.

G. H. STIER,
Superintendent Rolling Stock and Buildings.

Adventures of

Old Man Trouble on the Hicksville Railway

The Electric Car Is Not an Aquatic Animal


HAVE YOU DRAINED, THE TANK TO-DAY? YA KNOW THESE ARE THE KIND OF DAYS THAT THE AIR FREEZES HAVE YOU TESTED THE HAND BRAKE ?
NOPE, HAVEN'T HAD TA DRAIN THE TANK ALL SUMMER'N THE DARNED OLD HAND BRAKE NEVER GOT FIXED. SO WHY WORRY ABOUT TESTING THEM.
32 ABOVE! GOLLY WHAT A DAMP DAY! SNOWING AND RAINING
PUMPKIN CENTER LINE
SUP'T'S OFFICE.
AIR TANK
WATER
HELP!
JUMP FOR YOUR LIVES!! I CAN'T STOP HER THE BRAKES DONT WORK
WEEE! I CAN SHUT THE AIR OFF
AIR TANK
ZIP
CLINK
CLANG
AIR TANK

Air reservoirs should be drained often in cold weather and hand brakes should be tested on every trip. Dry reservoirs and piping constitute the surest way of avoiding freeze-ups.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page free of charge for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

M. ZIMMERMAN and E. L. PROCTOR

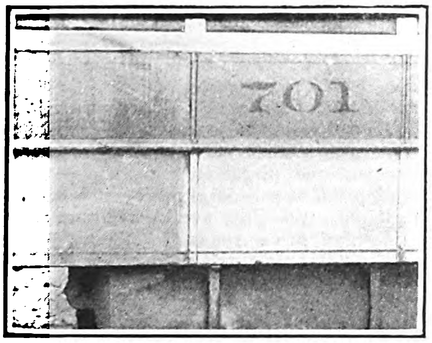
Maintenance Notes

Weekly Washing Keeps Cars Attractive

By A. F. Rexroth
Master Mechanic Harrisburg Railways, Harrisburg, Pa.

Believing that clean cars are one of the greatest inducements to ride, the Harrisburg Railways, Harrisburg, Pa., devotes particular attention to car washing. Cars are scrubbed and washed with soap every seven to ten days and a more general and thorough scouring and cleaning are given once a year. In the general cleaning Wyandotte detergent is used.

This is a scouring preparation somewhat like pumice. From 8 lb. to 10 lb. of this preparation is used to about 8 gal. of hot water. This quantity will clean and scour a 48-ft. car inside and out. An accompanying illustration shows a car as it is being scoured by this process. A marked contrast is shown in the car portion which has been washed and that which has not as yet received the treatment.



The Light Part of the Panel has Just Been Cleaned. The Remaining Part of the Car Is in Its Original Condition

The keeping of cars clean and attractive has been facilitated somewhat by the use of the enamel system of car painting that was adopted some time ago to replace the paint and varnish system. Cars now receive two coats of enamel, which is the equivalent of a three-color paint job.

Be Wise, Systematize,
Open your eyes, Modernize
And thus Economize.

"Join the K.K.K.'s"
"Keep Kars Klean"

This enamel is placed over the old paint and a good job is obtained. After a car has been newly enameled a record is placed immediately under the water table showing the date and kind of job done. Thus the designation "E-1-15-27" would show that an enamel job was done on the car on Jan. 15, 1927.

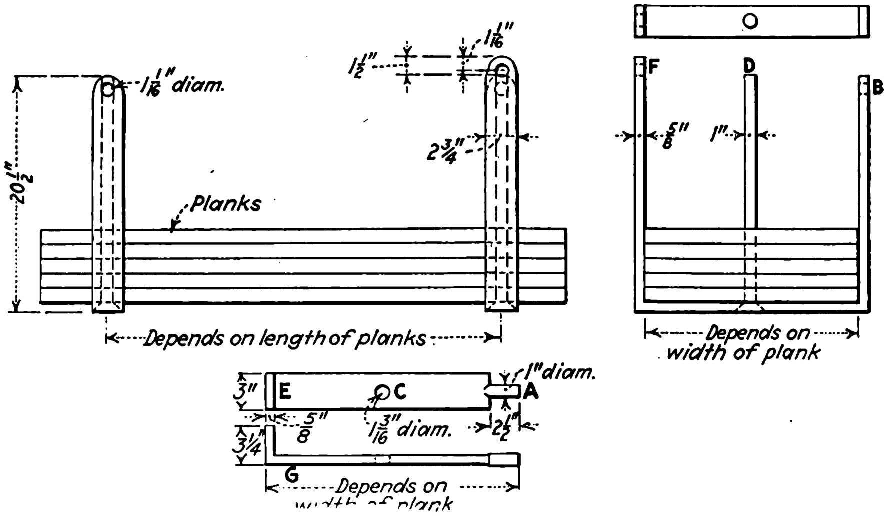
The second time that a car is brought in for refinishing by the enamel system it is given but one coat of enamel and is then restriped and relettered. By this method cars are kept in attractive condition without great expense.

Receptacle for Scaffold Plank Storage

It is a common occurrence for the paint shop organizations to be annoyed and their work retarded when men of other departments remove scaffolding planks from the paint shop and utilize them for other purposes. This was particularly true in the shop of the Washington, Baltimore & Annapolis Electric Railroad, Academy Junction, Md. To overcome this objectionable condition and assure the painters that the planks would always be at hand when required, George Watts, foreman painter, designed and built a receptacle for the storage of the scaffolding planks which has not only permitted uniform and neat storage but provided a means for locking them securely to prevent removal.

There are two ⅝-in. x 2¾-in. bar-steel U-shaped frames, each with a piece of 1-in. round bar riveted at the center of the bottom. A ⅝-in. x 3-in. flat steel strap slips in suitable holes in the uprights and provides a means of padlocking. Each plank has a 1⅛-in. hole bored in the center about 12 in. from either end. The planks are impaled in the upright posts. After the clamp is placed in position and locked it is impossible to remove any of these planks unless the padlock or other parts are destroyed. Planks not in use during the day are kept locked and the key is retained by the foreman of the paint shop. At the close of the day all planks are returned to their receptacles and locked.

This method has resulted in eliminating paint shop delays. The planks are always at hand when required. Accidents caused by breakage have been reduced since the planks are not being used for purposes for which they were not designed.

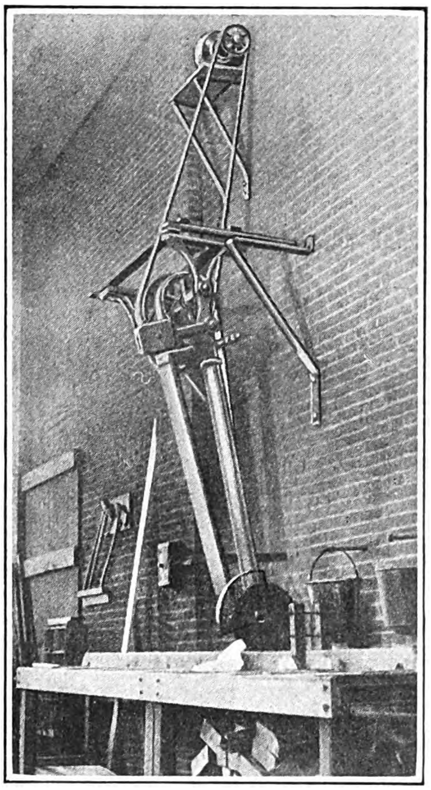


Appearance of Scaffold Storage Used in the W., B. & A. Shop

Rod *A* slips into hole *B*, rod *D* passes through hole *C*. Surface *G* rests on top plank. Holes *E* and *F* are in line and are fastened with a padlock.

Saw Belt Driven by Air Compressor Motor

INDIVIDUAL electric drive for a circular swing saw has been provided in the shop of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., through the utilization of an air compressor motor. This motor is suspended from the side wall directly above the saw by means of strong, rigid brackets and is belted through a countershaft. All of the shop requirements for this class of work are easily handled by this unit.



Circular Swing Saw Belt Driven by an Air Compressor

Utilize the PEP in the uPkEeP of your equipment.

Pull-in Classifications Corrected

IN THE table published on page 250 of the issue of Feb. 5 giving a comparative statement of car pull-ins for the year 1926 as reported by the Electric Railway Association of Equipment Men, Southern Properties, the headings "Not chargeable to carhouse" and "Chargeable to carhouse" were reversed. The lower table should have carried the first heading and the upper table the second heading.

Dick Prescott Considers Shop Policy

And Reaches a Conclusion

DICK PRESCOTT, assistant shop superintendent of the Consolidated Railway & Light Company, spent considerable time studying the design of the springs used by the company for replacements on various types of trucks. Following his investigation of the use of wood blocks to compensate for sagged springs he found that the practice of ordering replacement springs by sample had led to considerable variation in the materials obtained, with consequent unsatisfactory performance in service.

Study of the subject led him to a careful check of the operating loads on various types of equipment in service, and finally to the preparation of a series of drawings and specifications covering the types of springs needed for replacement purposes on each series of equipment.

"Here," concluded Dick, "is the kind of work that should be done by the engineering forces in a maintenance organization."

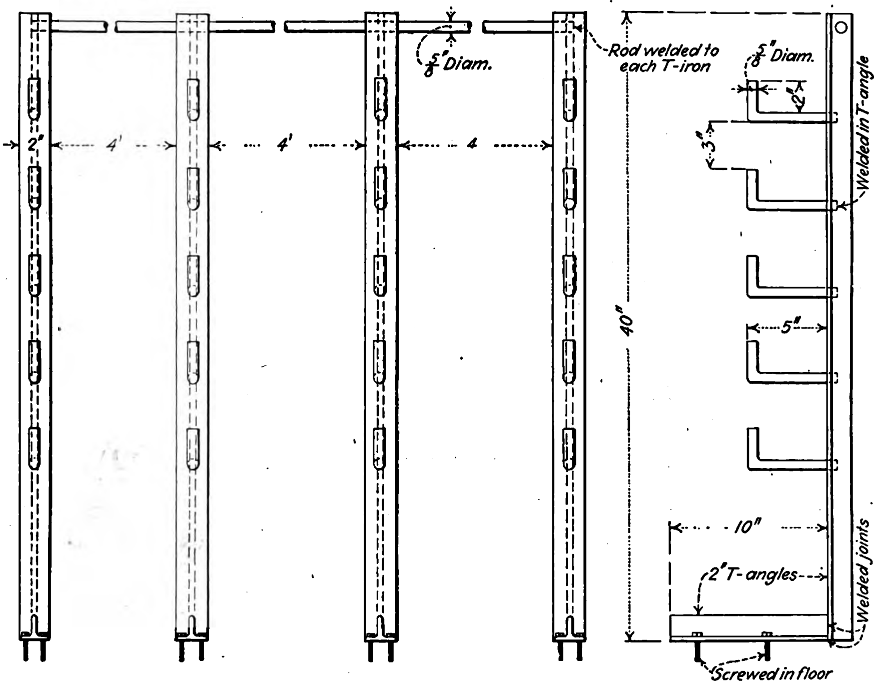
This particular subject was one to which Dick Prescott had devoted considerable thought. He had found in the Consolidated shop a general tendency to manufacture many parts, which he believed could better be obtained from regular manufacturers. True, there were machines and men available, and the manufacture of parts tended to give the shop a better load factor. So there had always existed a question as to just what constituted a sound shop policy in regard to the manufacture of parts. With the development of an engineering offce in the shop there was an even greater tendency than formerly toward manufacturing activity.

Dick had established a clearly defined policy in his own mind. "The question of delivery is one of the important factors in drawing the line between manufacture and purchase," he concluded. "Here again the stores and purchasing departments are important elements. We have a tendency to order replacements in ridiculously small quantities, and unquestionably this habit affects both the matter of delivery and cost. Careful checking of inventories and renewal parts consumption per year; closer co-operation between the shop, storeroom and purchasing department, and adoption of a general policy of buying all parts possible, even when there is a slight price shade in favor of home manufacture, would improve our situation."

His study also led to the conviction that it was hard to obtain the actual cost of manufactured parts and that the factors of quality and uniformity were sometimes stretched in favor of the shop's own output. But despite all this, he felt that there was an even more important reason for avoiding home-made manufacture as much as possible. "A railway shop," he concluded, "is primarily a maintenance organization. Its resources should be devoted to the improvement of maintenance practices and not to the manufacture of items that can be purchased from reliable manufacturers. An organization which devotes itself to the manufacture of a wide variety of parts does not give the attention which is needed to improving maintenance procedure and methods. This affects particularly the men in supervisory or technical positions. When the shop becomes a manufacturing organization, it attracts the major attention of the men in key positions, from the head of the department down. For that reason, attention which should be devoted to the primary problems of maintenance is diverted elsewhere, and the principal function of the mechanical department is left very much to drift, while the problems of manufacture absorb attention."

Dick was so impressed with the soundness of these views that he undertook the preparation of a report on this subject to the company's operating staff for Tom Mullaney's signature.

Rack for Storage of Light Bar Steel



Rack Installed in Norfolk Machine Shop of the Virginia Electric & Power Company for Storage of Light Bar Steel

BELIEVING that the appearance of a machine shop floor reflected the character of the work being performed, Master Mechanic T. W. Madison of the Virginia Electric & Power Company, Norfolk, Va., designed and erected a compact rack in the machine shop for the storage of assorted light bar steel. Prior to the erection of this rack, this material was scattered around the floor of the machine shop, creating a very untidy appearance.

This rack is constructed of four L-shaped T sections spaced 4 ft. 2 in. centers and bolted to the floor. These T's are reinforced at the top by a ⅝-in. round steel bar 12 ft. 9 in. long passing through and welded to the web, about 1½ in. from the top. A piece of T-bar 10 in. long welded to the end of another 40 in. long forms the L-shaped support. Five L-shaped ⅝-in. diameter rods, 5¾ in. long, spaced 5⅝ in. centers, form the members for the support of the stored material. These supports are inserted in holes drilled in the web of the T's and welded.

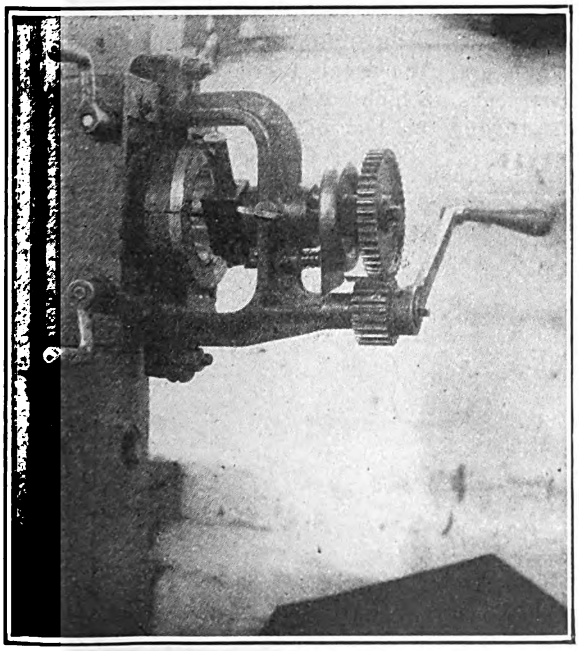
This rack occupies very little floor space. It has been found very effective for the storage of this material and has assisted in maintaining a better shop floor appearance.

Axle-Bearing Flange Fitted to Truck

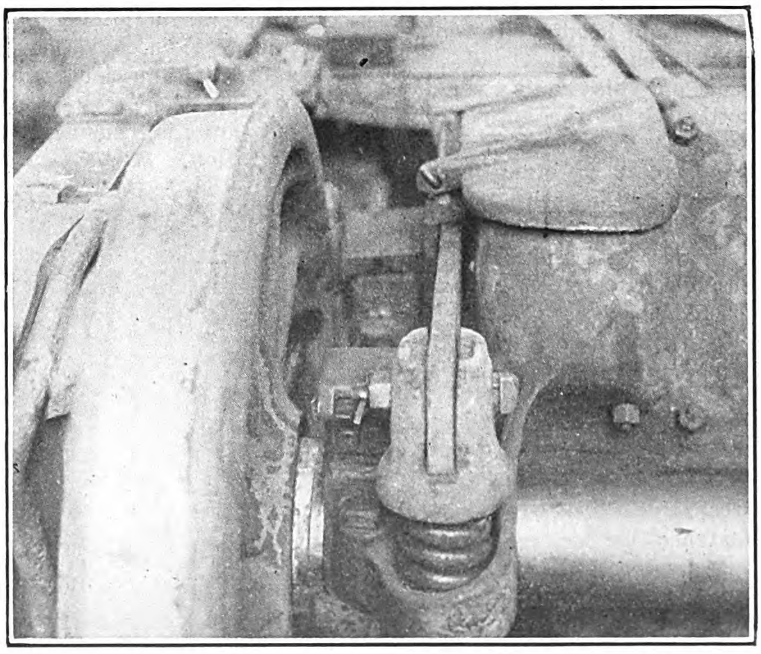
BECAUSE narrow-gage trucks are used on the Los Angeles Railway cars, there is no axle collar against which the axle bearing can be fitted. As a result it is necessary to fit the axle bearing flange to the gear on one side and wheel on the other, allowing the proper clearance.

In the truck shop, the motor is swung into its place, the pinion aligned with the gear, and then the gear end axle-bearing flange is trimmed to allow approximately $\frac{1}{32}$-in. clearance between it and the gear. The other axle-bearing flange is trimmed to allow $\frac{1}{32}$-in. clearance between it and the wheel at the commutator end of the motor. The size of each bearing flange is determined by calipering the space between the motor shell and the wheel or gear, as the case may be.

A machine to cut the flange of the bearing has been constructed and



A Machine Mounted on a Post in Los Angeles Railway Truck Shop Trims Off the Flange Face of Axle Bearing to Give It the Proper Clearance in the Narrow-Gage Truck



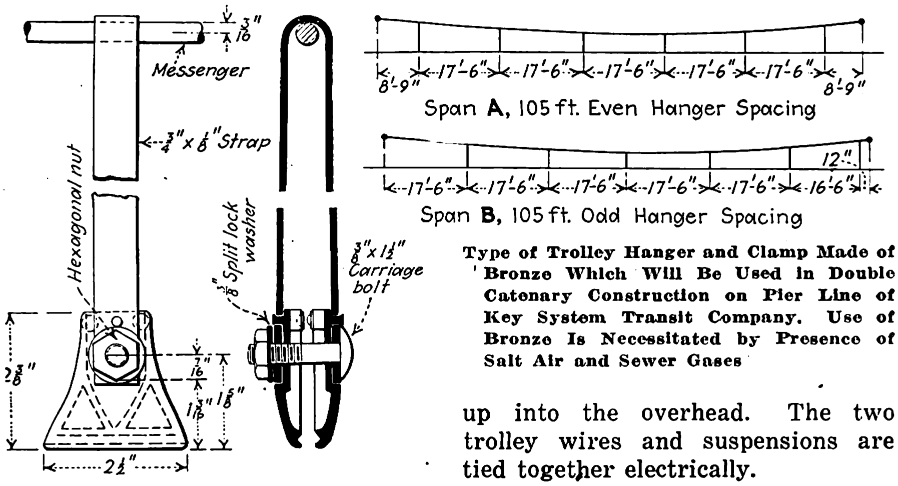
Close Quarters in Narrow-Gage Trucks Eliminates the Possibility of an Axle Collar. The Axle-Bearing Flange Fits Against the Gear at the Gear End of the Motor and Against the Wheel at the Commutator End. A Clearance of Approximately $\frac{1}{32}$ In. Is Allowed is mounted on a workbench in the truck shop. It consists of a clamping device for holding the two halves of the bearing and a U-shaped frame which has a spindle carrying the cutting tool at the end of an arm. The spindle is turned by hand through a single reduction spur gearing. One of the illustrations shows the construction of this machine. The cross feed is automatic, the tool arm being moved out of the spindle head by a feed screw, actuated by a five-pointed star pick-up, which on each revolution of the spindle strikes a lug, advancing it one point. A bin below the machine catches the waste metal, which is later reclaimed and put back into the babbitt pouring pot.

Double Catenary Insures Service

DOUBLE catenary suspension with a double trolley arranged as independent supply for pantograph operation is being installed by the Key System Transit Company, Oakland, Cal., on the 3½-mile double-track pier route between the mole, where the ferryboats connect with the cars, and the mainland at Oakland. This installation is entirely of copper and bronze. It replaces several types of overhead suspension used on this route, which is the bottleneck of the entire Key Route System. Failure of the overhead on this section of right-of-way means paralyzing the entire system. Therefore, it was decided to make the overhead construction of the best possible type and in duplicate so that mechanical failure of one line would not interfere with service.

The new trolley suspension is of the catenary type with a ⅜-in. composition bronze messenger supporting by bronze straps a No. 0000 Phono-electric trolley wire. The straps are of ¾ x ⅛-in. special bronze, fastened by bronze carriage bolts, lock washer and hexagonal nut to a trolley clamp which is designed for either wheel or pantograph operation. The two trolley wires of this construction are spaced approximately 6 in. apart, with the hanger spacing staggered to give odd and even spacing in the same span. The roller of the pantograph makes contact with both trolley wires, and as a result the mechanical failure of one does not permit the roller to fly up into the overhead. The two trolley wires and suspensions are tied together electrically.

This type of construction, using bronze, is made necessary by the climatic conditions. Salt air and the sewer gas encountered, particularly on the flats, cause excessive corrosion of any metal other than bronze or copper. The old overhead line, with galvanized messenger and hangers, has only seen service for a few years, but now is considered unsafe for operation.



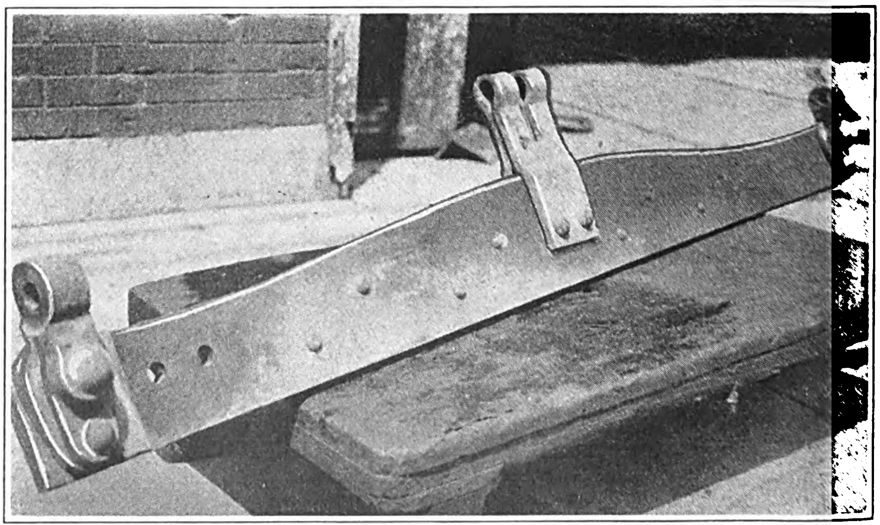
Type of Trolley Hanger and Clamp Made of Bronze Which Will Be Used in Double Catenary Construction on Pier Line of Key System Transit Company. Use of Bronze Is Necessitated by Presence of Salt Air and Sewer Gases

Brake Beams that Are Worn Where the Pull Rods Are Attached Are Built Up by Oxyacetylene Gas Welding

Welding Brake Beams to Make Good as New

BRAKE beams on all types of cars become worn at points where the pull rods are attached. The practice of the Grand Rapids Railway, Grand Rapids, Mich., is to build up the worn surfaces, fill in the holes and when redrilled the beams are as good as new.

Some of these are found to be worn to a depth of ⅜ in. The welding work is done with an oxyacetylene outfit and a welder can build up and fill in the holes of a brake beam in half an hour. Accompanying illustrations show where the wear takes place and a beam which has been repaired. This method of repair has proved effective in reducing noise.



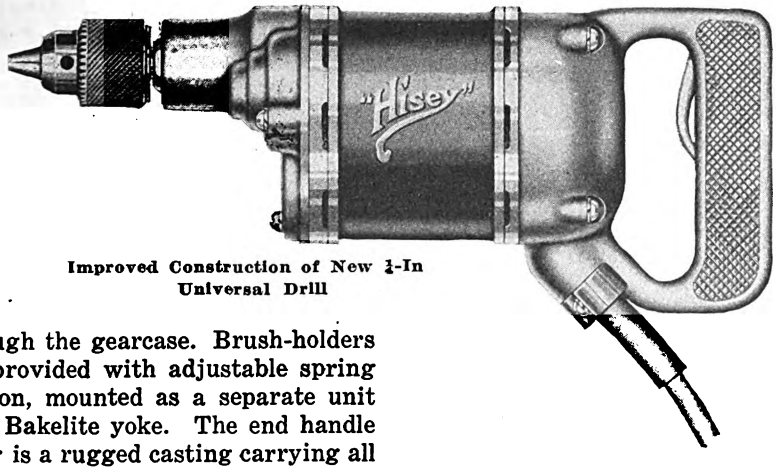
Brake Beam Repaired by Welding Ready for Installation on Car

New Equipment Available

Small Size Electric Drill

BALL bearings and a removable gear on the armature shaft are features of an electric drill of ¼-in. capacity placed on the market by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The gearing is made of high grade steel, electrically heat treated. The compound gear shaft is supported with bearings at each end.

The chuck spindle is hardened and ground and automatically lubricated through the gearcase. Brush-holders are provided with adjustable spring tension, mounted as a separate unit on a Bakelite yoke. The end handle cover is a rugged casting carrying all pressure applied and is independent of the motor and its bearings. This arrangement relieves them of all strain and also affords convenient access to the carbon brushes for adjustment or renewal.



Improved Construction of New ¼-In Universal Drill

Repairs made in time save pull-ins from the line.

Improved Unit Switch Construction

BY THE application of the type 480 mechanism to the 272 switch unit, which was made possible by the development of new arc chutes, operators are given the advantages of more modern construction in unit switches manufactured by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

The design of the type 480 mechanism is such that the contacts close with a rolling motion which eliminates wiping action. This mechanism uses a contact spring worked at a low fiber stress. The switch arm gives the mechanism better protection from arc gases and cast copper arc horns with a large cross-section of metal provide better dissipation of the heat of the arc. The use of the type 480 mechanism results in less frictional wear on the contacts, less burning of the contacts, arc horns and arc chutes and the practical elimination of finger spring breakage.

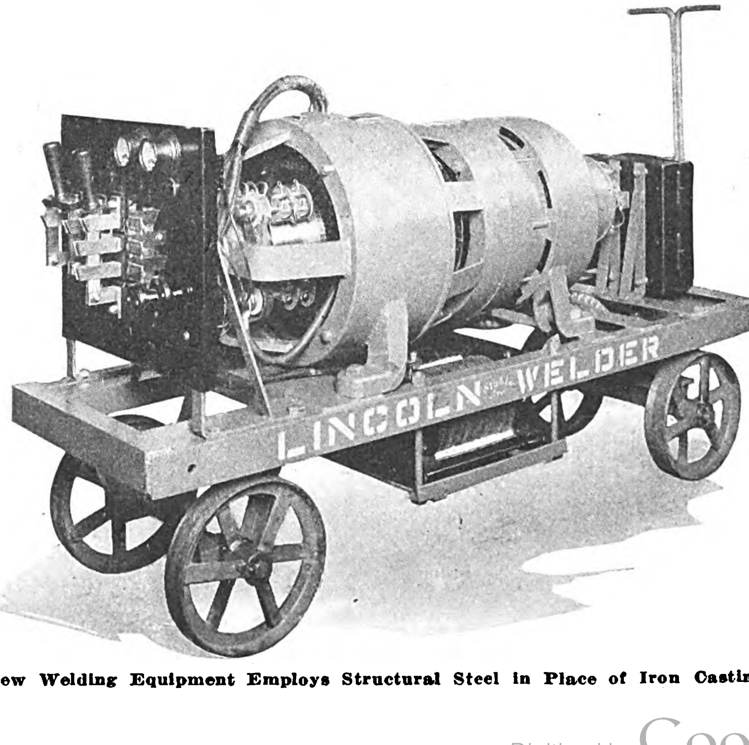
The new arc chutes are built up of asbestos lumber with sides and blocks made from a special arc-resisting molded material. The arc blocks are shaped so that they reduce the possibility of arc gases entering the switch mechanism. The complete arc chute is fastened in the switch box by one wing bolt, which permits removal with minimum effort.

In replacing old switch units, it is recommended that those in an entire group be replaced at the same time, preferably when the equipment is overhauled. Old switch units should be dismantled and serviceable parts placed in stock to be used to maintain the type 272 switch units which have not been modernized. As the stock of the old parts becomes low, additional equipment should be changed over. This permits modernization with the least confusion and lowest cost to the operator.

Welded Steel Shapes Used in Welding Framework

SUBSTITUTION of welded structural steel to replace gray iron castings for the 300-amp. "Stable-Arc" welder has just been announced by the Lincoln Electric Company, Cleveland, Ohio. The motor and generator end rings, brackets and connecting rings are all made of structural angles rolled up into the proper shapes and welded together. The feet of the motor-generator set are made of drop forgings. The truck wheels are of T-sections rolled on a special machine. The hub of the wheel is made of steel tubing. Control panels are usually made of slate or special non-metallic compounds, but the panel of the new machine is made of sheet steel welded together and welded to the supports.

The underlying idea in the adoption of this construction for the new welder is to meet the severe conditions which portable welding equipment must withstand. It is claimed that use of the steel construction, which will bend rather than break, reduces the liability of failure.



New Welding Equipment Employs Structural Steel in Place of Iron Castings

Association News & Discussions

Central Master Mechanics Meet in Toledo

Busy One-Day Session Devoted to Discussion of Brakes, Perfection of Standard Freight Car Specifications and Other Matters Which Would Facilitate Interchange of Equipment

PROGRESS in the work of bringing about greater uniformity of practice among interurban roads in the C.E.R.A. territory was made at a meeting of the Central Electric Railway Master Mechanics' Association held in Toledo, Ohio, on Feb. 2, immediately preceding the meeting of the parent association. Various phases of the work being done by this body to facilitate the interchange of freight equipment among the interurban lines in the central association territory were taken up for progress reports, discussion and further development. Car builders' representatives were present to discuss with the entire group questions in connection with the design and construction of the standard interurban box car, which was one of the early important accomplishments resulting from the work carried on since the organization of this association.

Crowded into the short space of a single day's session was a combination program consisting of papers by manufacturers' experts on subjects of direct interest to the equipment men, a conference and discussion on the work of standing committees and the customary inspection trip through the shops of the home company, in this case the Community Traction Company of Toledo. Air brake design and maintenance practices were covered in a paper on this subject by W. C. Horner of the Westinghouse Air Brake Company. This formed the basis for considerable discussion of brake inspection and maintenance methods. At the request of the association, this paper will be printed in complete form in an early issue of ELECTRIC RAILWAY JOURNAL so that it may be made available to all mechanical men interested in the subject.

AIR-MAGNETIC BRAKES DISCUSSED

Another subject which aroused a great deal of interest and discussion was that of air-magnetic brakes, which was presented by C. V. Ives of the General Electric Company. He covered particularly the form of brake developed co-operatively by the Buffalo & Erie Railway, the General Electric Company and the Cincinnati Car Company. In this design the magnetic brake is energized directly from the trolley instead of by regeneration of the motors. Magnetic brake equipments heretofore used, he explained, fall into three classes: (1) The solenoid brake, in which the armature of a solenoid transmits pressure to brake shoes on the wheels; (2) the disk brake, in which a disk keyed to the axle is retarded by a stationary disk, magnetically attracted to it; (3) the track brake, in which an electro-magnetically actuated shoe acts on the rail and is at the same time mechanically connected to wheel shoes through a system of levers.

In practically all former installations, both in this country and abroad, current for energizing the magnets has been taken from the car motors acting as generators. This method of deriving the power, according to Mr. Ives, afforded the outstanding advantage of the magnetic brake; i.e., the retarding force is automatically decreased as the speed of the car is reduced, thereby compensating for the increase in the coefficient of friction as the car speed declines. This characteristic tends toward uniform retardation without requiring any special skill on the part of the operator. On the other hand, the speaker held that the additional apparatus required and the additional size of motor needed represented inherent disadvantages of most former designs. Resistance banks were needed to limit the current to the brakes during the braking controller operations. Furthermore, when the car reached a stop and the motor armatures stopped rotating it was necessary to utilize the hand brakes to keep the car from moving.

COMING MEETINGS
OF
Electric Railway and Allied Associations

March 4—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

March 8-10—Oklahoma Utilities Association, ninth annual convention, Huckins Hotel, Oklahoma City, Okla.

March 17-18—Illinois Electric Railways Association, seventh annual joint convention, Hotel Abraham Lincoln, Springfield, Ill.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

With any form of wheel brakes, the rate of retardation is limited by the adhesion between the wheels and the rail. For that reason, Mr. Ives explained, the combination air-magnetic design is a development of value in making possible much quicker and shorter stops in emergency than are possible with air brakes alone. He cited the results of tests made on the Buffalo & Erie property and published in ELECTRIC RAILWAY JOURNAL for July 17, 1926, page 96, and Aug. 21, 1926, page 290.

USES TROLLEY CURRENT

Due to the use of direct trolley current instead of regeneration from the motors, the control of the air-magnetic design has been worked out in a very simple manner. The design is such that the magnetic track brake is automatically brought into play whenever an emergency application of the air brake is made. It may also be used for service stops (at the will of the operator) in case of a slippery rail, provided he has first made either a partial or full application of the air brake. The automatic feature is obtained by connecting a relay valve to the automatic sanding line of the standard safety car devices. This is used as a means of actuating the relay valve, which in turn admits air from the main reservoir to small vertical cylinders that push the magnet shoes down on the rail. At the same time reservoir air is admitted to a pneumatic contactor which connects the coils of the magnet shoes, through a fixed resistance, to the line. The service application feature is obtained by connecting the manual sanding pipe from the M-28 brake valve to the relay valve through a cut-off valve, the latter being open only when the straight air application pipe is under pressure. In the pipe between the brake valve and the cut-off valve a timing element, consisting of a small reservoir and vent plug, is installed so that the magnetic brake is held on for a predetermined time and is then released independently of the air brake. In any condition of operation, the magnetic brake is released with the release of the air brake.

Mr. Ives also spoke of the continued satisfactory performance of the brakes of this type which have been installed on the Buffalo & Erie property and also on the cars of the Kentucky Traction & Terminal Company. Reports on these properties indicate that maintenance costs up to date have been quite low. He said also that operators of cars equipped with the new brakes are given a sense of security in knowing that a quick stop can be made in an emergency, and that they can accurately judge service stops even under bad rail conditions.

Most of the proceedings during the business session consisted of reports of standing committees and discussions regarding their recommendations. Questions raised by car builders in connection with the specifications for the C.E.R.A. standard box cars were the subject of careful analysis. Other recommendations of the standards committee, of which T. H. Nicholl is chairman, occupied a considerable period of consideration and discussion. Recommendations were made by this committee regarding standards which it felt should become American Electric Railway Association Standards to be included in the Engineering Manual of that association. The committee also presented for discussion the design of a master inspector's gage and recommended that arrangements be made so that a number sufficient to provide at least one gage for each member property could be ordered from a reputable tool manufacturer in order that all rejections of cars passing over foreign lines would be in accordance with a standard gage. This was felt to be more than worth while as a means of avoiding controversy because of differences in the gages made up individually by the various properties.

New officers elected for the ensuing year were as follows: President, G. R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway; vice-president, F. J. Foote, superintendent of motive power and equipment Indiana, Columbus & Eastern Traction Company. Charles Sigler, master mechanic Winona Service Company, was elected a new member of the executive committee. An invitation of the Westinghouse Air Brake Company to hold the next meeting of the association in Pittsburgh, so as to permit an inspection of the air brake plant at Wilmerding to be made, was accepted, and it was decided to make this a two-day meeting, the exact date to be set later.

The business session adjourned in the afternoon for an inspection of the shops of the Community Traction Company. During the noon-day recess all of the visiting master mechanics were entertained at luncheon by the local company. General Manager J. F. Johnson, Commercial Manager J. A. Greig and Master Mechanic W. A. Smith acted as hosts.

Higher Standards of Maintenance Will Improve Performance and Reduce Costs*

Modern Shop Machinery, Higher Grade Workmanship and Closer Tolerances Are Needed—Better and More Reliable Performance and Lower Ultimate Costs Will Result

By H. S. Williams
Assistant Superintendent of Equipment
Department of Street Railways, Detroit

Electric railway operations at present show the most alert and progressive spirit that has been manifest in a decade. The mechanical departments are feeling this and are devoting renewed study to maintenance problems. But actual improvement takes more than a decision by the equipment department to adopt higher standards; it requires that the idea be sold to the management and it is the underlying thought in the preparation of this paper to assist in this latter very necessary detail. The question that first arises before the manager is cost, and following that is its corollary—will the results justify the cost. If these two questions can be answered properly the result will or should be the acceptance of the plan. Higher maintenance standards mean slightly higher initial cost, but if intelligently applied will result in ultimate economies that will wipe out the first cost, produce continued savings and help give a more salable service to the public.

Let us examine for a moment the functions of maintenance. The first requirement is to provide for cleaning and sanitation, lubrication and adjustment of wearing parts. The second function is concerned with the detection of defective parts and their renewal before they cause difficulty, which aims at keeping the equipment in as nearly 100 per cent physical condition as is feasible. This requires foresight and regular inspection designed to anticipate possible trouble. In other words, let us call this preventive maintenance. Third, and of almost equal importance, is the study of the equipment and methods with a view to making improvements that will be economically beneficial and that will also increase the sales value of the ride.

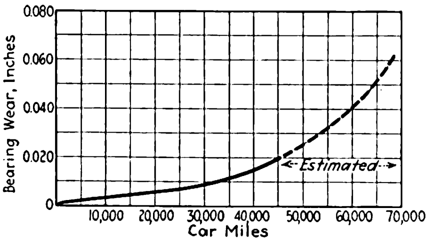


Fig. 1—Progressive Bearing Wear. Average of Tests of Sixteen Railway Motor Axle Bearings

It is not my purpose to dwell long upon the first element, though it may not be amiss to call attention to the unquestioned sales value of clean cars. People will not ride in dirty cars if there is any other means of transportation available. It is regrettable that it cannot be shown how many riders will be attracted to a car on account of its cleanliness or how many will be driven away because of its untidy condition. In a time like the present not only our own interest but the good of the communities which we serve demands that we win over the private automobile driver. But how is that possible if the seat, say of rattan, is bordered with a brownish discoloration and is only presentable where the passengers' clothing has cleaned off a part of the car seat; if the floor is littered with papers, transfer stubs, coin wrappers and dust drifts in every corner and out-of-the-way place; if the windows are streaked and dirty? It just cannot be done and the sooner we stop trying to cut the expense of car cleaning to the bone, the sooner we will help overcome the falling riding habit.

Preventive Maintenance Reduces Pull-Ins

As to preventive maintenance, we must lay especial stress on this item. Probably no one questions the economy of the principle. What is needed is more extensive use of means now within reach. A systematic, thorough, periodic overhaul program is or should be the goal of every equipment man. Failing in this, the next alternative seems to be the application of a periodic testing of car wiring, motors and all electrical equipment with high voltage in order that weak spots may be broken down at a chosen and opportune time. This results in lowered maintenance cost and improved service through reduced pull-ins. As a specific example of the effect of this practice upon pull-ins is cited the case of a road which adopted this practice in 1924 after an intensive campaign to reduce pull-ins. In this case the reductions are almost entirely attributable to the detection and repair of potential electrical failures before they caused road failures. The results are shown in the following tabulation:

COMPARISON OF PULL-INS FROM POWER CIRCUIT FAILURES AND BREAKDOWNS ON HIGH-TENSION TEST

Year	Pull-Ins per Thousand Car-Miles Due to Power Circuit Failures	Cost of Account 33 per Car-Mile	Cars Broken Down by High-Tension Test
1923	0.0647	0.0059	....
1924	0.0478	0.0044	216
1925	0.0257	0.0043	514
1926	0.0312	0.0042	1,101

It is to be noted in this tabulation that there is a slight increase in pull-ins in 1926, which is explained by an abnormal storm and flood. The increasing number of cars broken down by the high-tension test is explained by added facilities for making these tests and a more strict following out of the procedure. It will be seen, however, that the added breakdowns shown in the last column did not produce a corresponding increase in the cost of maintenance of electrical equipment.

Bearing Abuse Increases Cost

Perhaps one of the most abused elements of a street car is the motor axle bearing and there is no one item to which higher maintenance standards can be applied to better advantage. This is true because the condition of this bearing controls not only its own life but that of the motor gears. This being a sleeve type bearing, it is apparent that if it be maintained at a close fit, the only wear to which it will be subjected is frictional. So if the housing is properly designed to exclude dirt and if sufficient lubrication is provided, maximum life of the bearing will be obtained. However, if the original fit be loose enough to allow radial movement, if ever so slight, the bearing is then subjected to impact blows which are far more destructive than the frictional wear and consequently the rate of wear instead of progressing in even stages will increase at an accelerated rate. To illustrate, it is only necessary to compare this hammering action to the main or connecting rod bearings of the automobile engine. Every one is familiar with the action of these bearings and the fact that when well-fitted their life is relatively long. But let them become worn to the stage where hammer is apparent and you know how rapidly the wear accelerates to the destruction point. In order to make a definite application of this principle to the axle bearing and show exactly what happens in actual service on electric cars a series of tests has been run and accurate measurements have been made showing progressive bearing wear.

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*Abstract of paper presented before Central Electric Railway Association at Toledo, Ohio, Feb. 4, 1927.

Sixteen bearings of the solid bronze type were used in the test. The analysis of this bearing metal is: Copper, 79; tin, 8; lead, 8; zinc, 5. The bearings were new and were carefully fitted in their housings. All of them were tightly clamped in position and three sets of measurements of inside diameters were taken by inside micrometers. These measurements were made at either end and the center, so that liability to error was reduced as far as possible. To secure a range of motor sizes, the bearings were divided among 35, 50, and 70-hp. motors. At intervals, the motors were removed from the cars, the bearings clamped back in position and the inside diameters measured. This test has been under way for fifteen months, and while it has not been finished, sufficient data are available to show the tendency of wear and to predict its future trend with reasonable assurance. So far as could be determined, this is the first study that has been made of progressive bearing wear of motor bearings. A detailed record of all the data obtained to date would needlessly confuse this discussion, so the averages have been computed and are shown graphically in an accompanying illustration. Attention is called to the fact that the results from the various test bearings are remarkably consistent. This gives confidence that the results shown in the graph reproduced on the preceding page can be depended on.

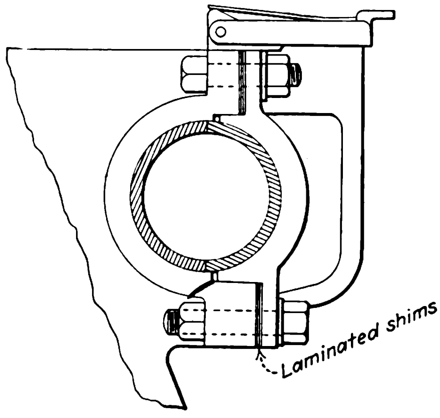

Fig. 2—Type of Railway Motor Bearing Tested

The important deduction from this test is the value of bearing mileage during the time that the bearing clearances are small, or, stated in another and more specific way, a bearing wear of 0.001 in. in the early stages of bearing life will give approximately ten times as much mileage as 0.001 in. of wear near the end of its life. This furnishes proof that loose bearings are not economical and that to secure maximum life the original bearing fit must be as tight as practicable.

Assuming agreement with the principle that loose bearings are not economical, what shall be done to maintenance standards to bring about greater life and economy? First, the outside surface of the bearing should be given more attention. The bearing should receive careful machining, to the end that when clamped in position the strains of the axle cap shall be uniformly distributed and that there shall be no distortion. Also the clamping should produce the strong vise-like action that will hold the bearing tightly in the shell and will eliminate dependence upon keys or dowels to keep the bearing from turning. Dowels were originally designed as locating means only, although the practice has gradually grown into existence of expecting them to hold the bearing from turning. In fitting of axle bearings the practice should closely approximate the fitting of connecting rod bearings of an automobile engine. The cap should have a clearance at its bolting lugs and this space should be filled with laminated shims. The intent of this may be understood better by reference to the accompanying illustration which shows the recommended method of fitting.

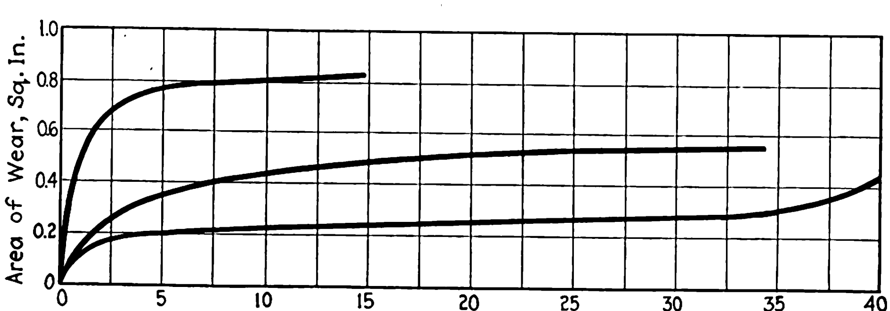

Fig. 3—Characteristic Gear Tooth Wear

SMALLER CLEARANCES DESIRABLE

As to the wearing surface of the bearing, it is believed that clearances may be made smaller with profit. To do this the bearings must not only be individually fitted to the axles, but it is contended that the finish fit must be a line-reaming operation. If you will check the alignment of surfaces of newly prepared bearings when clamped in position but without the axle in place the necessity of this will be readily apparent in most cases. A line-reaming operation is not necessarily a difficult nor complicated thing if properly approached. It is estimated that it will add not more than $1.75 to the cost of one motor overhaul while the value of added life should run to many times this cost.

Present standards call for an axle-bearing clearance of 0.015 in. to 0.017 in. Every thousandth that can be saved in original fitting means approximately 5,000 miles added to its life. With careful machining the clearances may be reduced to 0.010, or 0.007 in. less than present practice. This, it is predicted, will add 35,000 miles to the bearing life, which will certainly justify the added cost of higher standards of machining previously mentioned. The next step that logically follows is to apply the line-reaming operation to armature bearings, though the results from this will not show results proportionate to those obtained from axle bearings.

BEARING WEAR AFFECTS GEAR LIFE

As stated previously, bearing wear has an important effect upon the life of gearing. Loose bearings will superimpose the element of hammer blow upon the normal frictional wear in exactly the same manner as pointed out in the case of axle bearings. A third element of wear is injected into the case when bearing wear is such as to permit a spreading of gear centers, although this is the least important factor. This is contrary to the commonly accepted view, but it is a fact that if the tooth form is correct and the mounting of the gearing is solid, that is, that the bearings are not worn, the effect of spread centers has little effect on the efficiency of the involute gear. Of course if the teeth are badly worn, another set of conditions is introduced and the normal wear will be excessive.

Spreading centers of correct gears changes the pressure angle. This results in increased tooth and bearing pressures and concentration of wear over a smaller area of the tooth. To show the exact effect of this, the change of pressure has been calculated for the spur gearing of a modern 35-hp. motor with a 20-deg. pressure angle. If the bearings on this motor allow the gear centers to spread ⅛ in. this changes the pressure angle but 2.2 per cent. This means that tooth pressure and bearing pressure due to gears is increased only 2.2 per cent. This naturally results in increased wear, but the increase is not sufficient to cause alarm if bearings are tight. Such, however, is not the case in practice because the thing that causes spread centers is worn bearings. As in the case of the bearings themselves, this looseness allows vibration and consequent hammer blow on the gear teeth with a resultant wear far in excess of normal frictional wear. The exact loss of life due to the hammer blow is difficult of determination. It could be evaluated only after a long series of practical tests. However, it is predicted that the probable wear characteristic will resemble the form of curve shown in Fig. 1.

Now let us examine the other side of the picture and see what would happen to the gear life if the bearings are kept tight. Recently an exhaustive investigation of gear life was made by the University of Illinois. This included careful records of progressive wear. From the data secured in these tests computations have been made to show the characteristic wear of gears. Of course the tests referred to were not made upon railway gears, but the tooth form was the same and pressure angles used were 14½ deg. and 20 deg. Fig. 3 shows the results for several combinations. From this it will be seen that wear occurs rapidly at first but slowly toward the end of its life. Just previous to the finish of the test, the wear curve shows an abrupt rise. The value of these data is to show the tendency of gear tooth wear under good conditions or what the characteristic wear will be if bearings are kept tight. If bearings are loose then the wear curve will not flatten off as indicated in the accompanying diagram, but will continue its abrupt rise and probably following the characteristic of the curve shown in the illustration.

TIGHT BEARINGS MEAN LESS NOISE

Having shown that it is highly economical to keep bearings tight, let us look at another view of the question. We are all endeavoring to reduce noise in car operation. Loose bearings and worn gears are one of the greatest sources of noise, so high maintenance standards in these cases will do more to eliminate noise than any other single line of action. It may be argued that as long as we have to depend upon spur gearing or a low angle helical gear we will have noise. If present methods of gear cutting were the only ones in sight, this might be admitted, but fortunately such is not the case. Gearing is inherently quiet. It is inaccuracy of cutting that makes noise. It is predicted that within two or three years we shall be able to secure gears whose inaccuracy will be measured in ten thousandths of an inch instead of thousandths. With the advent of such gearing, we shall be able to obtain results in quietness hitherto deemed impossible. So it behooves us to bring up our standards of bearing maintenance to such an extent as to take full advantage of this perfected gearing when it arrives.

It is manifestly impossible to take up all of the details of car maintenance to which higher standards may be profitably applied. However, the line of reasoning developed in the cases which have been discussed applies to practically all wearing parts. It must not be thought that the advantages to be gained by the introduction of higher standards of maintenance can be obtained without cost. Far from it. First, it will undoubtedly call for an investment in machinery. If present machines are not in first-class condition and capable of doing accurate work they will have to be replaced. Special tools will have to be provided. Second, and more difficult, the mechanics will have to be trained to accommodate themselves to the new requirements. The ultimate savings which are bound to accrue will not be apparent until considerable time has elapsed. In other words, if a car is now overhauled on a basis of eighteen months and by improved methods this period can be extended to 24 months the savings will not be manifest until the eighteenth month. Consequently the adoption of such a plan requires foresight, confidence and courage. It is unthinkable that we should be content with present practices, because that would be to assume that perfection has been reached.

Modern Production Methods May Be Applied to Maintenance Work*

Introduction of Labor-Saving Machines and Time-Saving Methods Are Possible in Many Maintenance Operations—Workman Morale Must Be Built Up to Secure Results

By W. T. ROSSELL
General Manager Pittsburgh Railways

TRUE economy is what we are seeking. Better maintenance or less cost, or both, means cash, which can be used in any way we see fit. There is a close analogy between all forms of work. Whether we are maintaining cars or track or overhead lines, the underlying principles are the same.

If we look back ten years, improvement in methods is obvious. The same will be true ten years hence. We can hasten this change, but first we must admit honestly to ourselves that our present methods are not the best. We pride ourselves on the accumulation of knowledge the value of which sometimes passes as we acquire it. Experience may become an actual burden as it is always based on the past, whereas we must live and work in the future. It is not desired to belittle knowledge and experience, but to keep them to their proper functions. They are tools, nothing more. A machine or unit of equipment, crystallizing knowledge and experience as it does, becomes a liability as soon as further improvements are developed. So it is with the mind if we fail to seek new ways.

Some one has said that mental attitude is more important than mental capacity. Courage to act according to our convictions and courage to asume full responsibility for our actions is needed. Much of our progress is necessarily through trial and error. Analyze the maintenance problem—there are five definite parts: Supervisory force, workmen, machinery, materials, design. In addition there is a flexible force which pervades the whole. It is method or organization and it determines and controls.

MANAGEMENT FIXES THE VIEWPOINT

The supervisory force includes all who do not do the actual work. It is obvious that the mental capacity of these men from top to bottom is but average and is beyond control. Their mental attitude, however, can be controlled. Justice, opportunity, security, ambition, interest, vanity, all play their parts. Each man has but to recollect his past to understand. Here is the part of management. The subject is too wide to attempt a complete exposition. Favoritism, nepotism and harshness must go. Each must feel that he is judged solely on merit. We must "know no difference of race or creed." There must be a similarity of opportunity in different departments and groups. This is obtained through the plant of organization and the method of promotion. Wherever we find a position without opportunity, there we find a discontented man. See to it that the curve or per cent of opportunity is favorable to all. The individual must feel that if he performs well his position is secure. Due consideration must be given to the humanities, the ambition, the interest, the vanity of the individual. In a word the morale must be high. Here again is the part of management. Now, with a high morale, we must somehow keep all of these men discontented. One of the masters has called it divine discontent.

Through discontent comes progress. They must be discontented with methods and results. They must feel that each process can and must be improved, that each improvement is but a step toward a distant goal. This feeling must reach each one and the utmost freedom of thought and discussion must prevail. Any man's ideas are worthy of respect.

Each man in the supervisory force must be given a definite part and his title should so state. There should be no "assistants." An assistant is usually either a messenger boy or a member of the department office who does all the work, depending on the nature of his chief. Initiative and courage and self-assurance should be developed by judging results and not separate acts. Fear of criticism by superiors is a creeping paralysis which stifles all progress. Petty interference will do the same. We must recognize and overcome the tendency, which all have, to become satisfied, to get in a rut, to cease struggling, to let well enough alone.

In the case of workmen we may

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*Abstract of paper presented before Central Electric Railway Association, Toledo, Ohio, Feb. 4, 1927.

expect only the average. But the morale may be raised to the heights. All that has been said of the supervisory force is equally true of the workman. See that he understands what is being done and why. Encourage and praise him if he is doing well and talk frankly to him if he is not. Above all, see that he has a proper amount of work to do and that his work is geared to that of others. This gearing of one man's work to that of others brings a proper pride and feeling of responsibility that will cure much indifference and idling. If work slows down, it is quickly shown who is at fault and how.

LABOR-SAVING MACHINERY ELIMINATES DRUDGERY

Upon the introduction of labor-saving machinery depends much of our hope. The elimination of drudgery and the raising of the productivity of the individual will come about more through the use of machinery than in any other way. Both selfish interest and common interest call for the use of more and more machinery.

For proper maintenance results, materials should be of proper quality of course, and the utmost care should be taken to assure this. Even more important, however, the flow of materials to the work should be regular and ample. For mass production this is essential. An investigation of the methods of leaders in manufacturing will convince any one of this. A shortage even of unimportant items may prove very costly.

In general, we inherit design and must make the best of it. It is usually very faulty as it is of the past. We may cure minor and glaring faults slowly, but in general we cannot greatly change the equipment on our hands. However, we can and should call the attention of manufacturers to faults. In general, it is the duty of manufacturers and not that of operators to improve design.

ORGANIZATION INCREASES PRODUCTION

It is through method or organization that we may attain what is known as mass production. Its application to maintenance differs from its application to manufacture only because the former is partially repetitive and the latter is entirely repetitive. This gap is bridged by three steps: First, the unit to which the repairs are made is separated from the whole and then dealt with as a complete unit; second, pools of assembled units, partially assembled units and separate parts are maintained and located between each work step and the next; third, the repair is made rather complete, that is, parts are replaced which still have some life.

This last rule covers both small and large units and may be called the overhaul method. All of these processes, however, still lack some of the efficiency which may be attained in manufacturing where exactly the same thing is done over and over.

Now, we have many examples of what to do. A spy tells me that the Ford plant is well worth investigating.

Broadly, we are endeavoring to obtain satisfactory results with as little work as possible. The mechanical equation of work is — force × distance = work. It is obvious that the only way to decrease work is to decrease force or distance or both. Consideration will show us that cost of force varies greatly and that the equation may be restated. Cost of unit of force over unit of distance × force × distance = cost of work.

The cost of a unit of force over a unit of distance at once suggests cranes, tractors, grinders, and other machinery of all sorts. It also introduces the economic problems which go with the use of machinery, such as its utmost use, depreciation, etc. It is usually cheaper to apply a greater force once than to apply a lesser force many times. So we get mass handling of material. Specialization is also suggested as different grades of labor differ in cost. There are ways of reducing the amount of force through more efficient machines and better lubrication. Improved methods of using levers, wrenches and other tools by workmen will also reduce this factor.

The reduction of distance leads the way to centralization, specialization and routing of work, materials and tools. When a workman lifts or sets up a tool, performs one operation and then goes to something else, the lost motion becomes obvious. Examples are all about us, and if we have builded our organization well and will keep its aims high, we cannot fail in our purpose of applying modern production methods to maintain work.

Illinois Association to Meet March 17-18

ILLINOIS Electric Railway men will meet jointly with the state gas and electric associations at the eighteenth annual convention to be held on March 17 and 18, at the Hotel Abraham Lincoln, Springfield, Ill. According to an announcement by Secretary E. V. Prather, the Central and Western Passenger Associations have granted reduced fares—1½ fare for the round trip —over all steam roads in the state, and this same reduction has been made by the Illinois Traction System. He also suggests that hotel reservations be made direct with the hotel.

Papers to be presented before the electric railway association are as follows:

"Traffic Regulation and Relation to Street Car Operation," by E. J. McIlraith, staff engineer Chicago Surface Lines.

"Track Maintenance," by Jonathan Wolfe, assistant supervisor of track and roadways Chicago Surface Lines.

"Handling L.C.L. Freight by Truck vs. Railroads."

"Advantages to the Public of One-Man Car Operation in City Service," by R. F. Palmblade, manager Peoria Railway.

"Car Construction," by M. J. Oswald, sales representative St. Louis Car Company.

"Bus Maintenance," by H. P. MacDonald, superintendent of automotive equipment East St. Louis & Suburban Railway.

There will also be two morning joint sessions on public relations, finance, terminable permits and public utility information.

Automotive Engineers Discuss the Bus

THE place of the motor bus in urban transportation was the subject of a meeting held by the Metropolitan Section, Society of Automotive Engineers, in New York on the evening of Feb. 17.

Speaking with a background of more than five years experience in bus operation, R. N. Graham, manager of railways Pennsylvania-Ohio Edison Company, presented a carefully prepared analysis of the part the motor bus may be expected to play in the transportation scheme of the country. Mr. Graham spoke not as a railway man, but as a transportation man interested in finding the place of each form of vehicle which is available for transportation purposes. An abstract of his talk will be published in next week's issue of the JOURNAL.

Both automotive and electric railway men took part in the discussion. Adrian Hughes, Jr., manager Baltimore Coach Company, said that progressive transportation men today have no prejudice against the automotive vehicle. If there was such prejudice when the bus first made its appearance, the speaker explained, it was the natural result of the unfair conditions under which a great many original competitive bus lines were started. He held to the view that the application of buses as a part of the transportation systems of modern cities should be dictated by the economics of each situation. He said that the study of the matter of how best to use the motor bus, and the analysis of the factors which determine the proper vehicle to use under each given set of conditions, is considered by progressive transportation men to be one of the major problems of the industry.

Gas-electric drive for buses, effect of power brakes on tire wear and one-man operation of double-deck vehicles were phases of the subject discussed by other speakers.

American Association News

T. & T. Executive

PROGRESS reports of committee chairmen occupied the greater portion of the time at the meeting of the executive committee of the T. & T. Association held in Toledo, Ohio, on Feb. 4. R. N. Graham, chairman of the committee on bus operation, indicated substantial progress of the work which has been undertaken. S. E. Emmons reported on the work of the service betterment committee, in which much new work is being undertaken. In the absence of Chairman C. H. Evenson, Samuel Riddle reported on the work of the traffic and safety committee, which is being conducted jointly with the claims association. This committee recently reviewed the conditions of the Anthony N. Brady Award and agreed with Chairman Thomas Fitzgerald of the American Association committee on a revised set of conditions to be offered to the American Association and the American Museum of Safety. A subcommittee was appointed to co-operate with the electric railway section of the National Safety Council in preparing a revised classification of accidents.

President Sullivan appointed two new committees. The one on convention program consists of W. H. Boyce, chairman; Paul Wilson and A. R. Myers. In addition to preparing the program for the T. & T. Association, this committee was also instructed to get in touch with President Proctor of the Claims Association regarding arrangements for a joint session for the presentation of the report of the joint committee on traffic and safety.

A committee on subjects for next year's work was also appointed, consisting of Edward Dana, chairman; Samuel Riddle and G. B. Anderson. This committee is to consider the results of this year's work and make recommendations for the work of the committees for next year, also taking into consideration whether committees on entirely new subjects should be appointed and some of the present subjects dropped.

It is planned to have the next meeting early in July after the reports of the standing committees have been presented. The date and location will be announced later.

President Sullivan appointed a committee on resolutions on the death of E. M. Walker, late president of the Schenectady Railway. This committee, consisting of Paul Wilson, Edward Dana and Samuel Riddle, was instructed to draft suitable resolutions and submit them for presentation at the convention and inclusion in the Proceedings. A letter of appreciation from Mrs. Walker for the floral tribute sent by members of the committee was read.

Those present were President J. V. Sullivan, Edward Dana, W. H. Boyce, Samuel Riddle, A. R. Myers of the executive committee; Committee Chairmen S. E. Emmons, R. N. Graham, and J. W. Welsh and G. C. Hecker.

Depreciation

POSTPONEMENT of the Interstate Commerce Commission hearing scheduled for Feb. 28 on depreciation, Docket No. 19157, until May 23, 1927, was obtained by Lucius S. Storrs, managing director of the American Electric Railway Association. This change was announced to the sub-committee on depreciation of the national relations committee at a meeting held in New York, Feb. 17, 1927.

Electric railways which report to the Interstate Commerce Commission will be interested in the course events are taking with respect to the impending order of the Interstate Commerce Commission in the matter of entering an order prescribing a system of depreciation accounting for electric railways substantially the same as that entered recently with respect to depreciation charges of steam railroads. Before considering the proposed order it was the idea of the commission to hold a hearing on Feb. 28 at Washington, D. C., before Examiner Bunton, at which those concerned were to have an opportunity to testify.

It was decided that the committee would present the case of the electric railways showing that the situation of the industry was essentially different from either the steam railroads or the telephone systems. Only a few of the electric interurbans and still fewer city systems come under the Interstate Commerce Commission jurisdiction. The assumption is, however, that many state commissions may follow the example of the Interstate Commerce Commission if the national commission should promulgate this change in the depreciation system. The committee recognized the isolated character of electric railways. This and the widely different conditions of finance, earnings, and competition with automobiles was considered of such importance that no standard rule of depreciation could be made effective with justice to all.

The committee outlined a program to collect data and prepare a comprehensive study of the industry. Obtainment of outside counsel to help present the case scheduled for May 23 was agreed upon.

Those of the committee present were: J. H. Hanna, chairman; Thomas Conway, Jr., F. W. Doolittle, W. F. Ham and C. R. Mahan representing C. E. Thompson. In addition Charles L. Henry, Lucius S. Storrs, J. W. Welsh and other members of the association staff attended.

Education

IMPORTANT plans were approved for further development of foreman training and study of the training of platform men at a meeting of the American Association committee on education, held at Toledo immediately after the annual convention of the C.E.R.A. This meeting followed correspondence among the committee members as to the best procedure for the current season and it proved successful in bringing out constructive suggestions.

In attendance at the meeting were these committee members: Edward Dana, chairman; H. H. Adams, W. H. Boyce, F. H. Miller, H. H. Norris and A. J. Sarré. M. B. Lambert was represented by A. B. Gibson and J. A. Dewhurst by Charles Gordon. Guests present by invitation included J. W. Colton, Prof. D. D. Ewing, E. P. Waller and Adolph Schlesinger, all of whom have shown keen interest in the work of the committee.

Discussion on the foreman-conference movement showed a lively interest on the part of railway managers and the need for some definite plan for training foreman-conference leaders. The series of conferences preceding the demonstration at Cleveland was believed to be a step in this direction. The subject is so large, however, that it was referred to a sub-committee, as follows: Mr. Dewhurst, chairman, and Messrs. Lambert, Boyce and Sarré. This committee will consider all possible methods of training, including the holding of a series of training conferences at the Cleveland convention this year. If such a series is planned it is understood that the sessions will occupy only a half day each.

The training of transportation employees was taken up in some detail, with the result that a sub-committee on this subject was appointed also. Dr. Rowland will be chairman, and Messrs. McCants, Adams and Hyatt will complete the committee. This committee will report on the general situation in this field with the possibilities of effective work in the field by the committee.

A third sub-committee was appointed to bring about greater publicity for the educational work of electric railways. The committee comprises Mr. Norris, chairman, and Messrs. Boyce, Dewhurst and Burke.

It was deemed necessary this year to send out a questionnaire to gather facts on educational activities in the industry, but this will be so worded as to call for a minimum of time in the compilation of the replies. The committee will also bring up to date the bibliography on educational work which formed an appendix to the report for last year.

In the interest of conservation of time and energy at the disposal of the committee it was decided to omit the educational exhibit at the 1927 convention and to concentrate upon the phases of the work assigned to the sub-committees named. As a guide to future activities a chart will be prepared showing the ramifications of educational and training work on an electric railway property. Thus the committee this year and later will have a guide by which to prepare its plans, taking up at one time only those lines of work that are timely and promising.

Bus Operation

GENERAL discussion of various phases of operation was participated in by the members of the committee on bus operation of the T. & T. Association at its meeting held in Toledo, Ohio, on Feb. 3. A check-up was made of the replies to the questionnaire which was sent to 51 companies. It was found that nineteen companies had been heard from. It was decided that the chairman would follow up the members responsible and attempt to get the data all in within the next two weeks.

Progress was reported by the sub-committee chairmen on the four subjects which are being studied. Much of the work is awaiting the tabulation of material from the questionnaires.

It was decided to hold the third meeting of the committee in Chicago, Ill., on April 8 at 9 a.m. Central Standard time, the meeting place to be arranged for by B. W. Arnold.

Those present at the meeting were Sponsors Paul E. Wilson and A. R. Myers, Chairman R. N. Graham, D. L. Fennell, S. W. Greenland, M. L. Harry, Adrian Hughes, Jr., D. S. Mackay, Thomas Noonan and D. A. Scanlon, members, and G. C. Hecker, R. E. Plimpton, W. W. Holden, C. D. Smith and R. F. Palmblade, guests.

The News of the Industry

$750,000 for Rehabilitation in Phoenix

The City Commission of Phoenix, Ariz., has unanimously approved an ordinance calling for a special municipal election on March 12, at which the public will be asked to approve an issue of bonds totaling $750,000 for the purchase of new cars, rails, ties and other necessities for bringing the present municipal railway up to date. The ordinance calls for the rehabilitation of the entire system, including the Washington Street, the Brill, the Indian school, the Grand Avenue, the Kenilworth and the Hollywood lines.

The ordinance adopted by the commission asks approval of the issuing of 750 bonds of a denomination of $1,000 each. The bonds are to bear interest at a rate not exceeding 5 per cent per annum, payable semi-annually, maturing at the rate of $30,000 annually, over a period of 25 years beginning in 1932. Under this plan the system will be operated for a period of five years before the sinking fund begins to operate.

Parking Regulations in Philadelphia Opposed

Hardly had the enforcement of the new parking regulations in Philadelphia been in effect when a demand was forwarded to the Mayor and Director Elliott for their modification. In a set of resolutions the Market Street merchants asked for half-hour parking, claiming that the restrictions are driving trade away. So far has the protest gone that an ultimatum was delivered to the city administration on Feb. 11 by the Market Street Merchants' Association stating that unless the parking ban on Market Street was modified the association would file an injunction demanding enforcement.

In response Director Elliott has told the Market Street Merchants' Association that he would fight all attempts to modify the anti-parking ordinance until it has had a fair trial. His attitude met the approval of several traffic organizations and officials, including the traffic committee of the Chamber of Commerce and Kane S. Green, president of the Automobile Club of Philadelphia. Director Elliott told the representatives of the association that he would make no change in the regulations until all the "no parking" signs had been erected and the ordinance had received a reasonable test. Then he and Superintendent Mills would report to the City Council.

When the parking bill was signed the warning signs were still in preparation. Under the ruling of the court these signs are a necessary preliminary to the enforcement of the rule. The recent parking regulations have been referred to before in the ELECTRIC RAILWAY JOURNAL.

The latest move on the part of the Market Street Merchants' Association was the drafting of a parking bill on Feb. 15, the third ordinance since the anti-parking dispute. Two of the ordinances providing for restricted parking in the central city district were introduced in the Council on Feb. 17. Director Elliott refused to comment other than to say that enforcement of the parking ban was uppermost in his mind.

One-Man Car Right Sustained

Toronto Transportation Commission Wins Point Over City's Complaint—Review of the Situation in Canadian City—Amalgamated President Defends New Equipment

BY JUDGMENT of the Ontario Railway Board, the application brought by the city of Toronto to restrain the Toronto Transportation Commission from using one-man cars has been dismissed with costs. The decision was based upon an investigation conducted by its officers which resulted in the finding that accidents occurring with one-man cars could not have been prevented by the two-man type. Vice-Chairman Ingram said:

> If the people of Toronto are dissatisfied with the one-man car it is their duty to present their feelings to the Transportation Commission. It has not been shown that there have been accidents due to this type of car, and that is the only phase in which we are interested.

During the hearing of the application it was contended by Controller MacGregor that the opinion of the City Hall was unanimously in favor of the removal of the one-man cars. This statement, however, was sharply challenged by I. S. Fairty, K.C., counsel for the Transportation Commission, who stated that Controller MacGregor did not represent the unanimous opinion of the City Council, and could not get such a motion through if he wanted to. Mr. Fairty objected to statements made by Controller MacGregor during his election campaign, characterizing these as "reckless and wild."

Mr. Fairty declared that it would have been much more sporting for the city to have gone to the Toronto Transportation Commission and asked it to abandon the one-man cars than to apply to the board. He regretted that much election propaganda had been spread on the question. The commission, he said, had spent thousands of dollars in remodeling cars with the approval of the Board of Control.

CONTROVERSY IN MONTREAL

Agitation in Canada against the use of the one-man car was not confined to Toronto. The Montreal Trades and Labor Council's objection to the one-man cars was expressed in a resolution passed on Nov. 4. A copy of the resolution was sent to the Montreal Tramways management, accompanied by a letter which said in part:

> We hope you will give the resolution deserved consideration, as this is a vital question in the interest of the Montreal public, and, as a public body, we would like to have an opportunity to discuss this question with your company.

Julian C. Smith, president of the Montreal Tramways, replied in part:

> We believe that further study of the situation will convince you of the material benefits which the community gains through the operation of the one-man cars. We will be very happy to discuss the situation with you, and if you will advise me when it will be convenient to meet yourself and any other representatives of the Montreal Trades and Labor Council at the tramway offices, I will be glad to arrange to have with me some of our people who can discuss intelligently the features of the one-man cars that you refer to.

The Trades and Labor Council also sent its resolution to the Montreal Tramways Commission, and it received a letter from the commission about the same time as it received Mr. Smith's. The Trade and Labor Council considered these communications, and one-man car operation generally, at a meeting late in Nov., 1926, and reports indicated that the discussions were, in the main, far from harmonious. It was decided that no delegation should be sent to consult with the tramway management, on the ground that the company is not a controlling body, and that action to be taken on the commission's communication should be left to the Council.

The Trades and Labor Council's president, Mr. Foster, was very critical of the tramway union. It was a strange thing, he said, for the tramway union to denounce one-man cars and ask the T. and L. Council to do the same and then send a delegation on a tour to determine if its criticisms were correct. He felt that the union might have made sure that one-man cars are undesirable before asking the T. and L. Council to go on record against them.

Julian Smith, a few days later, stated that the protests against one-man car operation had been made before the equipment had been given a fair trial. He said that the fears held by labor that one-man car operation would reduce employment were groundless and pointed out that the fact of one-man cars constituting 30 per cent of the street cars operating in North America would indicate that they had merit.

He said the company had no desire to force on the public something it does not care to engage in any controversies.

not want, and that the one-man cars were introduced solely in keeping with the company's policy to give the public the best service possible.

G. Gagnon, president of the Montreal Tramways Employees' Union, was unable to accompany the delegation appointed to inquire into one-man operation in other cities and was replaced by R. Trepanier. Messrs. Trepanier, Champagne and Manion visited Detroit, Toledo, Cleveland, Pittsburgh, Trenton, Youngstown, Elizabeth, Scranton, Newark, New York, Bridgeport, Philadelphia, Albany and Troy in the latter part of November and their report was considered at a union meeting on Dec. 1.

It stated that one-man car operation was practically universal in all the cities visited, and of even greater importance, it indicated that informed people everywhere, inside the electric railway and outside of it, are convinced of the desirability of one-man cars and of their safety and economic value.

In Detroit the delegates met W. D. Mahon, president, and W. B. Fitzgerald, vice-president of the Amalgamated Association of Street and Electric Railway Employees of America, who impressed upon them their view that the one-man car is a modern development and a natural outgrowth of the march of progress; that its coming was inevitable, and that controversy in regard to its use has been settled by the courts in its favor, and, finally, that one-man car operation has not been injurious to the employees' interests.

The delegates suggested to Mr. Mahon that possibly the Montreal Tramways was violating the contract with its employees in placing one-man cars in operation, but their attention was called to a clause in that contract stipulating that one-man car operators are to be paid 5 cents an hour extra, implying that when the contract, all the conditions of which the men accepted, was entered into, operation of one-man cars had been in view.

The union's chief executives acquainted the delegates with the fierce competition electric railways have had to face, and with the fact that one-man cars constitute one of the best weapons the electric railway management have to meet that competition and hold their traffic. It is probable that at the end of the interview the delegates had come to a realization of the fact that the one-man car is just as beneficial to the electric railway employees, as a class, as to any one else.

Japanese Railway Representative Visits America

Gitaro Ishida, assistant to director of the Japanese Government Railways, Kobe region, is making a tour of the United States to study transportation methods more particularly in the electric railway and bus fields. Arriving in California on Nov. 14 he spent a week making observations in San Francisco and a month in Los Angeles and its vicinity. He is now in New York and will remain there until Feb. 20, when he will depart for a visit to various Western cities. He plans to see Philadelphia, Cincinnati, St. Louis, St. Paul, Minneapolis, Chicago, Detroit and Cleveland.

Hearing in Oakland Postponed

Pending the completion of an inventory and valuation of the company's properties, the hearing on the application of the Key System Transit Company for adjustment of rates was postponed on Feb. 1 by the California Railroad Commission until May 10. It is expected that the valuation survey will be completed by April 15, thus giving the experts time in which to check over their figures.

This valuation is of Dec. 31, 1926. It is based on unit prices over a three-year period ended June 30, 1926. In addition to a reproduction cost at new and at present values and a reproduction cost new less depreciation, a historical reproduction cost value will be made.

At the Feb. 1 hearing in Oakland, Herman Phleger, counsel for the Key System, filed a report which showed that despite a temporary increase in revenue granted by the authority of the Railroad Commission on Dec. 31, 1925, the additional revenue has fallen short of expectations.

When the 7-cent railway fare and the 21-cent ferry fare were officially authorized it was estimated by experts of the Railroad Commission that the company would require $800,000 additional revenue in 1926 to obtain the finances necessary to make improvements and to cover the $400,000 wage increases.

Mr. Phleger, in his report, pointed out that the revenue of the company in 1926 exceeded that of 1925 by $277,000 and that bond interest paid in 1926 exceeded that paid in 1925 by $125,857. During 1926 the company spent $4,549,196, made up as follows: Cars, $940,646; automotive equipment, $198,901; boats, $1,794,977; service equipment, $99,436; way and structures, $1,515,235.

The money for these improvements was obtained through the issue of the following securities: First mortgage 5½ per cent bonds, $2,500,000, an annual charge of $137,500; first mortgage 6 per cent bonds, $1,500,000, an annual charge of $90,000, and equipment trust 6 per cent bonds, an annual charge of $93,500.

The company is proceeding with the formulation of plans for changes in its pier, the report declares, and its officers are conferring with the city of Oakland regarding the making of a solid fill, but in view of increased operating costs in 1926 and the insufficient increase in revenue it has not been possible to do any work on the pier "and it will not be prudent to attempt to do so until the finances of the company are in better condition."

The two new ferryboats now in course of construction at an Oakland shipyard will be ready for service early in March.

Pennsylvania Railroad Talks of a Future Power Plant

An announcement made at Philadelphia by the Pennsylvania Railroad on Feb. 10 said that conferences had been held between the officials of the Pennsylvania Railroad, Philadelphia Electric Company, Philadelphia Rapid Transit Company, Public Service Corporation of New Jersey, Philadelphia Suburban Gas & Electric Company and Counties Gas & Electric Company (the latter two being subsidiaries of the United Gas Improvement Company) looking toward the construction of a power plant of sufficient capacity to provide for the rapidly increasing needs of these properties, especially for 25-cycle energy. In printing this announcement the newspapers said that the site of the plant would probably be on the Delaware River near Trenton, N. J.; that it would cost about $10,000,000, and that the power generated would be applied in extending the electrification of the Pennsylvania Railroad. Contradictory reports concerning the conferences, however, at once followed, the Philadelphia Electric Company and the Philadelphia Rapid Transit Company denying that they had taken part in such negotiations. A five-year contract between the Philadelphia Electric and the Philadelphia Rapid Transit for the supply of power to the latter will expire in the spring.

Status of Winnipeg Franchise

There have been no new developments in the Winnipeg electric railway franchise situation. The City Council had the right under the original contract made 35 years ago to take over the system in 1927 at its physical value by giving the company six months notice of its intention to do so. Such notice would have had to be given not later than Aug. 8, 1926. The City Council failed to give this notice and consequently the franchise is automatically extended for five years dating from Feb. 8, 1927. The right of the city to take over the system recurs every five years from now on.

New Ticket Rates in Tacoma

Tickets good for six rides, with transfer privileges, on all lines of the Tacoma Railway & Power Company, Tacoma, Wash., will be sold on street cars, effective Feb. 8, 1927, for 50 cents. This new fare does not replace either the token or the 10-cent cash fare offering similar riding privileges. The 5-cent inner zone fare will likewise remain.

Decision to institute the new fare was reached after conferences between city officials and members of the City Council. The new fare is simply another experiment designed to provide still further evidence of what is desired by the riding public, and how the necessary amount of revenue can best be obtained. Offer of the new fare came from Richard T. Sullivan, manager of the railway. It will give a fare of 8⅓ cents for riders who do not care to invest $1 in tokens, or who do not find it convenient to go to one of the regular token-selling places. The wide difference between cash fares at 10 cents and the token at 6⅔ cents has led many people who would otherwise not bother with tokens to purchase them, Mr. Sullivan states. The new ticket fare will practically restore the former 8-cent cash fare.

Report of the railway for December, with about ten days under the zone system included, showed an increase in gross earnings but a decrease in earnings per mile.

New York City's Transit Bills Introduced

Bills embodying the New York City administration transit program were introduced in the Senate and Assembly on Feb. 17 by Minority Leaders Bernard Downing and Maurice Bloch.

One bill amends Sections 32, 39, Chapter 4, laws of 1891 (New York City rapid transit act) by authorizing acquisition of any railway by eminent domain in the event that terms and conditions may not be agreed upon between the board or commission representing city and owners or operators of the railway.

A second measure amends Section 11, city home rule law, by empowering local legislative body of city to enact laws for ownership, establishing, construction, acquisition and operation of municipal bus and trackless trolley lines.

A third measure adds new Section 134-a to the Chapter 480, laws of 1910, public service commission law, giving the Board of Transportation such additional powers and duties as may be conferred by local legislative body of city under the city home rule law.

A fourth bill amends Section 134, public service commission law, by stripping the Transit Commission of all powers except that relating to the rapid transit readjustment plan and conferring such powers on the transportation board.

The fifth bill adds new subdivision 12, Section 49, public service commission law, by authorizing any municipality to cancel a contract, franchise or certificate for privilege of transporting passengers or property if lessee, operator or grantee thereunder shall petition, or accept the benefit of the exercise of, the powers by the commission in altering, changing or modifying the rate of fare fixed in contract.

Another Finding in Superior

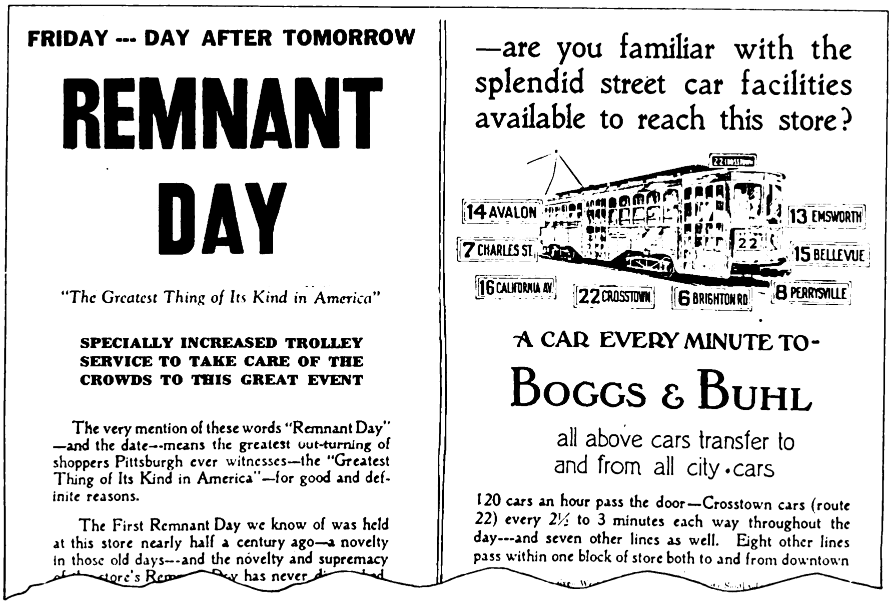
A coroner's jury exonerated the one-man street car operator, grade crossing switchman and train engineer of all blame for the street car-passenger train crash at Superior, Wis., on Jan. 6. The Duluth Street Railway was censured because of the use of one-man cars at this dangerous point, negligence was charged on the part of the Railroad Commission because it refused a previous petition for extension of a viaduct over the tracks where the accident occurred, neglect was intimated in the case of the Great Northern Railroad for allowing its trains to operate at an excessive rate of speed over the crossing, and negligence was charged on the part of the Northern Pacific Railroad because the gates at the crossing had not functioned properly at the time of the accident.

Department Store's Full-Page Ad Features Pittsburgh Service

One of the most remarkable examples of the co-operation between the Pittsburgh Railways, Pittsburgh, Pa., and other interests of the community is the full-page advertisement which Boggs & Buhl ran in the Pittsburgh newspapers on Jan. 19 to feature their annual "Remnant Day." The announcement was repeated the next day, but in smaller space.

The Boggs & Buhl department store is on the so-called Allegheny side of the city and therefore not in the general metropolitan shopping area of Greater Pittsburgh. On that account many Pittsburgh prospects must figure on using transfers.

To offset the disadvantages of location, Boggs & Buhl have worked in closest harmony with the commercial department of the Pittsburgh Railways to assure ample service for their patrons. Their annual "Remnant Day" is a really big feature in Pittsburgh's retail merchandising and the Pittsburgh Railways made every effort to see that ample service would be provided. In turn, Boggs & Buhl showed their appreciation by featuring the electric railway more than the sale itself. The motto seems to have been: "Get 'em on the cars first and the sale will take care of itself." The full-page advertisement was concluded with the slogan: "The Weekly Pass Is a Wise Investment."



FRIDAY — DAY AFTER TOMORROW

REMNANT DAY

"The Greatest Thing of Its Kind in America"

SPECIALLY INCREASED TROLLEY SERVICE TO TAKE CARE OF THE CROWDS TO THIS GREAT EVENT

The very mention of these words "Remnant Day" —and the date—means the greatest out-turning of shoppers Pittsburgh ever witnesses—the "Greatest Thing of Its Kind in America"—for good and definite reasons.

The First Remnant Day we know of was held at this store nearly half a century ago—a novelty in those old days—and the novelty and supremacy store's Rem Day has never

—are you familiar with the splendid street car facilities available to reach this store?

A CAR EVERY MINUTE TO—

BOGGS & BUHL

all above cars transfer to and from all city cars

120 cars an hour pass the door—Crosstown cars (route 22) every 2½ to 3 minutes each way throughout the day—and seven other lines as well. Eight other lines pass within one block of store both to and from downtown

Upper Half of Pittsburgh Ad—Lower Half Listed Routes

New Name for Inland Empire Under Great Northern Control

After announcing that the properties of the "Inland" and allied interests, recently purchased by the Great Northern Railroad, would be known hereafter as the Spokane, Cœur d'Alene & Palouse Railway, officials at Spokane canceled this new name and have made plans to have the name changed legally to the Spokane & Idaho Northern Railway. Approval of the transfer of the properties to the Great Northern is now pending before the Interstate Commerce Commission.

Commercial organizations in towns of the Idaho panhandle requested the Spokane & Idaho Northern title based on grounds that the name Spokane has always been used in the several titles which these roads have borne, and because the name of the state of Idaho has not been properly recognized and used by business interests. The second change in names was made largely in deference to the wish to foster a spirit of good will.

The properties to be purchased by the Great Northern consist of electric interurban lines out of Spokane, most recently known as the Spokane & Inland Empire Railroad, to Moscow, Idaho, and the Spokane & Inland Empire, operating to Cœur d'Alene, Idaho.

Suburb Agrees to Cleveland Railway Plan

According to the Cleveland *Plain Dealer* the second long step in carrying out the metropolitan traction program for the Cleveland Railway system has been taken by the Cleveland Heights Council. The program was submitted in June, 1925. The Cleveland Council approved it in April, 1926. Now the Heights acts more than eighteen months after the commission finished its work. East Cleveland and Lakewood have yet to act.

The new franchise shows the fruits of negotiation. The company wins the one concession which the metropolitan commission considered essential to the plan; that is, the suburb agrees to pay a fare 1 cent above what city passengers pay. In return for this the company agrees to build extensions on Mayfield and Cedar Roads and to establish a bus line on Fairmount Boulevard. These terms must have the approval of the Cleveland Council, but no difficulty on that point is anticipated. The community now awaits action by Lakewood and East Cleveland.

"No Accident" Reward Plan in Trenton

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has put into effect a "No Accident Bonus Plan," whereby a bonus of $1 a week will be credited to each operator with a clear accident record during that week. Payments of bonus will be made in a lump sum covering four weeks. To be eligible to receive the weekly credit the operator must work at least five days of the week, a regular man must total at least 40 hours and an extra man at least 35 hours.

Notes from Knoxville on Fares and Threatened Bus Competition

C. H. Harvey, president of the Knoxville Power & Light Company, Knoxville, Tenn., says that the new fare arrangement put into effect on Jan. 3, consisting of the sale of weekly passes at $1.25 per week, five tokens for 30 cents and single cash fare of 10 cents, has met with very general public approval, and that the company has had many letters of commendation and oral comments on the convenience of the pass, the purchasers finding so many different ways that the pass can be used to advantage. He feels, however, that the question of whether or not this new system is going to be satisfactory to both the public and to the company can be determined only upon further trial.

In this connection it is of interest to note that the application made some time ago by the Knoxville Rapid Transit Corporation for a franchise has been revived and that early action by the Council has been requested. The position of the Knoxville Power & Light Company with respect to this matter is that the granting of this general franchise for bus operation is undesirable because there is no necessity for the general installation of bus routes in the city and because this kind of competition is ruinous and against the public interest. The Knoxville Power & Light Company has been willing, and is willing, to install and operate buses where and when this service is necessary and bears promise of resulting in a reasonable profit. The position of the company is that it would undoubtedly be in the interests of Knoxville to have any buses installed operated by the utility in conjunction with its street railway system, but it feels this should not be required of the company until the public convenience and necessity is sufficiently great as to justify it.

"Ride in the Street Cars" in Seattle

Plans to make the week of Feb. 21-28 in Seattle, Wash., a "Ride in the Street Cars" week, during which every one will be urged to use the street cars and help put the system on a paying basis, have been adopted by a newly organized "Ride in the Street Cars" Club, in which is represented service clubs, commercial clubs and improvement clubs. All other clubs in the city will be asked to get behind the movement and line up the people in their localities, so that the receipts of the week will help materially in getting the railway back on a cash basis. A speakers' bureau is being organized to cover club meetings for the next three weeks. Automobile owners will be asked to favor the cars for one week, refrain from picking up passengers and give the cars all possible patronage. Clifford Wiley, chairman of the club, states that the movement is in nowise directed against the automobile. He asserts that the fact that practically every club member owns a car does not relieve him of the responsibility of supporting the municipal railway as much as possible.

News Notes

Would Grant Right of Eminent Domain to Interurbans.—The North Carolina Senate has passed and sent to the House a bill to allow interurban railways to do business in the state and to give them the right of eminent domain.

New Franchise in Leavenworth.—Officials of the Kansas City, Leavenworth & Western Railway and the City Commission of Leavenworth, Kan., have agreed upon the terms of a new twenty-year franchise for the railway to operate over city streets.

Fare Increase Proposed in Williamsport.—Little more than a week after the Public Service Commission approved the merger of four railway companies in Williamsport, Pa., the consolidated concerns known as the Williamsport Railways filed a new tariff, increasing the present rates. Under the new schedule, announced by the commission, the present fare of 5 cents would be raised to 8 cents with two tokens for 15 cents. The increase becomes effective March 1.

Fourteen Men Have Perfect Record.—Throughout the year ended Dec. 31, 1926, fourteen employees of the Tide Water Power Company, Wilmington, N. C., held a perfect safety record. During this time they operated cars over the system without a single accident being charged against them. The total car mileage operated during the year was 738,000 miles.

Must Preserve Safety Rules.—Orders have been issued by the Board of Public Utility Commissioners of New Jersey for the Ocean City Electric Railroad, Ocean City, N. J., to improve service over its lines. After investigation the board stipulated that all one-man cars should have properly controlled doors and folding steps, rear doors for emergencies, automatic signals to notify operators when the rear doors are opened and a signal system to enable passengers to notify the operator to stop the car.

All One-Man Cars in Rockford.—The Rockford Public Service Company, Rockford, Ill., which recently acquired the Rockford traction interests, introduced one-man cars on all its lines on Feb. 15. Inclusion of the one-man car clause in the franchise to the new company was considered one of the outstanding features of that grant.

Fine Accident Record in Kansas City.—The 1926 accident record of the Kansas City Public Service Company, Kansas City, Mo., is one of the most impressive the trainmen of the company have ever made. During the year 681 trainmen operated day in and day out without having an accident of any kind for which they were responsible. Motorman J. D. Shepard of Ninth and Brighton headed the list.

Will Look Into One-Man Operation.—City officials of Portland, Ore., recently started an investigation to determine whether the one-man street cars on Broadway Avenue, operated by the Portland Railway & Light Company, at night interfere with traffic. If they do the company will be "invited" to discontinue that sort of operation. The question has also been raised as to the one-man operation of cars on other heavily traveled lines, and the whole question may be considered by the Council at an early hearing. City officials are resentful, it is stated, over the fact that the change in operation had been made without consulting the City Council or traffic department.

Safety Course in Session. — The Beaver County Section of the Western Pennsylvania Safety Council announced the third annual safety lecture course from Jan. 6 to Feb. 24, 1927. The sessions are held every Thursday evening from 8 to 9.30 in the auditorium of the Carnegie Library. This is a course for foremen, superintendents, employers, employees and others interested in the prevention of accidents in the home, the streets, the factory, the mine and mill. In connection with the course H. O. Allison of the Beaver Valley Traction Company invited the trainmen and coach drivers of his company to be present at the lecture on Feb. 3.

Tokens in Seattle Stores.—Tokens for use on the Seattle Municipal Railway, Seattle, Wash., will be sold at all downtown stores beginning Feb. 8. This is part of the plan to speed up cars and reduce operation costs, relieve traffic congestion by quicker loading, and provide a service to the rider. All downtown stores have agreed to co-operate with the railway officials and have offered to make special displays of the tokens, including window displays, to attract customers' attention. Cards have been printed and will be displayed on the cars urging patrons to buy their tokens before getting on the cars. One of the slogans is: "A token in the hand saves time."

Fire Insurance on Railway Property.—The Detroit Street Railway Commission at its meeting on Jan. 25 voted to take out $5,000,000 in blanket fire insurance on municipal railway property and to distribute the insurance equally among six agencies and companies. Sixty-eight bidders were reported, the successful ones selected by the commission being Johnson & Higgins, Willett & Hughes, Michigan Insurance Agency, John A. Parks Company, Edward T. Fitzgerald and Gorman & Thomas.

Commission's Order to Stand.—Under a stipulation filed, the Public Service Commission on Feb. 11 discontinued the proceedings instituted by the Mayor of Elmira, N. Y., against the Elmira Water, Light & Railroad Company over rates charged by it for gas and electricity and street railroad transportation, and permitted the withdrawal of the complaints and cross-complaints. The order provided that nothing therein contained shall affect or impair the order of the commission on May 7, 1925, authorizing a maximum street car fare of 7 cents in Elmira, and the tariff filed under this order is to remain in full force and effect. Commissioner Van Namee said that an increase in rates would be necessary if the company were to obtain anything like a fair return on the value of its property.

Recent Bus Developments

Bus Substitution Considered on New Jersey Interurban

Because of the bad condition of paving on a number of streets over which the Morris County Traction Company operates in Essex and Morris Counties in New Jersey proposals have been made that car service be discontinued and bus service started in its place. The main line of this railway is between Lake Hopatcong and Maplewood, where connection is made with tracks of the Public Service Railway, permitting through operation to the center of Newark. In all, nearly 50 miles of track is operated, about half of which is on private right-of-way.

For a number of years the company has been in financial difficulties. In July, 1923, a receivership was ordered by the court because of the refusal of a minority interest to agree to a refinancing plan. Prior to that, in 1918, the earnings being insufficient to meet the full interest charge on the bonds, the bondholders agreed for a period of five years to exchange the 5 per cent coupons on their bonds for new coupons at 2 per cent and income trust certificates to cover the difference. Under the trust agreement the 3 per cent coupons attached to the income trust certificate were automatically canceled each year when the earnings were insufficient to permit payment. During the following five years the 2 per cent coupons were regularly met and the income trust certificates were canceled.

Before the expiration of this proposal, in 1923, a refinancing plan was submitted to the bondholders. According to this plan they were to accept new bonds at 6 per cent for half of their holdings and non-cumulative preferred stock for the other half. Execution of this plan required the consent of all bondholders. Unfortunately, three individuals out of a total of 286, representing only 3.13 per cent of the bonds, refused to deposit their holdings for exchange and the refinancing plan could not be undertaken.

When the original paving agreements were made macadam paving was in general use throughout the territory in which the company operates, and it was stipulated that the paving work done by the railway should be of this type. In recent years, however, heavier pavements have come into use and an attempt has been made to have the railway install these more expensive kinds. To this the company has objected. As a solution of this difficult problem a bill was introduced in the New Jersey Legislature a year ago to relieve electric railways in part of their paving obligations. Although passed by the Senate and General Assembly, this bill was vetoed by the Governor and the question reverted to its original status. A similar bill has recently been presented to the Legislature, but no action has yet been taken.

Meanwhile O. G. Schultz, general manager of the railway, has proposed to remove the tracks and operate buses from Maplewood to Lake Hopatcong. Formal application for the necessary permits has not yet been made, but it is said that the company is hopeful of making the change by April 15. The municipalities would then do the repaving. Much favorable comment has been made concerning the pavement improvement feature of the plan.

Bus Service for Wisconsin Cities

Service on the lines of the Wisconsin Public Service Corporation in Two Rivers and on the interurban line between Two Rivers and Manitowoc will be abandoned if the Wisconsin Railroad Commission and the cities affected approve the discontinuance. Both the city service in Two Rivers and the interurban service are being run at a loss. In addition the city of Two Rivers has started an extensive paving program on streets occupied by the city lines and the interurban which would entail a burden heavier than the railway feels the traffic can bear.

C. R. Phenicie, vice-president of the company, who appeared before the City Councils of Two Rivers and Manitowoc recently, stated that ever since the corporation purchased the Manitowoc & Northern Traction Company the road has been operated at a loss. It is his idea to discontinue railway service and establish service by bus in Two Rivers and between the two cities. Several months ago railway service was abandoned in Manitowoc due to lack of patronage and the street cars there were replaced by a bus system.

Injunction Sustained at Louisville

A motion to dissolve a temporary injunction restraining the People's Transit Company, Louisville, Ky., from operating buses on Broadway was overruled by the Court of Appeals at Frankford on Feb. 12. The court, in overruling the motion, ordered the case heard on its merits.

The temporary injunction was granted the Louisville Railway by Judge William H. Field recently and carried to the Court of Appeals by the bus company.

The question to be decided, Judge Thomas said, was whether the operators were required to hold a franchise when they have already been granted licenses and permits by the city.

The court said that the question is "a far-reaching one since it would not only affect the various municipalities in the commonwealth, but it might also affect a county if it should attempt to grant such privileges over its public highways." In view of this it ordered the case tried on its merits.

The transit company in its appeal against the injunction said it was operating under a permit and license issued it by the city, while the railroad contended that "privileged" users of highways must have a franchise.

Auto Stages to Replace Interurban Trains in Washington

In the face of considerable opposition, the Department of Public Works at Olympia, Wash., recently granted the application of the Pacific Northwest Traction Company, which operates an interurban-stage line between Seattle and Bellingham, to substitute stages for certain interurban trains between Bellingham and Mount Vernon. The department was urged by the City Council, Chamber of Commerce and practically every civic club in Bellingham to grant the permit, declaring that Bellingham and Whatcom County are being discriminated against because they had no stage connections to Skagit County and Seattle and that the service would be a convenience and necessity.

The department granted the permit after the company testified that the gross operating revenues of the interurban had decreased steadily during the past few years; that it was necessary to increase the revenues between Mount Vernon and Bellingham and to curtail the operating expenses of the electric interurban line, which would require a reduction in the amount of service rendered; that increased patronage might be expected by reason of the coordinated service, and the fact that the bus is able to render more service to intermediate points along the highway than is now furnished by the electric railway.

The permit was opposed by a group of residents of Skagit County in Mount Vernon and Anacortes, who now threaten to carry their fight to the courts. Attorneys for the objectors declared that there was sufficient ground for appeal because of the basis upon which the department rested its decision, which they declared amounted to a subsidy for the railway by the department because the company had not been making sufficient money. The department declared that the objections of the Skagit County residents were not germane to the issues involved and were without the jurisdiction of the department. They include a charge of increased danger to the general public by reason of increased traffic, excessive speed and insufficiency of present tax methods to cover adequately the use of public highways by motor vehicles.

Tax on Interstate Buses Upheld

Much attention has been attracted by the decision of the United States District Court in Connecticut confirming the right of the state to levy a mileage tax on buses engaged in interstate commerce. It appears that a law was passed in Connecticut in 1925 imposing a tax of 1 cent a mile on interstate buses traveling on State highways. The Interstate Buses Corporation contested the act as unconstitutional under Section 8, Article I, which gives to the Congress the regulation of commerce among the several states. The law did not undertake to make interstate commerce subject to the jurisdiction of the utilities commission as the intrastate carrier is in Connecticut.

The opinion was written by Judge

Martin T. Manton of Brooklyn. Another Brooklyn Judge, Marcus B. Campbell, also sat in the court, and the third judge was Edwin S. Thomas of Norwalk, Conn. Judge Manton wrote that there could not now be a serious doubt that where the state had at its own expense furnished special facilities such as highways for the use of those engaged in commerce, interstate as well as domestic, it could exact compensation therefor. The theory of the excise tax, he said, was consistent with the rulings of the United States Supreme Court in cases concerning the use of special privileges and facilities. All that was required was that the tax should be reasonable in relation to the privilege. He wrote:

> As long as the discretion exercised by the State goes to the point of exerting its taxing powers in proportion to and adjusting the scheme, basis and amount of the tax to the possible extent and result of the use of the roads it is not an interference against interstate commerce. The state, however, may not enact a statute which requires an interstate carrier of passengers by motor bus to secure a certificate to establish the public convenience and necessity of operating the buses.
>
> Interstate business must pay its way and the expenses to others incident to the use of it.

Steam Bus Tested in New York

The Fifth Avenue Coach Company, New York, is testing a standard bus chassis driven by a new type of automotive boiler. Used with a steam engine of conventional type, the vehicle is said to combine flexibility and economy. The tests are under the supervision of L. H. Palmer, vice-president of the Fifth Avenue Company, and William McClellan of the engineering firm of McClellan & Junkersfeld, Inc. Ten tons of railway car axles are used on the test chassis to approximate the weight of a fully loaded bus. The vehicle is being driven about the city, particularly in the hilly districts of Washington Heights. Both Mr. Palmer and Mr. McClellan said the tests were not far enough advanced to determine definitely how it would operate under actual working conditions. The device is also being studied by one large city electric railway as a substitute for the expensive underground conduit system.

Buses Supplant Cars. — Implying abandonment of its interurban line between Raymond and South Bend, Wash., the Willapa Electric Company has been granted permission to provide service by bus between the two cities.

Applies for Permission to Run Buses.—The St. Louis Bus Company, affiliated with the United Railways, St. Louis, Mo., has applied to the St. Louis Board of Public Service for permission to operate buses on Olive Street when that street is widened from 60 ft. to 100 ft. between Twelfth Boulevard and Channing Avenue. The bus line would cooperate with the cars of the railway.

Buses Replace Cars.—The Worcester Consolidated Street Railway has discontinued railway service on its line between Clinton and Worcester, Mass., and substituted bus service. The change became effective on Feb. 7. C. V. Wood, president, has announced that it is probable other suburban lines operating out of Worcester will be converted to bus operation.

Financial and Corporate

Boston "L" Reorganization

Chairman of the Metropolitan Board Outlines Plan Now Up for Extension of Public Control.

Henry I. Harriman, chairman of the Division of Metropolitan Planning, which has reported to the Legislature of Massachusetts the proposition for reconstruction of the financial structure of the Boston Elevated Railway with a 50-year extension of the term of public control, has submitted to the committee on metropolitan affairs and the committee on street railways of the Legislature a statement of reasons and recommendations.

NEW RAPID TRANSIT COMMISSION PROPOSED

He says that a reorganization of the Elevated would be accomplished through the sale of its assets to a new rapid transit corporation for approximately $24,000,000 of common stock upon which 5 per cent was guaranteed and $26,000,000 of preferred stock upon which 4½ per cent was guaranteed, the new transit company, of course, assuming the obligations of the Elevated. Public control would be extended to the new transit company for a period sufficiently long to permit the preferred stock to be retired through the operations of a sinking fund by the end of the new period of public control. He said in part:

> In my explanation of the bill I referred specifically to a dividend saving of approximately $800,000 and referred in a general way to additional savings which would be made in tax payments, both under the plan suggested and under a modification of the same which would substitute 4½ per cent debentures for the 4½ per cent preferred stock, it, of course, being understood that the debentures, like the preferred stock, would be tax free in Massachusetts and would be paid off during the period of public control. Since the hearing the details of the tax savings have been worked out and are most interesting and important.
>
> The federal corporation tax is 13½ per cent on the net earnings (which in the case of the Elevated are its dividend payments), and a saving of $800,000 in dividend payments, therefore, means an additional saving in federal taxes of a little more than $100,000, bringing the actual saving under the plan suggested by us to $900,000.

DEBENTURES FOR PREFERRED STOCK

> If debentures are substituted for preferred stock, such substitution will change a dividend payment into an interest payment upon which there is no federal corporation tax. This interest payment will be a trifle under $1,200,000 a year, upon which the federal corporation tax saving will be about $160,000 annually. This saving should be added to the previous saving of $900,000, making the total saving about $1,060,000. The substitution of debentures for preferred stock will also effect a saving to the Elevated road of between $310,000 and $340,000 in its present Massachusetts franchise tax, so that the total immediate saving to the Elevated road resulting from the adoption of our plan of reorganization, modified, however, by substituting debentures for preferred stock, would be approximately $1,400,000, to which should be added a further saving of at least $200,000 in bond interest as old issues mature and new issues at lower rates are put out. This larger saving will make it feasible to set up a somewhat larger reserve for the retirement of the debentures and thus make possible a shorter term of public control, say to 30 years, if it is deemed desirable.

As either the preferred stock or the debentures will be callable for the retirement fund at par it is safe to assume that the retirement fund will be compound at 4½ per cent per annum. Accordingly, the $26,000,000 of debentures or preferred stock of the new company can be retired by an annual payment of $420,000 if the term be reduced to 30 years, or $235,000 per annum if it be reduced to 40 years.

An annual payment of $470,000 would retire both the preferred and common stocks at the end of a 40-year term. With any of the above payments the balance of the savings effected by the reorganization of the Elevated, and available for the payment of the indebtedness to the city and for new subway rentals, would be from $900,000 to $1,200,000. Because of the large savings effected Mr. Harriman recommends the substitution of the tax-free debentures for preferred stock in the reorganization plan.

This substitution of debentures for preferred stock might be objected to by the present bondholders on the theory that it unbalances the present ratio of stock to indebedness. As the debentures would be all guaranteed by the state and would all be retired within the period of public control, it would be perfectly safe to make these debentures junior to the outstanding bonds. It would also be necessary to make the debentures tax exempt in Massachusetts in order to make them a form of security acceptable to the present preferred stockholders.

Gary Employees Subscribe 100 Per Cent for Railway Stock

Employees of the Gary Railways, Gary, Ind., brought to a successful close on Feb. 14 the company's preferred stock sales campaign by subscribing 100 per cent to their allotment. Every one of the 310 employees of the railway subscribed for one or more shares, thus topping the mark established during a similar campaign in the fall of 1925, when 92.6 per cent of the employees purchased stock. The average holding is less than 1½ shares per employee.

The present issue of $200,000 par value of 7.2 per cent class A preferred stock was offered for sale under the customer-ownership plan beginning on Feb. 1 by the Utility Securities Company. Employees of the Gary Railways were the only persons participating in the public sale. Because of the limited number of shares available, orders from employees were given first consideration during the first five days of the sale. Subscriptions from patrons and other investors in communities served by the company were unusually heavy and the issue was oversubscribed within ten days.

The stock was offered at $98 a share, either on cash or deferred payment terms, at which price it yields about 7¼ per cent in annual dividends.

Redemption Plan Suggested

Seattle Bondholders Co-operate with Mayor in Alleviating Railway's Burdens—Herberg Suit Continues

A plan for the reduction of bond redemption payments on the Seattle Municipal Railway, Seattle, Wash., from $833,000 a year to $500,000 a year by extending the bond redemption period over an additional eight years has been placed before Mayor Bertha K. Landes by A. W. Leonard, president of the Puget Sound Power & Light Company, as the reply of the railway bondholders to the request of the Mayor for co-operation in lightening the railway's financial burdens. Mr. Leonard recently returned from Boston, where he conferred with the board of trustees of the Stone & Webster interests.

As a condition the bondholders insist that the present contract provisions giving priority to the bonds over all other obligations of the railway be fully protected by necessary legislation. The present holders of the purchase bonds ask the city to use good faith in endeavoring to obtain an extension of other outstanding bonds, amounting to approximately $1,650,000, which would mature prior to the Stone & Webster bonds if the latter were extended. If this could not be readily arranged, the purchase bondholders will waive priority as to these bonds, with the understanding that no other bonds junior to them would be issued.

The bondholders, in their plan, also suggest that if they are willing to assist the utility $1,000 a day in deferring annual bond payments, it is only fair to the thousands of railway patrons that the city accelerate the steps it has taken to increase earnings and still further reduce operating expenses.

In this connection it has been estimated that a reduction in power costs would save the railway $200,000 a year. The sale of power to the railway constitutes approximately 9 per cent of the light department's business. Mayor Landes and several of the Councilmen favor the plan as a simple way out of the difficulties of the line.

While the Mayor and the City Council are considering the plan suggested by the Puget Sound Power & Light Company to reduce bond redemption payments on the Seattle Municipal Street Railway, litigation involving the railway in the federal and Superior courts is moving forward. Judge Calvin S. Hall of the Superior Court has ruled that the company will be a defendant in the suit started by J. G. Von Herberg to compel the city to apply all receipts of the railway first to wages of its trainmen before any provision for bond redemption or other obligation be made. Immediately after this ruling, Mr. Von Herberg filed a motion in federal court asking that a complaint the company filed there be dismissed so far as he was made defendant.

The city filed a similar motion in the federal court, asking permission to be withdrawn as a defendant in a suit the company filed on Jan. 13. The power company, in its suit, named both the city and J. G. Von Herberg as defendants, asking that the city officials be restrained from withholding payment of the bond redemption and interest on the railway purchase contract until operating expenses of the line have been paid. The city's motion asks that the company's bill of complaint be dismissed in so far as it refers to the city as a defendant.

Action by Mr. Von Herberg and the city indicates that both want to see the railway litigation settled in the state courts rather than in the United States courts. In his suit in the state courts Mr. Von Herberg sought to have the city enjoined from putting money into the railway purchase bond fund until operating expenses had been paid. The city filed a bill of interpleader asking that the power company be made a defendant.

Good Showing in Milwaukee

Net Income in 1926 Increased by $1,186,867—Financial Structure Improved During Year.

Operating revenues of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., from transportation of passengers, freight and express were $10,937,411 for the year ended Dec. 31, 1926, an increase of 3.03 per cent compared with the year 1925. Operating revenues of the electric and heating departments were $15,282,343, an increase of 14.24 per cent over the previous year. Net income available for dividends was $4,025,699, compared with $2,838,831 in 1925. Net capital expenditures for additions to property and for betterments during the year were $7,409,146, after deducting replacements and property that was withdrawn from service. These facts were disclosed in the annual report to the stockholders.

Expenditures in the railway utility include principally the construction of the new rapid transit line, consisting of new double track on private right-of-way; extension of double track on Center Street in the city of Milwaukee to 60th Street; double tracking Downer Avenue; extension of track on First Avenue; extension of double track on Forest Home Avenue; rebuilding and double tracking Twenty-seventh Street, and double tracking Howell Avenue. Approximately 10½ miles of new track was constructed and added to the system during the year.

INCOME ACCOUNT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

		1926		1925
Operating revenues		$26,219,754		$23,992,653
Operating expenses:				
Ordinary operating expenses	$15,369,656		$14,415,619	
Depreciation	2,043,191		1,847,077	
Taxes	2,283,191		2,160,755	
Total operating expenses		$19,696,038		$18,423,451
Net operating revenues		$6,523,716		$5,569,202
Non-operating revenues		335,348		357,675
Gross income		$6,859,064		$5,926,877
Interest charges:				
Interest on funded debt	$2,266,754		$2,574,457	
Interest on depreciation reserve balance	521,979		471,814	
Interest on other reserves	44,630		41,772	
Total interest charges		$2,833,363		$3,088,043
Net income		$4,025,698		$2,838,831

STATISTICS OF RAILWAY OPERATION AT MILWAUKEE

	1926	1925
Miles of track owned	429.74	419.28
Miles of track leased	1.90	1.90
Miles of revenue track operated	399.00	391.49
Revenue passengers carried	154,908,620	150,591,216
Transfer passengers carried	54,648,880	53,635,554
Per cent transfer to revenue passenger	35.28	35.61
Receipts per revenue passenger	$0.0677	$0.0677
Number of passenger and express cars owned	912	861
Number of passenger motor buses owned	141	124
Kilowatt system demand	182,868	174,604

Forty new one-man safety passenger cars were purchased and placed in service during the month of December. Twenty new buses were purchased during the year. Four new snow sweepers and other necessary transportation utility equipment were purchased or constructed in the company's shops.

The financial structure of the company was considerably altered and improved during the year. The ratio of funded debt to the total capitalization was 64.6 per cent on Dec. 31, 1925, and was reduced to 54.6 per cent on Dec. 31, 1926. This decrease was accomplished by the sale of additional common and preferred stocks to provide funds for retiring $6,500,000 consolidated first mortgage bonds which matured and were paid on Feb. 1, 1926. The proceeds of the sale of common and preferred stock were also used in part to finance new construction during the year. The total par amount of securities retired was $19,576,500 and the total par amount of securities issued was $22,435,900.

S. B. Way, president, states that the transportation revenues of the company showed some improvement over previous years; the operation of an increased number of one-man safety cars during the non-rush hours and improvements to passenger equipment and rapid transit service should improve the future earnings of the transportation department.

The relations between the employees and the company continue to be satisfactory. The Employees' Mutual Benefit Association has now 6,110 members. The Employees' Mutual Savings Building & Loan Association continues to be a very important factor in establishing homes for employees and their families. Upward of $10,801,960 has been provided members for this purpose since the inception of the association in April, 1914.

Balance in Columbus $1,383,483

According to the report of the secretary and auditor of the Columbus Railway, Power & Light Company, Columbus, Ohio, the net balance of the company in 1926 was $1,383,483, against $672,600 for 1925. These facts were contained in the thirteenth annual report of the board of directors to the stockholders. Cyrus S. Eaton, president, states that the continued healthy growth of the company's business is reflected in the reports submitted.

During the year the company issued $1,857,100 of its first preferred 6 per cent stock. Of this amount $1,500,000 went to the public through its bankers and $357,100 to employees and customers. All stock was sold to the public, employees and customers at par in a customer-ownership campaign conducted by the employees of the company and supplemented by schedules of educational advertising in the Columbus daily newspapers.

INCOME ACCOUNT OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1926	1925
Railway operating revenues...	$3,409,499	$3,383,966
Power, light & heat operating revenues.................	5,887,572	5,316,787
Non-operating revenues......	33,187	10,236
Total gross revenues.......	$9,330,259	$8,710,989
Operating expenses..........	$5,086,958	$4,914,303
Taxes......................	953,239	912,275
Gross income.............	$3,290,061	$2,884,410
Deductions from gross income:		
Interest charges............	$882,702	$848,577
Other deductions............	64,126	66,974
Total deductions..........	$946,828	$915,552
Net income available for sinking fund, dividends and other financial requirements	$2,343,232	$1,968,858
Deductions from net income:		
Sinking found...............	$304,587	$319,439
Dividends:		
First preferred stock.......	329,207	164,794
Series B preferred stock....	325,954	361,616
Common stock............	....	450,408
Balance (credit to profit and loss account)...............	$1,383,483	$672,600

The company's policy of carrying out an extensive improvement program was continued. This is evidenced by the fact that total expenses chargeable to property account were $3,670,608. Of this amount $541,550 was used for track and roadway projects and $93,331 for cars and equipment. Railway improvements included new track, reconstructed track, track removal and special work. Rolling stock improvements included the overhauling of 166 cars and the painting of 115 cars. In addition six gas-electric buses were purchased during the latter part of the year and put in crosstown service. During the year 1.84 per cent of the gross receipts was used for claims cost.

PROFIT AND LOSS ACCOUNT OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1926	1925
Balance at beginning of year..	$3,603,925	$3,053,726
Credits		
Balance from each year's operations..................	1,383,483	672,600
Delayed income credits.......	11,668	15,893
Miscellaneous credits	6,913	....
Total credits............	$5,005,990	$3,742,220
Debits		
Dividends (paid in stock):		
Series A preferred stock.....	....	....
Series B preferred stock.....	....	....
Delayed income debits........	$63,227	....
Miscellaneous debits.........	28,732	$138,294
Total debits...............	$91,960	$138,294
Balance at end of year........	$4,914,030	$3,603,925

TRAFFIC STATISTICS OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1926	1925
Revenue passengers..........	64,841,596	64,591,271
Transfer passengers..........	16,573,110	16,420,874
Total passengers..........	81,414,706	81,012,145
Per cent of transfers to total passengers................	20.36	20.27
Revenue per revenue passengers in cents............	5.09	5.09
Revenue per passenger including transfers, in cents.......	4.05	4.06
Car mileage................	9,521,782	9,464,862

Springfield Property Passes to New Haven

Control of the Springfield Street Railway, Springfield, Mass., passed to the New York, New Haven & Hartford Railroad at a stockholders' meeting on Feb. 14. Directors were increased from seven to nine. They include E. J. Pearson, E. G. Buckland and A. P. Russell, New Haven; W. E. McGregor, Boston; George Dwight Pratt, Charles W. Bosworth, Clark V. Wood, George B. Bulkley and Henry A. Field, Springfield. The last three were re-elected. President Pearson of the New Haven was made chairman of the board, which immediately ratified the $1,500,000 improvement program. The executive staff of the Springfield Street Railway is unchanged. Clark V. Wood remains as active head. At a reorganization of the Springfield Railways E. J. Pearson was made president. New trustees with him are Messrs Buckland and Russell. C. M. Rogerson and Leverett Candee were re-elected vice-president and treasurer respectively of the Springfield Railways. William Crowe continues as secretary of both the Springfield Street Railway and the Springfield Railways and Bentley W. Warren as general counsel.

Approval Sought for Sale of Coral Gables Road

Approval of the sale of the Coral Gables Rapid Transit Company, Coral Gables, Fla., and all equipment is to be requested before the State Railroad Commission. Petition for the approval is to be filed within the next few days by John M. Murrell, Miami, attorney for the company. The monetary consideration involved was not given. It will be recalled that some time ago a proposal was advanced for the sale of the road to the city, but the information at present at hand about this latest move by the company does not make it plain whether or not the application now made is in furtherance of that plan.

Will Discontinue Line.—The Coast Cities Railway, Asbury Park, N. J., will discontinue its inside belt railway on March 1. The company claims that there is no further public demand for the belt line. The poles and tracks will be removed.

Capital Traction Would Buy Leased Line.—The Capital Traction Company, Washington, D. C., has opened negotiations for the purchase of the Washington & Maryland Railway, which runs from Fourteenth and Kennedy Streets, Washington, to Takoma Park, Md., according to reports received by the Public Utilities Commission. The company has been operating the line for the last ten years under a lease which expires on Feb. 19.

Increase in Capitalization Approved.—At the recent annual meeting of the Wisconsin Public Service Corporation, Green Bay, Wis., approval was voted of the plan recently projected to increase the authorized capital stock of the corporation from $8,500,000 to $20,000,000. Consequently the number of preferred shares will be increased from 55,000 to 125,000 valued at $12,500,000, and common from 30,000 shares to 750,000 shares valued at $7,500,000. The value of common stock at par is reduced from $100 to $10. It is not likely that any considerable amount of the stock will be issued in the near future.

$2,500,000 North Shore Notes Issued.—Halsey, Stuart & Company and the National City Company, New York, are offering for subscription at 99½ and interest, yielding more than 5.65 per cent, $2,500,000 of Chicago, North Shore & Milwaukee three-years 5½ per cent gold notes. The notes are dated Feb. 1, 1927, and interest is payable on Feb. 1 and Aug. 1. They are in the denomination of $1,000, $500 and $100.

Financing of New Rockford Companies Approved.—The Illinois Commerce Commission has authorized the Rockford Public Service Company, Rockford, Ill., to issue bonds to the extent of $1,000,000 against the company's holdings and stock to the amount of $500,000. The Rockford-Belvidere Railroad, recently acquired by the Ellis interests, has been authorized to operate the electric railway between Rockford and Belvidere and to issue $150,000 of stock. The formal approval of these plans completes all details of the financing of the successor companies at Rockford.

New British Columbia Director.—W. G. Murrin has been elected a director of the British Columbia Electric Railway, Vancouver, B. C., Canada. Mr. Murrin is vice-president of the railway.

Valuation of Discontinued Properties Computed.—Electric railway systems of the aggregate value of $591,225, located in Salem and Eugene, Ore., have discontinued operations owing to the failure of the public to support them adequately. The Public Service Commission has also authorized the Willamette Valley Southern Railway to discontinue the operation of 12 miles of railway in the Salem district. The books of the State Tax Commissioner show that the apportioned valuation placed on all these discontinued rail systems is $377,021. This source of state revenue will, necessarily, cease with the dismantling of the carrier lines in question. The Willamette Valley Southern is owned and operated by the Portland Electric Power Company, while the Salem and Eugene systems have been operated by the Southern Pacific Company.

Personal Items

G. R. Green Heads Master Mechanics

Superintendent of South Bend Road Heads Central Equipment Men's Organization

George R. Green, general superintendent of the Chicago, South Bend & Northern Indiana Railway, Michigan City, Ind., and its affiliated lines, the Southern Michigan Railway and the Railway Transit Company, a bus operating organization, has been elected president of the Central Electric Railway Master Mechanics' Association. Few men in mechanical circles in the Central Electric Railway Association's territory are better known than is Mr. Green; few men have had a career more spectacular than he and few have risen through the ranks to greater responsibility.

G. R. Green

Twenty-six years ago Mr. Green started to work at the age of fourteen as an armature winder's helper with the Detroit United Railway. He was not content merely to assist in winding armatures and then to wind them himself. He studied the whys and the wherefores. It did not militate one iota against his upward progress that he remained with the Detroit United property for eighteen years, except for three years between 1909 and 1912, during which time he was master mechanic of the Saginaw & Flint Railway.

At first promotions came slowly and advancement was by small steps, but initiative, persistence and hard work, combined with an interest in the problems of his company outside of his immediate duties, won for him deserved recognition. He finally rose to the position of general foreman of interurban equipment with the Detroit United Railway, but when he did attain that position, few other men in the country were better qualified by experience and training than was he.

In July, 1920, Mr. Green went to South Bend as superintendent of equipment. So thoroughly impressed was the management with the man's ability that when it appeared that railway service might be supplemented with buses, he was selected to study bus operation in other cities. When the new service was decided upon, he was placed in charge of starting the buses and operating them. Next followed his appointment to be general superintendent of the rail lines and buses. He was appointed to this post in March, 1925.

Retirements and Changes in Rockford

A. P. Lewis of Wichita, Kan., has been appointed general superintendent of the Rockford Public Service Company, recently acquired by T. M. Ellis. Mr. Lewis succeeds Archie Andrew, who retires from the post as superintendent of transportation of the old Rockford City Traction Company after 25 years service. Five veteran department heads in executive positions are retired under the new ownership. Besides Mr. Andrew they are Edwin Main, maintenance of way engineer; Shell R. Smith, claim agent; H. D. Hollenbeck, purchasing agent, and Otis R. Hill, superintendent of equipment.

J. D. Whittemore Resigns from Wheeling Company

Joseph Damon Whittemore has resigned as vice-president and general manager of the Monongahela West Penn Public Service Company, Wheeling, W. Va. He became connected with the Wheeling property in July, 1924. Three years prior to that he was associated with W. S. Barstow & Company, New York, as supervising executive of several utility properties in the East. During his residence in Wheeling he had charge of the operations of properties in Wheeling and Morgantown.

Mr. Whittemore is a New Englander by birth. In the time that he was at Wheeling the Monongahela West Penn Public Service Company expanded widely and practically all of the independent properties in northern West Virginia were purchased and amalgamated with the Monongahela West Penn Public Service Company.

Howard R. Whitney has been named operating vice-president of the Worcester Consolidated Street Railway, Worcester, Mass., as the personal representative of President Clark V. Wood to supervise and carry through the program of rehabilitation sponsored by the New York, New Haven & Hartford Railroad. Mr. Whitney is also vice-president of the Springfield Street Railway, but his office there will not be filled for the present. Mr. Whitney is being assisted in his work in Worcester by Henry C. Page, general manager of the Consolidated.

E. F. Kelley Assigned Additional Duties at Louisville

Edward F. Kelley, secretary to President James P. Barnes, Louisville Railway, Louisville, Ky., was recently appointed purchasing agent in addition to his secretarial duties. He succeeds in that capacity C. Edward Earley, to whom less arduous duties have been assigned.

Mr. Kelley is well known in the railway field, not only because of his work assisting Mr. Barnes but also as editor of the *News Service Bulletin*, a bimonthly publication of the Committee on Public Utility Information of the Kentucky Association of Public Utilities. It was his keen knowledge of electric railway affairs of the state and country and his realization of the difficulties confronting the utility companies and their relation to the public which brought him the editorship of the bulletin. In that work he has been constantly improving the understanding between the public and the company. He is also editor of *Trolley Topics*, the house organ distributed by the Louisville Railway among its employees.

E. F. Kelley

Mr. Kelley became associated with Mr. Barnes in 1905. Prior to that he was with the New York Central and thereafter with Mr. Barnes at Syracuse, Utica, Rome, Little Falls, Oneida, Rochester and Schenectady, N. Y. In 1920 he became secretary to Mr. Barnes at Louisville.

In his new work he will have complete charge of the purchase of supplies and materials for all departments of the Louisville Railway, the Louisville & Interurban Railroad and the Kentucky Carriers, Inc., as well as being superintendent of the office building in charge of maintenance of that building.

Besides the offices already mentioned Mr. Kelley is secretary of the Kentucky Association of Public Utilities and secretary and director of the Kentucky Committee on Public Utility Information. He is also secretary of the Louisville Kiwanis Club, which position he has held for the past seven years, and for a while was district secretary of the Kentucky-Tennessee District Kiwanis Clubs.

W. W. Foster Heads New York Interurban

Former Secretary, Treasurer and Manager of Rochester-Buffalo Road Is Made President—Other Changes

William W. Foster, for many years secretary, treasurer and general manager of the Rochester, Lockport & Buffalo Railroad Corporation, Rochester, N. Y., was elected president of the company to succeed E. R. Wood, Toronto, who retired, at a meeting of directors and stockholders in Rochester on Feb. 8.

Joseph D. Nailor was advanced from superintendent of transportation and equipment to general manager and treasurer. Mr. Nailor began his railway career eighteen years ago as a motorman.

Jerry D. Foster becomes secretary of the corporation, but retains his present position as auditor.

Allen S. Muirheid, Toronto, was reelected vice-president. Herman L. Lang, trainmaster, was promoted to superintendent of transportation and Donald Dewitt was advanced from special agent to general traffic agent. L. D. Harner, general shop foreman, becomes master mechanic.

W. W. Foster

It was stated at the headquarters of the company in Rochester that Mr. Wood retired to devote his attention to other interests nearer his home in Canada, and that there would be no change in policy or operation as a result of the changes in personnel.

Mr. Foster, the new president, is very well known in New York State, not only for his association with electric railway activities but also for his banking and business affiliations. At the age of sixteen he entered the employ of the First National Bank of Syracuse as a clerk. Two years later he entered the service of Holden & Sons, wholesale coal dealers, as an accountant and cashier. In 1905 he became identified with electric railway interests when he went with the Beebe Syndicate as general auditor and assistant treasurer. This syndicate operated five interurban electric railways, including the Buffalo, Lockport & Rochester Railway, which was taken over in 1911.

In the railway field Mr. Foster seemed to have found his chief interest. In June, 1915, the Buffalo, Lockport & Rochester Railway was segregated from the Beebe Syndicate and at that time he became auditor, secretary and treasurer, moving his offices to Rochester, N. Y. A little more than two years later he was appointed general manager of the company, but still retained the position of secretary-treasurer. In April, 1919, the company was reorganized and the name changed to the Rochester, Lockport & Buffalo Railroad Corporation. Then it was that he was elected a director and appointed to the positions of secretary-treasurer and general manager. In June, 1926, he was elected president of the New York Electric Railway Association. He was born in Syracuse on Jan. 1, 1873.

The road he heads operates 67.9 miles of interurban railway across western New York connecting the important cities of Buffalo and Rochester, through transfer at Lockport, its western terminus. The line in general follows the route of the Barge Canal, serving the communities in the prosperous Lake Ontario fruit belt.

President Ready in New Office

The directors of the Key System Transit Company, Oakland, Cal., at their monthly meeting, held on Dec. 16, formally elected Lester S. Ready to the presidency. He assumed his new duties on Jan. 3, taking complete charge of the entire system. The new president has been chief engineer of the California Railroad Commission. His career has been reviewed before in the ELECTRIC RAILWAY JOURNAL.

Mr. Ready has accepted the presidency of the Key System Transit Company believing that with his thirteen years experience in the observation of public utility operation and in the active work of the regulation of these utilities he can be of material assistance both to the company and the people of the East Bay.

As he sees it, the development of a great metropolitan area such as the East Bay district is dependent upon utility transportation. A large part of the public must rely upon the facilities of the Key System for its means of travel. At the present time the Key System Transit Company is responsible for the safe, convenient and rapid transportation of at least 50 per cent of the traveling public of the East Bay district. Experience of other cities indicates that as the population grows a greater and greater percentage of the public must depend upon street car and bus transportation. Mr. Ready realizes that it is important that the problems of traffic and public transportation be solved correctly.

He has said that the aim and duty of the Key System Transit Company are to render to the rapidly growing East Bay district a good utility transportation service. As an evidence of the company's disposition to do this Mr. Ready recalled that during the last two years and ten months approximately $6,500,000 has been spent to enlarge and improve the facilities of the company that a better service may be rendered. Further improvements will be made as rapidly as it is financially possible.

Convinced that the best service can only be rendered to the community through the whole-hearted co-operation between the company and the public, Mr. Ready has stated for the company that it is ready and willing to co-operate with the public as far as it can and that he will appreciate suggestions from the public. Thus he enters upon his new duties convinced that, in view of the importance of adequate transportation to the development of a community, the problem can be worked out so as to be profitable both to the company and to the public it serves.

C. G. Adsit a West Towns Official

Charles G. Adsit, nationally known as an engineer, has been elected a director of the Chicago & West Towns Railway, Oak Park, Ill. He has long been interested in the affairs of the Georgia Railway & Power Company and is vice-president and executive engineer of that company. Previous to his affiliation with the company at Atlanta he had extensive engineering experience in the western part of the United States, in South America and in Mexico. His association with the Georgia company actually dates back to 1911, when he became resident engineer on the Tallulah Falls hydroelectric development. Later he was made consulting engineer and chief engineer, and had charge of the development of Mathis dam and reservoir and Burton dam and reservoir and the Tugalo development. On April 1, 1922, he was made executive engineer with authority and jurisdiction over engineering work of all departments. In May of the same year he was made a vice-president of the company.

C. G. Adsit

Ezra Brainerd, Jr., Nominated for I.C.C.

Ezra Brainerd, Jr., Muskogee, Okla., was nominated to be a member of the Interstate Commerce Commission on Feb. 16 by President Coolidge, succeeding Frederick I. Cox of New Jersey, whose reappointment was rejected. This action eliminates Pennsylvania from the contest for the post for which Cyrus E. Woods, backed by Senator Reed of Pennsylvania, was first nominated by President Coolidge. Mr. Brainerd is a lawyer and vice-president of the oldest bank in Oklahoma. He was graduated from Colgate University and the University of Michigan Law School. He is a Republican and was recommended by Senator Harreld.

New Commercial Department Functioning at Youngstown

With the appointment of D. J. Graham as assistant manager of railways of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, at the opening of the year the ride-selling activities of the Penn-Ohio System have been concentrated in a well-organized commercial department.

In this department will be centered all matters that have to do with checking and developing the service of the various transportation lines and making them have a stronger and stronger appeal to the traveler and to the people of the communities served. Here also will center the development of freight traffic, a branch that has been of steadily increasing value.

Associated with Mr. Graham as his aids in carrying on this work will be:

Charles J. Collins, general freight agent, in charge of the freight service of the system.

Donald S. James, general passenger agent, directly engaged in the duty of developing passenger business.

H. H. Best, supervisor of schedules, in charge of analysis and preparation of schedules of service.

Perry Weller, statistician, who will develop and keep records and checks of service.

The purpose of the commercial department will be to sell more rides through the application of good salesmanship in every department of the service—to build up and develop both freight and passenger business.

Victor Emanuel to Return to Utility Field

Victor Emanuel, former chairman of the National Electric Power Company, is planning to return to the utility field. He resigned as chairman last year, but continued as a director after the company was acquired by Samuel Insull. The National Electric Power Company was founded by Albert Emanuel, father of Victor Emanuel. It was learned recently that Mr. Emanuel had formed in New York State last October the United States Electric Power Corporation, which through a subsidiary, has acquired small utility properties in the State of Washington. The United States Electric Power Corporation has applied for permission to increase its capital from 100,000 shares of no par or nominal value to 800,000 shares.

C. E. Earley, who has been purchasing agent of the Louisville Railway, Louisville, Ky., for the last eight years, has at his own request been transferred to duties less arduous. Mr. Earley has been connected with the company for 35 years. He entered the service when he was only 15 years of age as a trolley boy and worked his way up to the position of purchasing agent.

Obituary

O. C. Macy

O. C. Macy, vice-president of the Chicago, Harvard & Geneva Lake Railway, Walworth, Wis., died recently. Early in his career Mr. Macy had been superintendent of the electric railway lines in Cairo, Ill. In 1908 he became affiliated with the East St. Louis & Suburban Railway in charge of the Alton division. In this work he continued until 1915, when he took charge of the East St. Louis, Columbia & Waterloo Railway. After severing his connection with the latter property he was employed in the automobile sales business for a while and then went to Chicago, where he served as vice-president of the Chicago, Harvard & Geneva Lake Railway. This property connects Harvard and Big Foot, Ill., and Walworth and Fontana, Wis. Late last year Mr. Macy came East on a business trip and became suddenly ill. He was taken to the Mountainside Hospital at Montclair, N. J., where he died of pneumonia.

Albert Bath

Albert Bath, one of the executives of the Detroit Department of Street Railways, died on Jan. 30. At the time of his death and for about two years previous he was division superintendent of the Trumbull-Northwestern belt line of the Municipal system.

Late in 1907 he became night foreman at the Trumbull Avenue carhouse of the Detroit United Railway. He was transferred soon after to the Jefferson carhouse and in May, 1909, was made day foreman of the Fourteenth Street carhouse. His promotion to assistant division superintendent of the Fourteenth and Crosstown lines followed in October, 1909. He was made division superintendent of the Harper-Sherman-Baker lines of the Detroit United Railway in July, 1915, and was transferred to the Trumbull Northwestern belt lines in January, 1925. Mr. Bath was born in Rochester, N. Y., in 1880.

Russell Robb

Russell Robb, senior vice-president and treasurer of Stone & Webster, Inc., died at Phillips House, Boston, on Feb. 15. Mr. Robb was one of the pioneer associates and earlier members of the firm of Stone & Webster and was known throughout the public utility industry as a sagacious leader of its inner councils. Modest and kindly in disposition, he was much beloved by those who came in contact with him.

The development of Stone & Webster's organization from its small beginnings nearly 40 years ago to its present magnitude and influence is, of course, due to no single individual, but as the first partner in this enterprise to enter the firm after Messrs. Stone and Webster, Mr. Robb's share in its upbuilding and his sound influence upon the utility industry cannot be reduced to measurement.

He was born at Dubuque, Iowa, Dec. 6, 1864; was graduated from the Massachusetts Institute of Technology in 1888, being a classmate of Charles A. Stone and Edwin S. Webster, and after two years of engineering service with the Thomson Electric Welding Company at Lynn, Mass., joined the engineering organization of Stone & Webster at Boston in 1891. In 1905 he was made a member of the firm and in 1920 was made senior vice-president and treasurer of the company which succeeded the former organization.

Mr. Robb was an officer and director in a long list of public utilities in the traction, light and power field. In 1896 he was the author of a book on "Electric Wiring," and in 1909-11 he lectured at Harvard University on public utility topics, his "Lectures on Organization" being privately printed in 1909. He was prominent in civic life in his home town of Concord, Mass., and was a member of the American Institute of Electrical Engineers and many other organizations and clubs.

John W. Smith, director of the Indianapolis Street Railway, Indianapolis, Ind., and also of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., died recently. He was 67 years old.

Jeston N. Chamberlin, secretary of the Beckwith-Chandler Company, Newark, N. J., died on Feb. 6 at Jefferson Hospital, Philadelphia, Pa., following an operation. Mr. Chamberlin had been connected with the Beckwith-Chandler Company fourteen years as secretary in charge of railroad sales. He was 46 years old.

Louis Lewis, formerly of Richmond, who assisted in building the first electric railway in Richmond, died recently in Philadelphia. At the time of his death he was president of the Central Automatic Sprinkler Company, Philadelphia. Following his work in the railway field, Mr. Lewis designed and built the electric power equipment in many large mills and institutions in the country. He was 78 years old.

Robert W. Seebaum, assistant claim agent for the Cincinnati Street Railway, Cincinnati, Ohio, died at his home in that city on Jan. 11 following a long illness. Mr. Seebaum, had been connected with the claim department of the railway for 23 years. He was graduated from Columbia University and attended the Cincinnati Law School.

Lynn Shaddeau, purchasing agent of the Saginaw Transit Company, Saginaw, Mich., died suddenly on Jan. 18. Mr. Shaddeau had been connected with the Saginaw Transit Company and the Saginaw-Bay City Railway, its predecessor, for twenty years. His death marks the first break in the new organization since its inception three years ago. Mr. Shaddeau was born in Saginaw in 1886.

John S. Moore, general passenger and freight agent of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, both of South Bend, Ind., died recently. Mr. Moore had been connected with these companies since 1918. Previous to that time he had been in the freight department of the South Shore Railway and had been employed by the Wabash Railroad in the capacity of station agent at different points on its line.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

$724,372 Net Profit for Brill

Car Builder Reports Approximately $7,250,000 of Work on Hand Jan. 1, 1927

For the year 1926 the combined output of the J. G. Brill Company's four plants amounted in sales value to $10,416,381.

The combined output for each of the past seven years follows:

1920	$17,537,293
1921	7,647,898
1922	10,177,582
1923	18,167,486
1924	8,721,726
1925	9,101,909
1926	10,416,381

After deducting from earnings all cost of operations, in which are included maintenance and repairs and depreciation for the year amounting to $507,602 and after setting aside out of earnings reserve for federal income taxes, not yet due, of $109,178 the result of the operations of all the plants of the company shows a net profit for the year of $724,372.

The amount of work on hand on Jan. 1, 1927, was approximately $7,250,000, compared with $3,850,000 at the same time last year.

CONSOLIDATED PROFIT AND LOSS AND EARNED SURPLUS ACCOUNTS OF THE J. G. BRILL COMPANY AND SUBSIDIARIES FOR YEAR 1926.

Total net sales billed		$10,416,381
Cost of sales, including operating, selling, administration and general expenses and depreciation for the year, less miscellaneous income		9,582,831
Operating profit		$833,550
Less estimated federal income and state taxes for 1926		109,178
Net profit to earned surplus		$724,372
Earned surplus at Dec. 31, 1925		$4,916,668
Surplus adjustments		....
		$4,916,668
Add profit as above		724,372
		$5,641,000
Less dividends paid—		
Preferred	$320,600	
Common	200,425	521,025
Earned surplus at Dec. 31, 1926		$5,120,015

Milwaukee Company Has $5,000,000 Railway Budget

Nearly $5,000,000 will be spent for railway and bus improvements by the Milwaukee Electric Railway & Light Company and five other North American subsidiary companies, according to a recent statement issued by S. B. Way, president of the Milwaukee utility. The entire addition and betterment program will cost approximately $11,449,000. Of this amount $4,492,184 for improvements and additions to the electric railway and bus transportation service in the Milwaukee area. In the territory served by the Wisconsin Gas & Electric Company, operating in Racine, Kenosha, Waukesha, Watertown, Burlington and a score of smaller communities in southeastern Wisconsin, $105,334 will be expended for railway and bus improvements. While in the Appleton district, the Wisconsin Traction, Light, Heat & Power Company is slated to spend $152,314 in improving its railway and bus service.

Montreal Tramways Has $1,000,000 Rolling Stock Program

Fifty new street cars and ten new auto buses to cost approximately $1,000,000 shortly will be added to the equipment of the Montreal Tramways. Although plans for the cars have not been completed, it is understood the order will include 25 double-truck cars of a different design from those now in use on the St. Denis route. Each car will cost $17,000 and delivery is expected in the early fall. Approximately $130,000 is being spent by the company for new auto buses, each bus to cost approximately $15,000. They are being manufactured by the Yellow Truck & Coach Manufacturing Company. Delivery on this order of ten buses has already commenced, five of them having reached Montreal from Chicago last week. The buses have a seating capacity of 34 passengers each as compared with the 29-passenger type now in service. Contract for the cars will be awarded shortly.

De Luxe Car Service for Washington & Baltimore Soon

Ten articulated cars recently ordered by the Washington, Baltimore & Annapolis Railroad are to be placed in service very shortly, according to a recent announcement made public by President J. J. Doyle. It is understood that five of the cars will be in operation by the end of February.

The new rolling stock, for which contracts were awarded the J. G. Brill Company and the Westinghouse Electric & Manufacturing Company, represent an outlay of $500,000. They will be the first of their type chosen for operation by any high-speed interurban line in America. As detailed in the JOURNAL for Jan. 22, page 165, the cars are connected or articulated by a center truck.

The decision to provide a new and exceptionally luxurious type of car for the patrons of the Washington, Baltimore & Annapolis line was made by officials of the company when it was realized that the advent of the beautifully finished and smooth riding buses attracted thousands of electric car riders to the auto coaches. It was then decided to furnish equal riding luxury on the electric cars, which, with traffic over a carefully guarded right-of-way and with rigidly maintained schedules capable of meeting any transportation demands, day or night, would afford the riding public the greatest degree of safety.

Rockford & Interurban to Order Seven New Interurban Cars

From official circles it is learned that the Rockford & Interurban Railway, Rockford, Ill., shortly will place contracts for seven new one-man interurban cars and that it will immediately convert two of its present interurban cars to the one-man type. Plans also call for rebuilding a third car along these lines in the near future. Delivery of the new rolling stock is set for May 1. Thus the information was incorrect which appeared in an article in the JOURNAL for Feb. 5, page 270, in which it was stated that ten cars had already been ordered by the company at a cost of $100,000. Recent advices raise this figure to $160,000 for the seven new cars.

Omaha Company Allots $80,000 for Trackwork

According to the annual forecast of the Omaha & Council Bluffs Street Railway several important improvements are contemplated for the coming year. Among them is the widening of the Q Street viaduct in South Omaha, which has just been ordered by the City Council. The cost of this project is estimated at $200,000, of which the company's proportion, including trackwork, will be about $36,000. Another item is the widening of Twentieth Street between Dodge and Harney Streets. This work is expected to cost in the neighborhood of $25,000 and will involve the realignment of tracks. Another improvement includes the expenditure of $30,700 for the repaving of Sixteenth Street between Farnam and Leavenworth Streets. Paving of Vinton Street between 24th and 25th in Omaha and the resurfacing of Broadway in Council Bluffs between First Street and Franklin Street are other contemplated improvements, for which the company estimates it will spend $15,000.

Giant Electric Engine Goes West for Great Northern

Great Northern Railway, St. Paul, Minn., will soon put into service in the Pacific Northwest a giant two-unit motor-generator electric locomotive recently completed jointly by the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Company of East Pittsburgh. The locomotive is now being piloted through the Northwest states by T. E. McGettigan and E. R. Randolph, making stops at the principal cities, perhaps going as far as Vancouver, B. C., for exhibition purposes. The locomotive weighs 715,000 lb. and is 94 ft. 4 in. long over all between faces of buffers.

The motive-power will operate on the Great Northern line between Skykomish and the summit of the Cascades on the Everett-Wenatchee division, and later, when the new Cascade tunnel is ready, will haul trains through the 7¾-mile bore.

Orders for Electrical Goods Increase

New orders booked during the fourth quarter of 1926, as reported to the Department of Commerce by 72 manufacturers of electrical goods, were $246,711,426 as compared with $229,423,540 for the third quarter of 1926 and $234,871,751 for the fourth quarter of 1925. The total bookings for 1926 for these concerns were $963,852,642, as compared with $900,985,980 in 1925.

Rolling Stock

Springfield Street Railway, Springfield, Mass., and Worcester Consolidated Street Railway, Worcester, Mass., have completed specifications and will shortly call for bids on approximately 100 new cars of the one-man, two-man type.

Fitchburg & Leominster Street Railway, Fitchburg, Mass., has recently ordered four double-truck safety cars from J. G. Brill Company. The specifications include Brill 117-E trucks.

J. G. Brill Company, Philadelphia, Pa., has received an order for five 50-ft. 6-in. passenger and smoking car motor bodies from the Philadelphia & Western Railway, Philadelphia, Pa. The bodies will be mounted on Brill 27 M.C.B. trucks.

Portland Electric Power Company, Portland, Ore., has received a new six-cylinder Mack bus with street car body for use on the bus line to Marquam Hill.

Phoenix Municipal Railway, Phoenix, Ariz., will purchase a number of new cars if the voters on March 12 approve a program calling for the expenditure of $175,000 in rehabilitating the property.

Fageol Company, Kent, Ohio, reports the delivery of eleven coaches, type DD to the Department of Street Railways, City of Detroit, Mich. All the coaches are equipped with Westinghouse air brakes.

Track and Line

Tidewater Power Company, Wilmington, N. C., owned by the Fitkin interests, will reconstruct its line between Wilmington and Wrightsville Beach, North Carolina, at a cost of approximately $50,000. The project will include the relaying of 32,000 ft. of new and heavier rail. Charles Brooks, general manager railways for the company, has charge of the work, which is scheduled to begin about March 1. Wrightsville Beach is North Carolina's leading ocean resort and the new line will double the service capacity.

Trenton & Mercer County Traction Corporation, Trenton, N. J., will commence shortly the construction of a loop in the Wilbur section of the city, the work having been approved by the Board of Public Utility Commissioners.

Wisconsin Public Service Corporation, Green Bay, Wis., has completed its budget for 1927, which calls for the expenditure of $1,680,000 for improvements and additions to its properties in Wisconsin. To improve its electric railway and bus properties, approximately $625,000 will be spent during 1927.

Tri-City Railway, Davenport, Ia., is installing a new trolley wire on Harrison Street. The wire is being strung from Second Street north to Eighth Street for use of the Vander Veer Park and Gaines Street line. The improvement will cost about $1,000.

Seattle Municipal Street Railway, Seattle, Wash., through its superintendent, D. W. Henderson, is urging the immediate reconstruction of Westlake Avenue car tracks, and has asked the Council utilities committee to make $55,000 available for the work at once. Rails and other materials worth more than $30,000 were purchased three years ago, but the railway fund has never been able to finance the installation. The project extends from Roy to Fulton Street. Mr. Henderson suggests that the $55,000 be appropriated as a loan from the depreciation reserve.

Shops and Buildings

Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio, will erect eight new automatic stations between Dayton and Cincinnati at a total cost of $200,000. This is part of a $1,500,000 rehabilitation program which has just been launched.

Hartford & Springfield Coach Company is removing all steam and electrical equipment from the old power plant at Warehouse Point, Conn., and is installing automatic machinery for rebuilding and repairing buses for its own and other lines. Among the concerns to be served are the Interstate Buses Corporation, Long Island Coach Company and Colonial Coach Company of Newport, R. I. Carl Derr is superintendent of the maintenance operations.

Trade Notes

Rome Wire Company, Rome, N. Y., announces the opening of a new warehouse to serve the Detroit territory. Herman C. Jobs will be in charge of the new service station.

Universal Car Parts Corporation has just been organized in Baltimore, Md., for the purpose of manufacturing and installing car parts and accessories and having as its special product the "Universal joint coupler," of which Joseph M. Saurez is the inventor. The corporation will concentrate its energies and resources on introducing Mr. Saurez's invention, a two-ball coupler designed to take the shortest curves and most abrupt change of grades and lateral inclinations. Offices of the corporation will be at 6 East Mulberry Street, Baltimore, Md.

Tide Water Oil Sales Corporation has secured a yearly contract for gasoline from the Fifth Avenue Coach Company, the Yellow Taxi Cab Corporation, and the Hertz Driv-Ur-Self Sales Corporation. The probable amount of gasoline which will be used by these corporations for the year is between 16,000,000 and 20,000,000 gal.

ELECTRIC RAILWAY MATERIAL PRICES—Feb. 15, 1927

Metals—New York

Copper, electrolytic, cents per lb	12.435
Lead, cents per lb	7.425
Nickel, cents per lb	35.00
Zinc, cents per lb	7.00
Tin, Straits, cents per lb	68.625
Aluminum, 98 or 99 per cent, cents per lb	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.825
Somerset mine run, Boston	2.125
Pittsburgh mine run, Pittsburgh	1.85
Franklin, Ill., screenings, Chicago	2.05
Central, Ill., screenings, Chicago	1.875
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb	2.90
Tie plates (flat type), cents per lb	2.35
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	4.20
Steel bars, cents per lb	1.90
Ties, white oak, Chicago, 6 in.x8 in.x8 ft	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.40
Sheet iron (24 gage), cents per lb	2.80
Sheet iron, galvanized (24 gage), cents per lb.	3.70
Galvanized barbed wire, cents per lb	3.25
Galvanized wire, ordinary, cents per lb	2.40

Waste—New York

Waste, wool, cents per lb	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.80
White lead in oil (100 lb. keg), cents per lb	14.50
Turpentine (bbl. lots), per gal	$0.76
Putty, 100 lb. tins, cents per lb	5.25–5.50

Wire—New York

Copper wire, cents per lb	14.50
Rubber-covered wire, No. 14, per 1,000 ft	$5.50
Weatherproof wire base, cents per lb	16.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$142.40
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y	1.75
Sand, cu.yd., f.o.b. N. Y	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	10.50
Light copper, cents per lb	9.25
Heavy brass, cents per lb	6.75
Zinc, old scrap, cents per lb	4.00
Lead, cents per lb. (heavy)	6.00
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	15.25
Rails (short), Chicago, gross ton	16.75
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.25

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 — New York, Saturday, February 26, 1927 — *Number* 9

The Legislative Reformer Is Hard at Work

LEGISLATURES are in session in 41 states. Thousands of bills of all descriptions are pouring into the hoppers. Many of them will never see the light of day. It is just as well. Of all the sins to which humanity—particularly humanity in the United States—is heir, the sin of legislation is one of the worst. It is an ever-recurring but strange sight this, but there seems nothing to do but grin and bear it. That, however, is not so easy to do in some cases. There is no need to go into the details, but the efforts being made in some states to legislate against one-man cars, to return to home rule and to attempt to cure this or that supposed ill by legislation would be funny if they were not quite so serious in their possible consequences.

This does not mean that one should not give serious heed to the recommendations in the Governors' messages abstracted elsewhere in this issue. Some of the things sought to be accomplished are laudable in their purpose. It is to be hoped that the bills intended to put these recommendations into effect may be enacted into law. To assume a negative attitude on the whole matter of legislation will not do just because many of the bills are ill-conceived. It is advisable to work assiduously against bills that are likely to impose hardship on the industry, but while doing so it is also well to try to preserve a philosophical attitude toward the measures of the zealot imbued with the insane idea of reformation at one fell swoop. Nothing helps the reformer more than to underestimate him or to hold him too cheaply. The zealot, enamored of his own estimation of his own importance and charmed by the sound of his own voice, is not dangerous so long as he is content, Narcissus-like, to be satisfied with his own reflection and his own echo, but no one knows how long he will remain thus content. It is when he attempts to translate his zeal into action that he becomes a menace to society. Evidence of the bitter consequences of such endeavor beset the world at every turn. If legislation could make us good, we would be good indeed.

Many Failures in Service Are Due to Carelessness

NOT long ago a certain large department store made a careful investigation to determine the reason for every road breakdown of its motor truck delivery equipment. It was found that about 40 per cent of the breakdowns were due to carelessness, either in operation or maintenance, and that 60 per cent could be properly attributed to causes such as failure of material or general wear and tear. Analyzing further the matter of carelessness, it was found that only 10 per cent of the total breakdowns resulted from faulty maintenance, while 30 per cent were caused by improper operation of the vehicle. These conclusions are particularly significant because the investigation was conducted by a neutral member of the store's executive staff.

To some extent a similar condition exists in connection with electric railway operation of cars and buses. Because of careful inspection methods on most railways incipient failures of material usually are detected before breakdown occurs on the road. For that reason the proportion of breakdowns due to abuse of equipment probably exceeds the 30 per cent found in the cases of the delivery trucks, and the proportion due to material failure is smaller. While the construction of the average railway car is more rugged than that of an automotive delivery vehicle and it will stand more abuse by its operators, the number of road failures resulting from such causes as carelessness and improper operation undoubtedly is large. Careful analysis of this situation would be well worth while on any railway property. Not only would repair bills be reduced but fewer interruptions to service would occur.

Ready-to-Wear vs. Custom Built

MUCH theory has been aired concerning the ultimate rôle which the bus will play in the drama of co-ordinated transportation. There have been some to claim that it might properly be expected to replace the street car, or at least to share honors with it, as an instrument of mass transportation. Enthusiasts all for the bus, the exponents of this theory have shown a singular lack of foresightedness in sensing the real field in which the vehicle might best develop its manifold possibilities. In their eagerness to see its widespread adoption in transportation work they have, in various local instances, come perilously close to convincing the people that the bus is nothing more nor less than a street car on rubber tires.

Much more constructive is the stand taken by an ever-increasing number of transportation executives, that the bus will best serve them as an entering wedge among the class of people who have a decided aversion to rubbing shoulders with the hoi polloi in a crowded car—who prefer the comfort and individuality of their own automobiles, be the attendant evils of traffic congestion and lack of parking facilities what they may. This is no small element in any community of size. It is constituted of people who know what they want and who have the money to pay to secure it. The prosperous business man as a rule does not drive to his office in his own car because he enjoys the task of threading the choked downtown streets and paying an exorbitant parking charge for space in some centrally located garage. But he will do this if he must in order to obtain the privileges which he has been led to believe epitomize social prestige and which certainly guarantee a degree of comfort not obtainable in a mass transportation vehicle.

There is no fundamental reason why buses should not be operated in de luxe suburban service, providing for the better residential districts of a given area a transportation medium quite comparable to the private automobile. Direct express service to the central business and shopping districts; even reserved club car service for the men in a certain residential section who might wish to subscribe to such an institution—these are but suggestions of the possibilities which might be developed by a railway company whose executives have a sense for latent values. Of course the fares charged for these services must of necessity be on a plane to justify the luxurious equipment and attention to individual needs wihch are provided.

Two Pennsylvania systems, the Philadelphia Rapid Transit Company and the Pittsburgh Railways, are among the most recent to embark upon such a program. The former has established a de luxe bus service connecting Doylestown, Willow Grove and the center of Philadelphia. From Willow Grove to Philadelphia no service stops are made. The usual electric car service between the several points on the route has been retained, but a well-planned selling campaign was adopted for the bus service, this being directed at the well-to-do elements of the citizenry of Willow Grove and the other communities along the route. Luxurious 27-passenger gas-electric buses have been provided and the fare charged is considerably higher than the street car fare for the same trip. Similar services offered by the Pittsburgh Railways were explained in detail by T. W. Noonan before the C.E.R.A. at its recent meeting.

These are but examples of the broadening vistas for the bus. It is "custom-built" to fit individual needs of varying groups, while the street car must always be ready on the shelves of the transportation merchant.

Something Different in Fares and Public Relations

UNUSUAL circumstances attended the settlement of the recent fare case in Fort Worth, Tex., an account of which appears elsewhere in this issue. The railway concerned is the Northern Texas Traction Company, 1924 Coffin prize winner. Its approach to the matter differed in detail from the general procedure. In this respect and in respect to the system of rates suggested the case is of interest to the entire industry. The negotiations culminated in the City Council authorizing the rate readjustment by unanimous vote. It was a remarkable demonstration of public good will. The whole proceeding occupied a period of only two months. This in itself is remarkable, but, more remarkable still, not a single letter or protest appeared in any of the newspapers during all this time. At no time in any of the conferences did the company's lawyers participate in the discussion. The company took the position that this was not a legal but a business matter and that it should be handled in a business-like way with technicalities avoided. For taking this attitude the company was complimented by the members of the Council.

So much for the spirit of good will that pervaded the negotiations. Now for the increase and its significance. The new rates contemplate a 10-cent cash fare, three tokens for 25 cents and a pass costing 40 cents a week which entitles the holder to a wholesale rate of 5 cents per ride. This type of pass is somewhat of a departure in charging for railway service. On twelve rides a week the average fare on the ticket is 8⅓ cents, the same as the token rate. All rides that the passholder takes in addition to twelve a week are likely to be in off-peak periods. The company, it is understood, feels that the nickel pass has many advantages over the weekly pass. A supposititious case is that if the company had adopted the weekly pass at $1.25 the passenger would have to use the pass more than fifteen times a week to save any money under the token rate, whereas the feeling of the Fort Worth management is understood to be that the rider is entitled to begin saving as soon as he has exceeded the twelve-ride-per-week mark. Moreover, the buyer of the nickel pass puts up only 40 cents, and if he should be unable to use the ticket for a part of the week, he has less to lose than on the $1.25 or $1.50 weekly pass. The company estimates that 25 to 30 per cent of the passengers will ride on the nickel pass.

As for the actual change in the system, it appears to have been put into effect with unusual celerity. The whole proceeding carries a lesson to the industry, a lesson showing the influence exerted in behalf of a company that has the public good will, and a lesson of the resourcefulness that is constantly seeking to make the electric railways of greater value to the communities they serve while at the same time they strive by wholly legitimate means to turn to their own advantage every resource that may increase earnings.

Two Worth-While Educational Activities

PROVISION for the training of foreman-conference leaders and a study of the methods of training car and trainmen are two aspects of the work of the American Association committee on education on which it has decided to concentrate its attention this year. The decision was reached at the meeting held at Toledo this month in connection with the C.E.R.A. meeting.

Both of these subjects are of vital importance. One relates to the supervisory force, where training in the duties and opportunities of foremanship is both needed and desired; the other is in a field where vast sums of money are spent annually and where a small improvement will net a large return.

The committee on education has through its studies, recommendations and demonstrations awakened a real interest in foreman conferences and other forms of supervisor training. Assent to the need for such training is freely given by all managers who have familiarized themselves with the information now available regarding its possibilities. This assent is based on the conviction, first, that foremen as a class have not realized the full potentiality of their position as intermediary between the men and the management, and, second, that foremen welcome an opportunity to study their jobs as foremen and to appropriate the fruits of modern development in the art of foremanship.

When the problem of the foreman conference is considered, the first question that arises is, Who will lead it? The success of a series of conferences obviously lies largely in the leadership. A high official cannot be leader of a conference of the type that brings out informal and profitable discussion on foremanship. Except in rare cases, men hesitate to disclose their thoughts about their own jobs before an official on whom they wish to make a good impression. The leader must be a man whose position with the company or outside its ranks is such that the standing of the foremen cannot possibly be affected by anything they may say in his presence. And he must have their confidence in his ability to keep to himself what he hears.

Whoever undertakes the leadership of a foreman group will benefit by study of the experience of other leaders. Much material is available through books and pamphlets, particularly those prepared by the Federal Board for Vocational Education. State educational boards, also, stand ready to assist in practical ways. They should be consulted freely. If in addition to these sources of information and leader training the committee on education can directly and indirectly provide further opportunities, countrywide as well as local, for special training of electric railway foreman-conference leaders, the path of the manager who wishes to furnish foreman training on his own property will be made smoother.

The second proposed activity of the committee, training of platform men, is an entirely different matter. There is a real need here also. That present practice is not altogether satisfactory is indicated by the spirit of investigation everywhere apparent. Railways are sending out representatives to study training methods elsewhere so that their own may be improved.

Campaigns such as those for accident reduction, merchandising transportation and energy saving emphasize the qualities needed in the present-day motorman, conductor or operator. The present liberal wage scales warrant high-grade service on the platform. This means training of a new order. The committee on education can help here by formulating, for discussion and adoption by the industry, those fundamental training principles which must be followed in developing the 100 per cent 1927 trainmen.

Courtesy Declares Dividends of Good Will

FROM far off Buenos Aires comes a problem in courtesy some form of which is met with every day by the American motorman and conductor. According to the Buenos Aires *Standard*, a tram guard's problem is difficult in that city. If he invites a passenger to take a seat instead of standing on the platform he is abused for his pains. On the other hand, if he does not invite the passenger to be seated when there is room, he runs the risk of being accused of neglecting his duty. This is the old case of being between the upper and the nether millstones. Undoubtedly there are many people who travel today who have no consideration or discretion, much less courtesy. Dealing with such people presents one of the most important phases of public relations work, in which the platform men should be made to realize that they can be of enormous assistance to the railway companies.

In the last analysis, the motorman or conductor is the company. Upon his ability to analyze human nature rests the success of the company in winning public favor. While it is difficult to keep one's temper when placed between the upper and the nether millstones, it will be a comforting fact if the motorman or conductor is reminded that the only solution of the problem lies in continual courtesy, which, like water washing on a stone, eventually will penetrate surface resistance. The trouble about so-called courtesy is that it is often manufactured politely and is as different from the real article as education is from culture. A real exponent of courtesy is a person upon whom no amount of rudeness can have any effect. Courtesy, the aristocrat of social relations, is found on every step of the social ladder.

We cannot, however, expect the courteous employee to anticipate all of the public relations problems encountered during a ten-hour tour of duty on the platform. Hence it seems the practical thing to assign a specialist to this question with the idea of preparing a skeleton course in platform etiquette. It will be well worth the expense when we bear in mind that a courteous platform man declares daily dividends of good will for his company.

A Reorganization That Saved the Original Investment

FRANK, indeed, in what it told was the paper presented by Robert M. Feustel before the Toledo meeting of the Central Electric Railway Association. The very title of the paper, "Financial Reorganization Saved the Original Investment," was provocative in the disclosures which the title implied. And Mr. Feustel did not disappoint his audience. It is impossible here to recapitulate what Mr. Feustel said. The facts set down by him do not lend themselves to such treatment, but the author was on firm ground when he made the suggestion that some years ago it would have been rank heresy for a utility operator to have admitted that outstanding securities were greater in face value than the actual money invested in physical property. Indeed it would. More's the pity. He was on thoroughly sound ground, too, when he said it had always seemed to him that the utility operators had failed to make the most before utility commissions of the very natural and logical history of the growth of their financial structures. What is most important, he backed up this statement with the reasons for making it.

The problem in the case of Mr. Feustel's property was no different from that presented in many others. Within a period of fifteen years poor guesses as to the choice of territory in some cases and the development of the automobile in all changed what was a perfectly legitimate business enterprise into a task for salvaging. And the salvaging was intelligently done. Money had to be found to better the service and so increase revenues. And that money was found. First mortgage bonds were cut in amount from $9,000,000 to $4,700,000. It wasn't easy to do this. The new securities equaled in face value all of the cash which had been put into the property, including the foregone interest for the three years of default. As things stand now the first mortgage represents only 35 or 40 per cent of the investment, a very different financial set-up from that with which the company started.

Mr. Feustel is over-modest when he says that there is nothing at all remarkable about the plan outlined except that "the new securities did represent all the cash in the properties at face value and were so arranged that future financing would be accomplished, and if earnings would have been low the sheriff was not so near." Particularly was he not condemnatory of the *entrepreneur*. It seemed to him that the original financial structure was a perfectly logical outcome of the highly competitive condition under which the early electric railways were built and that the promoters were well entitled to any profits they could make in gathering so much money into the development of the new and still speculative utility field. With that point of view ELECTRIC RAILWAY JOURNAL is in thorough accord. All in all, Mr. Feustel told a story that the industry needs to have on the records, a story that substantiates the position taken by the committee on finance. On this occasion the need is not to scoff at what was originally attempted, but to proclaim what was eventually accomplished.

Three Classes of Service,

Says T. E. Mitten

Must Be Recognized by Local Transportation Men

Some of us are trying to sell cotton goods in a silk age. The quality of local transportation service has not kept pace with the changing demand of the times. A constantly increasing standard of service at a fair price should be the objective of the industry

AN INTERVIEW BY
Charles Gordon

T. E. Mitten

THERE has been considerable interest—and some skepticism—throughout the transportation world in the steps taken during recent years under the direction of T. E. Mitten to develop all branches of local transportation in and around Philadelphia. Co-ordination to his organization has meant not only cars and buses, but taxicabs as well.

Because of the bold steps which have been taken in putting together various transportation agencies in Philadelphia, I sought an interview with Mr. Mitten to get his ideas regarding the future of the industry. And it didn't take very many minutes to find that taxicabs and buses notwithstanding, Mr. Mitten continues to look on the electric railway car as the backbone of a co-ordinated system of city transport. But more on that subject later.

Mr. Mitten received me in his office in the new Mitten bank—another example of the man's daring ideas. This latest enterprise, like most of his other ventures during recent years, is an outgrowth of his hobby—mutual ownership by employees and management. Whether or not his ideas are generally applicable only experience will tell. But that they are audacious and interesting is apparent beyond question. He did not talk much about the bank and I did not press him on this feature of his plans, as my purpose was to get his views on more direct transportation subjects. However, the bank is a sidelight on the man, and illustrates how far out of the beaten track he has the courage to go in the development of his ideas. Employee-management co-operation had much to do with its inception. One of its features is understood to be a trust department operated at cost, to administer the estates of stockholders and depositors—and of course the employees of the transportation company may be expected to represent a major element in both groups. The average estate of P.R.T. employees amounts to about $3,000. This is a tidy sum. Though Mr. Mitten did not say so himself, I am told that one of the motives that led to the bank was the effort to help in conserving these estates and to protect both employees and their families from the ravages of the shyster lawyer and the fake stock salesman.

I let my imagination run a little as a former street car conductor resplendent in gray uniform and shining hardware ushered me into the bank elevator. When the company needed capital recently it sold preferred stock from car platforms—$10,000,000 worth of it in ten days! Deferred payments are made to the conductors by a transaction little more complicated than the issuance of a transfer. Bankers long ago discovered that people save more if you put a branch bank near at hand. From the making of stock installment payments to the conductor to making savings deposits on car platforms doesn't seem like a long step. No wonder that Philadelphia bankers are watching Mitten with great interest.

Although the bank is beside the real subject, it forms a background for the study of the characteristics of the man interviewed. He is generally considered a radical in the electric railway industry—and he probably is. But since the industry as a whole suffers from over-conservatism, his views on the industry's future and the objectives he has in mind as the goal of his daring moves during the past few years rank him as a distinct optimist on electric railways. Not only is that true, but he is also an optimist on the future of the street car as an agency of public transportation, once it has been developed and applied in combination with other forms of transportation, in a way to take advantage of its inherent service characteristics. Mr. Mitten made all this evident quickly at the beginning of our talk.

Since his acquisition of the Yellow Cab Company of Philadelphia is one of his most recent steps toward complete co-ordination of all facilities, that was a good place to start the questions, to find out just what had led the P.R.T. to acquire the cab company.

"It is the local transportation company's job," he said,

IN DEMOCRATIC America we don't like to admit class difference in anything—but we have it nevertheless. . . . We have three classes of service at three different rates. Once we recognize that condition fully we'll begin to make real progress in development. The bus is the middle class vehicle. It fits between the street car and the individual automobile or taxi. When combined, these three agencies form a complete local transportation system, but we still have considerable to learn about how to utilize each form of vehicle in such a co-ordinated system, and how to build a proper rate structure for the various classes of service given.

"to furnish every form of service required by the public. As we lose the short-haul rider and the strangers in our city with the development of the automobile, why let them go to some other agency that can make a profit from carrying them? The demand for transportation all over this country has been growing rapidly in quantity but changing at the same time in character. Why should we sit by and lose a large proportion of riders who are willing to pay the price of a taxi ride when we can haul them that way at a profit?"

That sounded like good business sense, and so without trying to get further into the taxi matter, another question was ventured in the direction in which I was more particularly interested. "What about the buses, Mr. Mitten, are they going to replace street cars?"

"Not by any means!" was his emphatic reply. And then he asked me a question. "Why do that? What good would it do?

"Substitution of buses for street cars would make no particular improvement in the situation as regards congestion. That would constitute a change without any fundamental advance in transportation facilities, either as to quantity or character. The electrically propelled vehicle has one inherent advantage that we have not talked much about, but which is distinctly in its favor nevertheless. It can be operated under ground and does not produce a gas problem. The great proportion of the people who ride in public vehicles must be taken off the streets in the congested areas and carried in underground streets—for that is all subways really are. In most cities of major size in this country there is no other alternative."

This seemed perfectly sound reasoning, but I did not feel that it covered the whole situation, and so I ventured another question.

SURFACE CARS UNDERGROUND ONLY IN CONGESTED DISTRICTS

"Does that mean, then, that you accept the idea that transportation of the future will be furnished entirely by subways underground along main traffic routes, with buses on the surface to act as feeders, so that street cars will ultimately be no longer necessary?"

Here again Mr. Mitten refused to accept the opinion expressed by others and showed the independence of his thinking.

"I don't think that follows at all," he said, "except in New York, where there are special conditions not comparable with the situation in any other city in the country; any system of subways in other American cities extending beyond the central congested business district would be needlessly extravagant and inconvenient. There is no particular reason why a passenger should have to transfer from rapid transit lines to feeders and vice versa in order to get from his home to his place of work. If you figure time from his door to his office, under such a system it is questionable whether any actual time would be saved in the average city over a system in which the car took him within convenient distance of his home without a transfer after leaving the business district. Certainly there is serious delay in getting through the congested district in most cities. Therefore the thing that is needed is to put the street cars underground when they strike the congestion. On the surface extensions therefrom, they should be operated over routes that would move the greatest possible number of people to their homes with the minimum of inconvenience."

DIFFERENT KINDS OF SERVICE NEEDED

Here Mr. Mitten launched into a very significant part of his discussion.

"One of our troubles in city transportation today is that we are trying to force everybody to use one class of service, whether they want it or not, and that service, from the standpoint of comfort and convenience, is the lowest in grade that the public will bear. In Europe they are just beginning to conceive the real meaning of co-ordination in the sense of tying together various transportation agencies to give the greatest possible variety of service at maximum efficiency. If we don't look to our laurels we'll soon be looking to their leadership. In democratic America we don't like to admit class difference in anything—but we have it nevertheless. On the railroads we have it and it is also an established fact in local transportation, whether we admit it or not. We have three classes of service at three different rates. Once we recognize that condition fully we'll begin to make real progress in development. The bus is the middle class vehicle. It fits between the street car and the individual automobile or taxi. When combined, these three agencies form a complete local transportation system, but we still have considerable to learn about how to utilize each form of vehicle in such a co-ordinated system, and how to build a proper rate structure for the various classes of service given."

At this point Mr. Mitten threw precedent to the winds.

"What do you consider the proper measure of service for the basic or lowest rate agency?" I asked.

"A seat for every passenger is the only acceptable standard," he said. "One of the fallacies in present-day thinking on transportation is that we have started with the assumption that such a standard is impossible. I don't agree with that at all. By providing prepayment facilities in surface car subways under the greater part of the business district in a city like Philadelphia, practically any car when properly equipped with safety devices can be operated with one man. Since platform labor is at least 50 per cent of present operating costs, it is evident that such a saving would enable a much higher service standard than at present can be attained. The increased speeds that would be possible would enormously increase the present capacity of the downtown tracks.

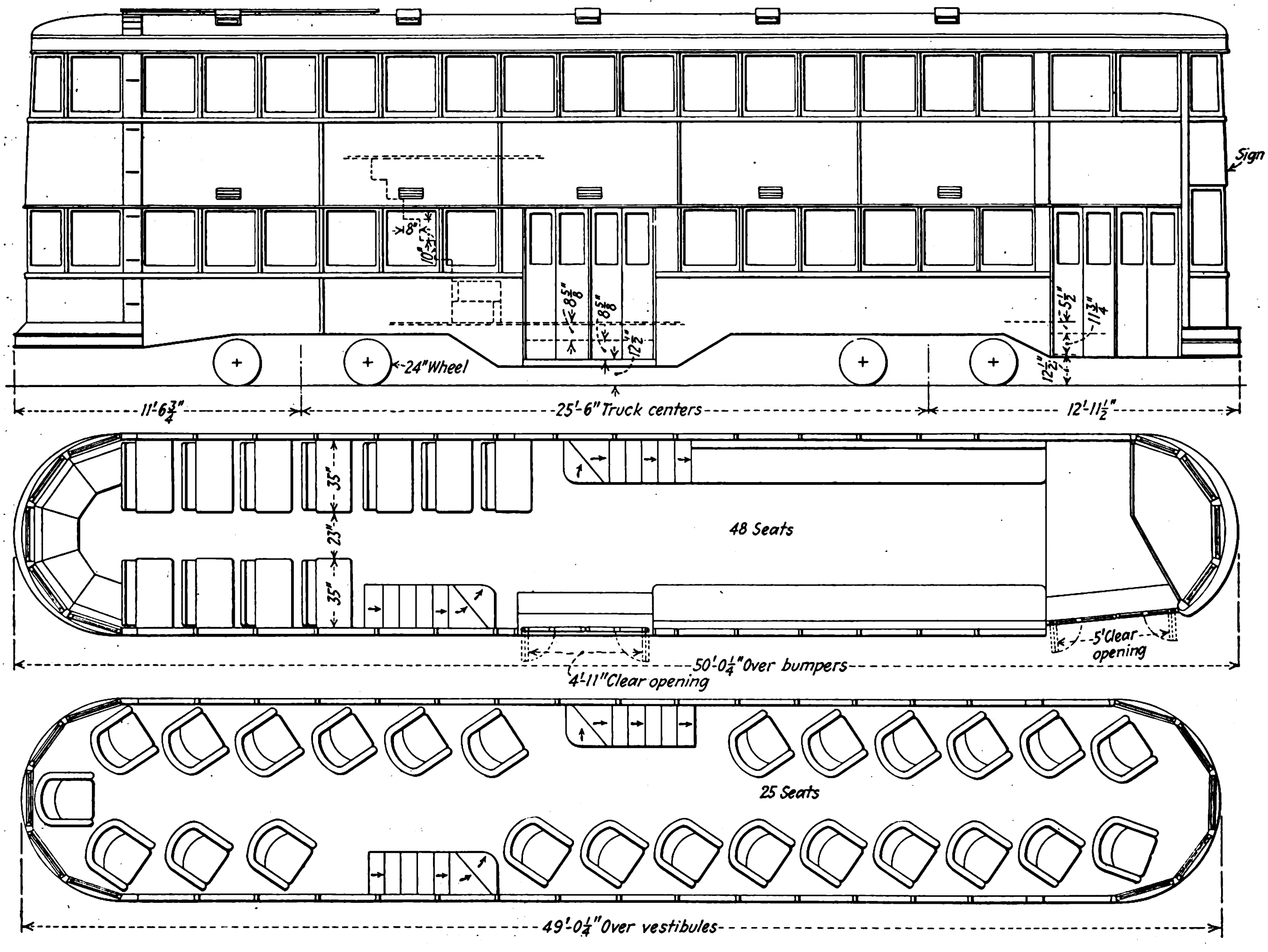
There seems to be no good reason whatever why every passenger cannot be given a seat, and why the rate of fare cannot at the same time be held at a reasonable figure for this popular class of service. Beyond that point the bus plays its part. By putting cars underground and operating buses on the surface, the capacity of the business districts will be increased. At the same time the bus has desirable flexibility for surface operation in the business districts. But its service should be maintained on a distinctly higher level at higher rates. Since it is possible for buses to pass each other going in the same direction on a given street, special express service can be given. This can be developed into a distinctive service at rates of fare which are a proper measure of the value of the service given. And there you have the picture. Beyond that point is the individual vehicle, for those who are willing to pay more for individual service. Each of these agencies, has its own distinct field to serve, and a live transportation company should be in position to furnish any class of service that is wanted. It is a serious mistake to try to bring all transportation to one class, or to permit other agencies to step into a city and take all of those riders who are no longer content to utilize the popular service at minimum cost."

Peter Witt Designs New De Luxe Car

PETER WITT, Cleveland consulting railway expert and car specialist, has just designed a new double-deck de luxe car with which he hopes to increase revenue without a corresponding advance in the cost of operation. To accomplish this Mr. Witt has planned to fit the upper deck with revolving chairs, for which there will be an extra charge. Twenty-five passengers are to be accommodated on the upper level, which is reached by two sets of stairs within the car.

By skillful planning, the main deck is arranged to seat 48 passengers and still leave ample room for standees and for free passage to the upper level. General dimensions of the car are as shown in the accompanying table.

Length over bumpers	50 ft. ¼ in.
Length over vestibules	49 ft. ¼ in.
Height over all	15 ft. 0 in.
Truck centers, two trucks	25 ft. 6 in.
Maximum headroom, upper level	5 ft. 6 in.
Maximum headroom, lower level	6 ft. 6 in.
Side-front entrance, clear opening	5 ft.
Side-center entrance, clear opening	4 ft. 11 in.
Height rail to first step	12½ in.
Height, first step to platform	8⅝ in.
Steps to upper level	8-in. tread, 10-in. risers



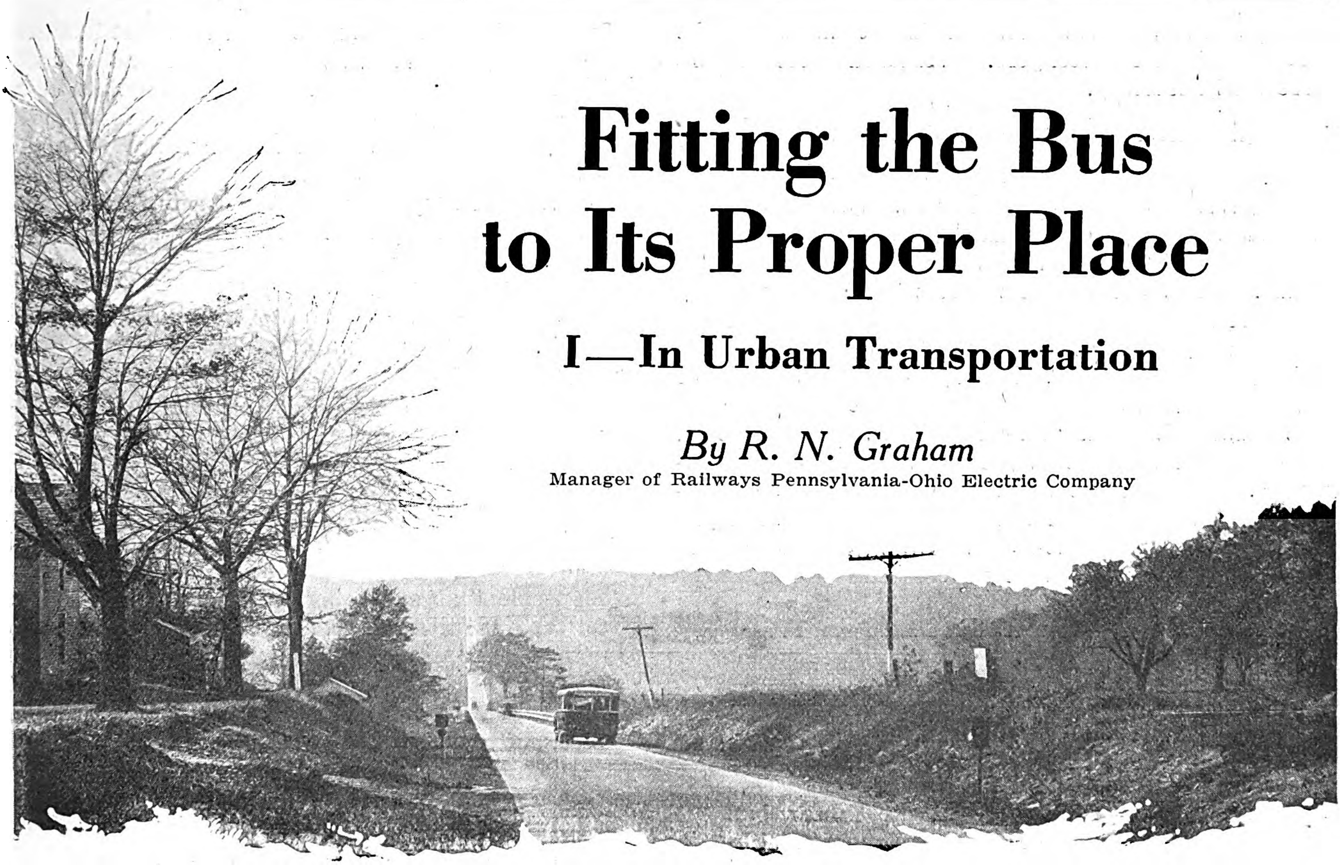
Side View and Seating Arrangement of Proposed Double-Deck Car

Fitting the Bus to Its Proper Place

I—In Urban Transportation

By R. N. Graham

Manager of Railways Pennsylvania-Ohio Electric Company



THE company with which I am connected has been operating motor buses for about five years. We have operated a total of 13,609,365 miles. Of this operation, about one-half has been city bus operation and about one-half suburban and interurban operation. The greater part of our city bus operation is in the city of Youngstown, Ohio, which probably has about 160,000 inhabitants. We have some city bus operation in New Castle, Pa.; Sharon, Pa., and Warren, Ohio, which are towns having from 20,000 to 50,000 inhabitants. We have a number of local suburban coach lines connecting Youngstown with surrounding communities and three real interurban operations, a line connecting Cleveland with Youngstown, a distance of about 70 miles; a line connecting Akron and Youngstown, a distance of about 50 miles, and a line connecting Youngstown with Meadville, Pa., a distance of about 70 miles.

THIS is the first of two articles on the motor bus, which reproduce practically in full an address made by the author before the Metropolitan Section, Society of Automotive Engineers, in New York on Feb. 17. The second article, which will be published next week, deals with interurban operation and certain features of bus design. The present article covers urban operation exclusively. It approaches the controversial bus-car question frankly and is one of the most able discussions of this subject ever published. Mr. Graham considers the bus to be a useful transportation tool and is interested in determining how best to use it. While he explodes some current claims for the bus and strikes directly at the "rubber urge" theory, he foresees for the automotive vehicle a much larger future in urban transportation than that of merely a street car on rubber tires. Every transportation man will be interested in what the author has to say. The JOURNAL will welcome comments by its readers on Mr. Graham's conclusions.

The gross revenue of our entire bus and coach operation for the year 1926 was $1,344,072.40. In the city of Youngstown during that year we operated 2,027,964 bus-miles. Gross revenue was $638,145.11 in buses. The gross revenue of both street railway and bus operation was $2,101,877.56. The number of passengers carried in Youngstown by street railway was 23,269,544, and by bus 10,380,431.

The first use of the bus in urban transportation by the Youngstown Municipal Railway was in September, 1922. An accompanying statement shows the gross revenue, passengers carried and bus-miles operated in the city of Youngstown for that year and each year since then.

You will note that we operate in the city of Youngstown about 80 street cars. This is about the same number that we operated in 1921. We now operate in the city 57 motor buses, but in 1921 we had none.

In our conception of our job in furnishing transportation to our communities, we differentiate in no respect between a street car and a motor bus. We view them both as proved agencies of transportation, as the tools of our trade. We do not intend to operate a street car where a bus can be more effectively used, neither do we intend to operate a bus where the use of a street car produces a more satisfactory result in the service to the public and in financial returns to our company.

Prior to 1916, like every other great industry in this country, the electric railway industry, which with steam shuttle service made up the only customary instrument of mass transportation, was extremely liberal in the use of man power from the fact that wages were low. With the increasing demand for man power and consequent increase of wages, the expenses of this industry increased enormously. Like every other industry, the relief was in an increase in the price of the product, which, in this case, was almost exclusively the carriage of local passengers. Increased rates of fare were thus necessary.

AUTOMOBILE COMPLICATED TRANSPORTATION SITUATION

However, unlike other industries, the price of the product could only be increased through a long siege of legal and political endeavors. In the very nature of human things the ultimate result would undoubtedly have been an increased price for the carriage of the public in the cities of the country proportionate to the increase in the expense, if there had not been another development contemporaneous with that which I have just described, greatly affecting mass transportation. This was the increase in the use of the private automobile. The increase in the use of the private automobile took away from the transportation industry a great part of its market at the very time when the cost of giving service was greatly increased.

THERE is hardly a city in the United States of 150,000 population that could not well support this supplementary service and the demand for vehicles for this service would furnish to the motor bus manufacturing companies a more stable market than the attempt to force into mass transportation at standard rates of fare vehicles wholly impractical to operate from a profitable standpoint.

I am reviewing very hastily this development of the decade from 1916 to 1926, because so many people have in their minds a conviction that electric railways in some manner failed to keep progress with the step of the world and because there is a feeling in many quarters that they are in difficulties because they are a passing or obsolescent activity. This confusion of thought is increased by the fact that during the very period that increasing costs and increasing use of the private automobile has embarrassed the street railway companies, the automobile bus has been under process of development, and the tendency has been to reason that the bus is a radically new type of transportation and that in some manner the difficulties of the railway companies are a natural result of the development of a new type of transportation which they either would not or could not use and which is to succeed the electrically propelled vehicle.

Since the problem of mass transportation as distinguished from a service primarily directed to the comfort of the individual is to provide for the carriage of people in groups from point to point in an urban community, it is evident that the generic problems facing such an industry are the same regardless of the vehicle used. There is little difference between the problems encountered in transporting a given group of people with a bus or with a street car. These are simple compared with the great problems facing either class of vehicle as a result of the constantly increasing use of the private automobile, or, on the other hand, the constant increase in operating costs.

To make this point plain, let us assume that in a given city every individual owns a motor car and every individual uses this motor car for any trips that he has to make in the city; there would be no controversy then about the fact that it made no difference whether a public transportation company engaged in business in such a city used buses or street cars; its fate would be certain no matter what vehicle it used.

THERE IS NO "RUBBER URGE"

However, when buses first became more or less generally used in this country, there was persistent talk of the "rubber urge." The idea back of this slogan was that the bus was so much more attractive a vehicle than the street car that people who were no longer customers of the mass transportation industry would again become customers if the bus were used instead of the street car. If this was not the idea, then there would be no advantage to either the transportation company or the public in simply transporting tomorrow on the motor bus the same people that are being transported today on the street car. In other words, the idea back of the "rubber urge" theory was that people who had ceased to ride street cars would refrain from using their private automobiles and avail themselves of public transportation if the bus and not the street car were offered.

It is impossible to define the use of the motor bus in city transportation without giving the most careful consideration to the question of whether this so-called "rubber urge" exists. If there is an impelling factor that will cause people to ride motor buses in preference to their private automobile when they would not avail themselves of other forms of public city transit, then the motor bus occupies an essentially different position than it does if its use is dictated by such factors as flexibility, convenience, economy, speed, etc. To deny this so-called psychic "rubber urge" does not deny the bus a place in city transportation any more than there is denied a place for subway service, elevated service, trolley cars or street cars of varying types. Proper consideration of the question of the existence of this psychological factor would perhaps in the past few years have saved many heavy expenditures. Too much consideration cannot be given to the problem of whether such an urge exists.

In the first place, inferences have been hastily drawn ascribing to this intangible factor facts to which it never contributed. For instance, let us take the ordinary city of this country in which the streets are laid out in checkerboard fashion, as is common in the Middle West towns. On one of these streets there is a street car line, and six blocks from this street and parallel with it there is another street car line. People living on the street half way between the two car lines are compelled to walk three blocks to either line. If a bus is operated on this street, these people will no longer walk three blocks to the car but will patronize the bus line. Here there is no "rubber urge." It is just a matter of greater convenience. The same fact would follow if a car line were built down the street in question.

PEOPLE WILL USE MOST CONVENIENT TRANSPORTATION

Let us take another street car line on which there is a ten-minute headway. If buses are operated on this same street over the same route as that of the street cars, and splitting the headway of the cars, manifestly if similar service is given and the trip takes an equal length of time, a part of the people will ride on the bus. This is not a result of a "rubber urge" but is merely again a matter of convenience.

There have been instances where street car tracks are worn out, the special work gone, the cars old, noisy and decrepit. When a bus entered into competition, practically no customers rode the decrepit utility. They patronized the utility which, under the individual circumstances, furnished them more convenient service. This again is not the influence of the "rubber urge" but is merely again a seeking by the customer of his own personal comfort and convenience. The same result would have followed if a different street railway company had laid new track down the same street, with new, modern, comfortable, easy-riding street railway equipment.

There are still other conditions existing which might lead to a confusion of thought in regard to the "rubber urge." For instance, a given street car route may cross a number of railroad tracks at grade, where there are many train movements or shifting movements, resulting in constant delays to the street railway service. There may be in the neighborhood some street traversing the same locality on which there is a separation of grade so that buses can be operated without the delays and discomforts attached to the steam railroad crossing. In that event there would be considerably more traffic given to such a bus line than to the street car line which had this disadvantage. If a new street railway line were constructed on the street having the grade separation it would possess the same advantage over the original layout.

Again, the street railway line may have been built to accommodate portions of the city as originally laid out, but there has been such a change due to shifting of population centers that there is a more direct route to where the population lives than is offered by the rail line. In such a case, either a bus or street railway line following the more direct route would naturally attract more travel than the old line.

After eliminating all these confusing factors, let us face the question squarely—is there an attraction in the bus itself, disregarding factors which can influence either bus or street railway traffic, that would cause more customers to use a bus service than a street railway service under similar conditions? Leaving out of consideration for the present the question of expense of operation of the two modes of transportation, the query as to whether such an attraction exists is a very important factor in determining whether buses are a substitute for or a supplement to the electric railway car in mass transportation.

TABLE I—GROWTH OF BUS OPERATIONS IN YOUNGSTOWN, OHIO, BY PENNSYLVANIA-OHIO ELECTRIC COMPANY. IN 1926 THE COMPANY OPERATED 80 STEEL CARS AND 57 BUSES

Year	Gross Revenue	Passengers Carried	Bus-Miles
1922	$28,453.56	510,929	112,901
1923	228,425.53	4,032,882	918,644
1924	444,700.25	7,387,091	1,511,091
1925	511,347.59	8,361,236	1,738,930
1926	638,145.11	10,380,431	2,027,964

YOUNGSTOWN AFFORDS COMPARISON OF BUS AND CAR

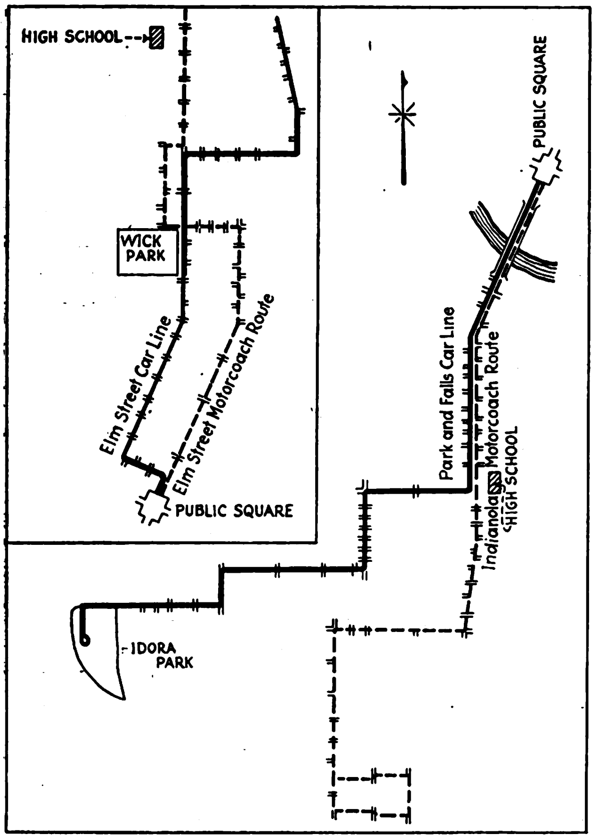
In our operation in Youngstown we have eight bus routes and eleven street railway routes. They are operated with the same rate of fare, the fare being 8 cents cash, tokens seven for 50 cents, and a transfer charge of 1 cent. All bus routes as well as all street railway routes are operated to the center of the city. There are no shuttle lines, either bus or street railway. The bus routes in general are extended into well built-up sections of the city. Duplicate service is not given. In general, the manner of operation for buses and street cars is substantially the same. As a result of five years of operation of bus lines in this manner, I would assert without hesitation that there is little preference shown by the citizens of Youngstown to either bus or street car, but where a choice can be exercised, the choice is generally in favor of the car.

Now I wish to call attention to a specific situation in which the materials for a test of the public's preference are, I think, complete and fair. There are in Youngstown a car line and a bus route which penetrate the same general territory. Both these routes are known as Elm Street. The Elm Street car line is 2.6 miles in length and the Elm Street bus line 2.5 miles in length. For the greater part of their distance they are separated by a distance of three blocks. For less than half a mile they are separated by one block, and for the remainder of the distance by five blocks. This bus route was one of the first of those operated in Youngstown. Service has been continuous on the route for almost five years. An accompanying table shows the service given and patronage on these two lines for the month of October, 1926.

HOWEVER, there is a fourth, and I believe even greater, field than any of those enumerated for the use of this vehicle, and that is as a special, supplementary service at a much higher rate of fare to furnish unusual convenience to customers who do not object to this higher charge. In the city of Pittsburgh there are at present being operated several bus routes from the suburbs to the heart of the city where a 25-cent fare is charged and these routes are being operated with a high degree of success.

The car-miles operated for this month were 22,236. Bus-miles were 21,873. Street cars made 7,846 trips and buses made 8,568. The off-peak headway on both car and bus lines was ten minutes. However, to give this off-peak headway required four street cars and only three buses. Therefore the round trip by cars took 40 minutes and the round trip by buses 30 minutes, so that the service by buses was speedier. This is the fact because a large portion of the car line is single track with passing sidings. On the other hand, only one tripper car was used and three tripper buses were required. The cars operated were the small Birney cars seating 32 people. The buses were modern single-deck equipment seating 25 passengers. The cars had slat seats; buses were equipped with leather upholstered seats. The track of the car line is in as poor condition as any we have in Youngstown, but would be considered fair, average city track.

Thus, with these two lines penetrating practically the same section of the city, operated with absolutely equivalent service at the same rate of fare, the revenue from



Above, Elm Street Car Line and Elm Street Motor Coach Route, as Referred to in Table II. Below, Park and Falls (Idora Park) Car Line and Indianola Motor Coach Route, Referred to in Table III. Car Routes Are Shown in Heavy Lines and Motor Coach Routes in Light Lines

TABLE II—COMPARISON OF OPERATING FIGURES FOR MONTH OF OCTOBER, 1926, ON ELM STREET CAR LINE AND SIMILAR BUS LINE SERVING SAME TERRITORY REFUTES THE EXISTENCE OF A "RUBBER URGE"

	Car	Bus
Length of line	2.65	2.5
Miles operated	22,236.78	21,873.8
Number of trips		
Scheduled	7,746	8,400
Trippers	100	168
Number of cars for base schedule	4	3
Number of cars for trippers	1	3
Maximum number of cars	5	6
Headway—offpeak, minutes	10	10
Headway—peak, minutes	8	6
Round trip—offpeak, minutes	40	30
Round trip—peak, minutes	40	36
Schedule speed	7.99	9.01
Revenue	$7,833.49	$7,585.08
Revenue per mile	0.3522	0.3467
Hours operated	2,781.05	2,427.58
Revenue per hour	2.817	3.132
Total passengers carried	126,355	127,103
Transfer passengers	23,531	23,933
Passengers carried per trip	16.1	14.83
Based on eleven months of 1926:		
Operating cost per mile	0.3102	0.2598
Operating cost per hour	2.8219	2.4291

TABLE III—COMPARISON OF IDORA PARK CAR LINE AND INDIANOLA BUS LINE IN YOUNGSTOWN FOR MONTH OF OCTOBER, 1926. SUPERIORITY OF ELECTRIC CAR FOR LONG-HAUL, LOW-FARE SERVICE, IS SHOWN

	Car	Bus
Length of line	3.76	3.55
To loop	2.75	
Miles operated	52,177.22	30,017
Number of trips—Park	8,664	8,224
Loop	7,414	....
Number of cars for base schedule:		
Weekdays and Saturday	12	7
Sundays	8	4
Number of cars for trippers	..	..
Maximum number of cars	12	7
Headway—offpeak—Park, minutes	10	12
Loop, minutes	5	
Headway—peak—Park, minutes	7	5
Loop, minutes	4	
Round trip—offpeak—Park, minutes	45	36
Loop, minutes	35	
Round trip—peak—Park, minutes	46	38
Loop, minutes	38	
Schedule speed	9.67	10.73
Revenue	$21,944.90	$7,709.90
Revenue per mile	.4205	.2568
Hours operated	5,397.37	2,796.54
Revenue per hour	04.065	02.756
Total passengers carried	359,476	121,937
Transfer passengers carried	66,412	17,521
Passengers carried per trip	22.35	14.82
Based on eleven months of 1926:		
Operating cost per mile	0.3102	0.2598
Operating cost per hour	2.8219	2.4219

the cars for the month of October was $7,833.49 and from buses $7,585.08. The total passengers carried on cars amounted to 126,355, while 127,103 were carried on buses; 23,531 transfer passengers rode the cars and 23,933 rode the buses.

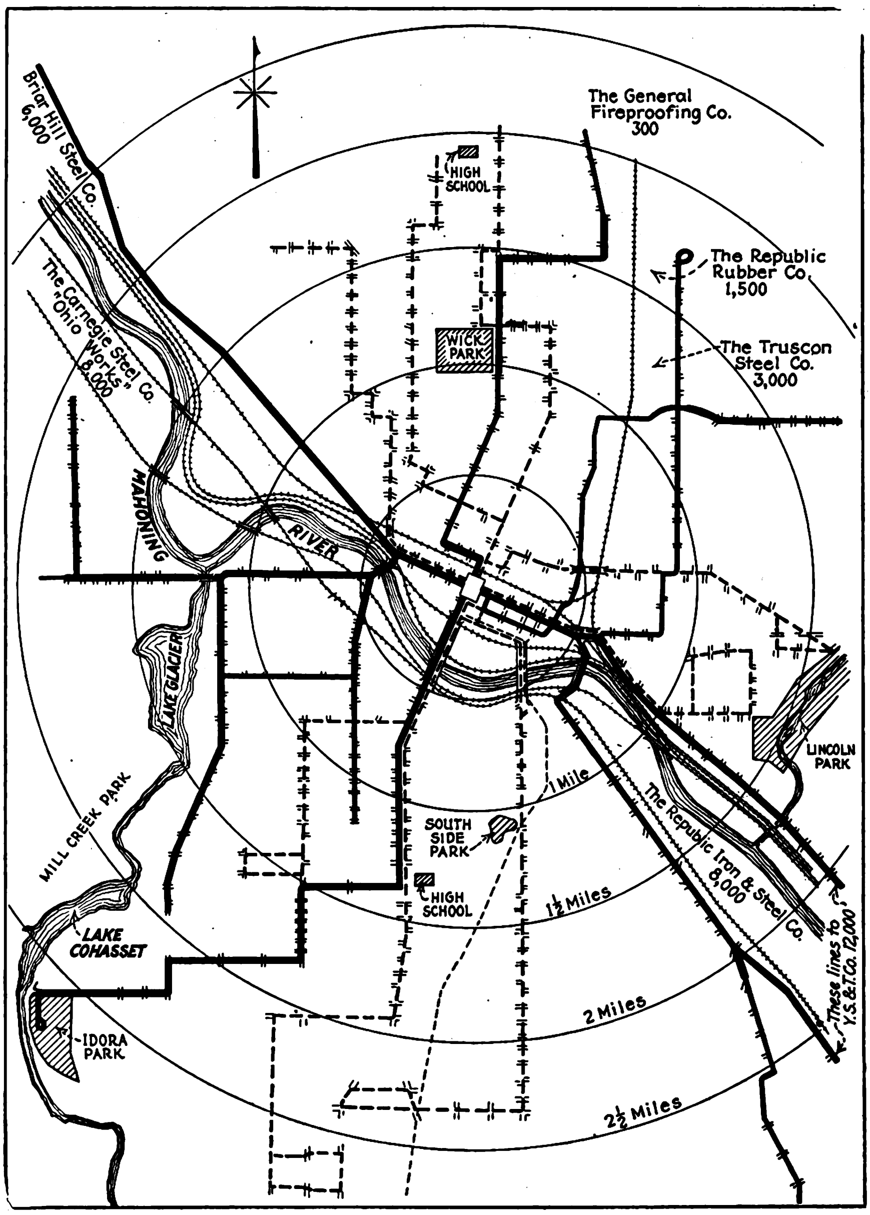
Now, I want to call your particular attention to the average number of passengers carried each trip. On the car this was 16.1, and on the bus 14.8. With a 25-passenger bus, an average load per trip, not round trip but one-way trip, of 14.8 is a very high load factor, being 60 per cent of the total seats offered. The car load factor is high, being 50 per cent of the total seats offered, but from this decreased factor of loading it is evident that more people enjoyed seats on the cars than on the buses. With the exception of the stretch of single track on the car line, there are no physical obstacles to the operation of either car or bus on either of these routes. There is a railroad crossing just outside the public square which holds up both bus and cars impartially. Both cars and buses are comparatively new, the cars being seven years old and the buses anywhere from one to four years old. Both buses and cars are clean and the schedules are well maintained. Both cars and buses are operated with one man each. The men wear practically identical uniforms and badges, and are well trained in courtesy and merchandising practices.

I believe that this exhibit indicates, or should indicate, to any unbiased and impartial observer who is interested only in working out intelligently the tools for mass transportation that there is no inherent attraction in the bus that would cause its choice as a vehicle by a prospective passenger in preference to using his own car that would not be equally applied in every respect to the street car.

BUS HAS BOTH ADVANTAGES AND DISADVANTAGES

I do not expect to carry conviction with a single isolated example. However, the example is a perfectly fair one. The result is confirmatory of our entire experience in this class of operation. I can hear immediately some one saying that the bus loads at the curb and the street car in the center of the street. This is true and in this respect is undoubtedly an advantage to the bus in attracting patronage. It is equally true that the standing passenger is more comfortable on the street car than on the bus, which is to the advantage of the street car. It is true that in congested areas the bus can make better time than the surface street car. It is also true that service with a bus is more flexible. There are many advantages offered by the one vehicle not enjoyed by the other, but in the main these are not fundamental. There is, however, one basic, serious and important distinction between the bus and the street car which at the present time sharply limits the use of the bus as an economic substitute for the street car in mass transportation, and that is its size.

It will be necessary for me here to call your attention to two outstanding features of American mass transportation which differentiate it absolutely from mass


Briar Hill Steel Co. 6,000
The Carnegie Steel Co. "Ohio Works" 8,000
The General Fireproofing Co. 300
HIGH SCHOOL
WICK PARK
The Republic Rubber Co. 1,500
The Truscon Steel Co. 3,000
MAHONING RIVER
LAKE GLACIER
MILL CREEK PARK
LAKE COHASSET
IDORA PARK
SOUTH SIDE PARK
HIGH SCHOOL
1 Mile
1½ Miles
2 Miles
2½ Miles
LINCOLN PARK
The Republic Iron & Steel Co. 8,000
These lines to Y.S.&T.Co. 12,000

Street Car and Motor Coach Lines of the Pennsylvania-Ohio Electric Company in Youngstown, Ohio. The Motor Coach Routes Are Shown in Light Lines and the Car Routes in Heavy Lines

transportation in any other country. You are familiar with the fact that in every city of the United States public transportation is conducted on a flat fare, that is, the fare per ride remains the same regardless of the distance carried. This has become so universally the practice and has been the practice for so many years that as a measure of practical expediency it may be said that it is impossible to change or uproot it. You will remember the costly and elaborate experience that was made by the Public Service Company of New Jersey in an attempt to inaugurate a modified form of zone fares in the United States, which attempt was utterly unavailable. There have been numerous attempts, the last one being in the city of Pittsburgh, to create an inner and an outer city zone with varying fares, and these have been generally unsuccessful. Consequently it may be taken as typical of mass transportation in our country that the fare, whatever it shall be, is the same for any ride in the metropolitan zone, whether the ride be for one block or a distance of 9 or 10 miles.

The other distinguishing feature of mass transportation in this country is that with very few exceptions the maximum capacity of the vehicle is used only once on a single trip. With these few exceptions, there is no intermediate riding. In many foreign cities where the country has been for a long time in a high state of development and thickly settled, there are metropolitan areas which are really an aggregation of smaller urban communities. On a single transportation route there are many points on a one-way trip where passengers board and where passengers get off, so that the seating capacity of the vehicle is used over and over on a single trip. In the United States the growth of the cities, in the main, has been like the growth of fresh wood on a tree. The city extends outward in every practical direction from the nucleus first established. As a result of this, whether you go to Cleveland, Chicago, Kansas City, Omaha, Dallas, Houston or Los Angeles, you will find that there is little intermediate traffic. In the morning the workers in store and office ride from their homes to the store and office. In the evening they ride in the reverse direction. During the day there is the single ride from the home to the theater, to the shops and stores and then the ride home. But on any given trip the maximum capacity of the vehicle is in use but once. It is, therefore, a matter of the simplest elementary arithmetic to ascertain the earning capacity of a vehicle for at least 95 per cent of the trips in our cities.

LOAD FACTOR IS LOW

Mass transportation must begin in the early morning, when people commence to move to their work, and ends at night when the last theater, church or public entertainment closes. Consequently the vehicles of any public transportation system must be operated for eighteen hours. During the rush hour in the morning the movement is all from homes to shops, stores and offices. In the evening the movement is in the reverse direction, so that even in peak hours the greatest traffic or movement is only one way. Between the peak hours of the morning and the afternoon and throughout the period when the vehicles are moving at night the traffic is small compared to that offered during the heavy hours. Therefore, in any public transportation utility, we find that there are not as many passengers as the seats offered by all vehicles during the entire period of operation. What we may term the load factor of such a utility is the ratio of passengers carried on all trips to the seats offered on all trips. This load factor for all the cities of the United States will not run above 40 per cent.

It is very plain that if we take the seating capacity of any public transportation vehicle, multiply it by the load factor we may expect and multiply that in turn by the average rate of fare, we will get the earnings of such vehicle on a single trip. If we divide this sum in turn by the number of miles operated on such a trip, we have the earnings per mile. By taking general statistics good for the whole United States, we can reach a general figure of what earnings to expect per mile on any given vehicle.

The average fare per cash passenger in the United States today is 7.6 cents. The average fare per passenger, including transfer and free passengers and school rates, is approximately 7 cents per passenger. Therefore, if we take a 25-passenger bus with an ordinary load factor of 40 per cent, the average rate of fare of 7 cents, we get 70 cents per average trip. If the length of line is 2 miles, we get 35 cents a mile. If the length of line is 4 miles, we get 17.5 cents per mile. If the vehicle accommodates 50 passengers, then we will get per trip $1.40; if a 2-mile trip, 70 cents per mile, or if a 4-mile trip, 35 cents per mile. It is thus immediately apparent that there is a definite limit to the distance which the small vehicle can be operated. In order to reach this conclusion, we do not have to go very seriously into the question of operating costs. With our five years of operating experience as a basis for buses in city transportation, we are convinced that a fair figure for operating cost of a single-deck, 25-passenger bus is 25 cents without reserve for depreciation and 30 cents including all reserves. Our conclusion on this subject has been backed up by all the operating figures to which we have had access.

> **THE history of present day transportation in all American cities shows that while the community as a whole may fight to the last extremity for a low rate of fare, there are certain elements in the community who pay little attention to the cost of transportation as long as such transportation is speedy and comfortable.**

OPERATING RADIUS LIMITED BY FARE

If it costs at the rate of 30 cents per mile or even 25 cents per mile to operate such a bus, it is apparent that using the general figures throughout the United States for load factor, average rate of fare, the operating radius of the single-deck bus seating 25 people is very little more than 2 miles. However, it must be conceded that the smaller the vehicle the higher will be the load factor. Let us assume, for example, that for a given operation a minimum of six or seven passengers are carried on an average trip. This minimum will contribute more to the load factor of a vehicle seating 25 than it will to a vehicle seating 50 passengers. We may therefore assume that in the case of small vehicles the load factor will reach 50 per cent, or, under extremely favorable conditions, 60 per cent. With a load factor of 60 per cent on a 25-passenger vehicle, there will be fifteen passengers on the average for every trip, one way, during the entire period that the vehicle is operated. Applying the average rate of fare, we would have $1.05 for a trip, producing an operating revenue of 35 cents per mile for a 3-mile trip. This is, manifestly, the absolute limit to which a 25-passenger bus can be operated at a profit on the present average rate of fare.

I now wish to again refer to the comparison between the Elm Street bus and street railway lines. An accompanying table shows the operating figures of these two lines. The revenue per car-mile is 35.22 cents and the revenue per bus-mile is 34.67 cents. The operating cost per car-mile is 31 cents and per bus-mile practically 26 cents. In both cases, to make the results comparable, no depreciation or other reserves, or any return on the investment, is included. The street cars used on this line are the small Birney 32-passenger cars, so that the load factor in both the case of the cars and buses is high, there being sixteen passengers carried per car trip and 14.83 per bus trip. With a seating capacity of 25 passengers on the bus, the load factor is nearly 60 per cent. On a line of this length, it is evident that the bus is the better transportation medium from the standpoint of the public utility giving the service. By the use of a larger street car, the car-mile earnings might, perhaps, be increased, but only by decreasing the headway, and a decrease in headway would probably reduce patronage.

Now let us compare this situation with a case where we again have a bus line and car line going into similar territory, but where the lines are much longer. Such an example is offered by the Idora Park car line and the Indianola bus line in Youngstown. In this case, the car line is double-track and modern cars seating 54 passengers are used. The car line is 3.76 miles long and the bus line 3.55 miles. The buses are the same size as are used on the Elm Street line and the loading is the same, being 14.82 passengers per trip, or again, almost a 60 per cent load factor. Here the revenue per car-mile is 42 cents and the revenue per bus-mile is less than 26 cents. The cost of operation per car-mile is 31 cents and per bus-mile 26 cents. Thus it is evident that here we have an operating profit of 11 cents per mile on the street car while we are operating the bus line at an actual operating deficit, and yet, from the standpoint of traffic, the line is as good as the Elm Street line. In fact, with a 60 per cent load factor, it may be said that the buses on the line are saturated to such an extent that it was necessary materially to increase the number of buses in the following month, which, of course, reduced the load factor and reduced the bus-mile earnings.

TABLE IV—VARIATION IN COST OF MOTOR-BUS OPERATION IN YOUNGSTOWN WITH AGE OF EQUIPMENT. FIGURES ARE IN CENTS PER BUS-MILE. MR. GRAHAM ADVOCATES CHARGING HIGHER DEPRECIATION RATE DURING EARLY LIFE OF BUSES

	Sept.-Dec. 1922	1923	1924	1925	Ten Months 1926
Equipment	2.63	3.21	4.76	5.46	6.15
Conducting transportation	11.83	13.47	15.19	15.34	15.48
Traffic	0.00	0.01	0.00	0.00	0.00
General and miscellaneous	2.03	3.42	4.06	3.54	4.18
Total operating expenses	16.49	20.11	24.01	24.34	25.81
Taxes	0.65	0.48	0.97	0.86	0.66
Depreciation at 25 per cent per year	2.31	2.98	4.22	3.93	2.83
Interest	0.77	1.01	1.00	0.96	0.92
Total fixed charges	3.73	4.47	6.19	5.75	4.41
Cost of service	20.22	24.56	30.20	30.09	30.20

Therefore, reasoning from these two examples, we would say that with a bus seating from 25 to 29 passengers on a line practically 2½ miles long the bus is a better transportation medium than the street car, but on a line 3½ miles long it cannot be operated except at a positive loss. On the two lines compared the only difference is in the length of trip.

These two typical cases prove the formula we have just asserted. If, on the line 2½ miles long, with a very high load factor, we get a revenue of 35 cents per mile, we should naturally expect on a line 3½ miles long with the same rate of fare and with the same load factor to have the bus-mile earnings reduced in the exact proportion as the length of line is increased, and this is just exactly what has happened in these typical cases. Therefore, we have assumed, first, that single-deck buses cannot be operated at a profit even under the most favorable conditions of traffic at a city rate of fare for a distance longer than 3 miles. Second, that the only change in the situation that will permit the operation of a single-deck bus for a distance longer than 3 miles for a profit will be a substantial increase in the seating capacity of the bus. This increase must be substantial because it is entirely practicable to operate street cars seating as many as 60 passengers with a single man.

It may be argued that one remedy would be to increase the average rate of fare. The street railway industry has been carrying on a campaign for ten years to increase the average urban rate of fare and has progressed from 5 cents to an average of 7.6 cents, so that there would be very little chance of increasing the average rate of fare sufficient to overcome the penalty of the small seating capacity of the bus.

The next point that arises is the question of increasing the size of the bus. If this increase is brought about by an upper deck, such increase is of no practical value in the average American city. The double-deck bus would require two men and the only hope of transportation at our ordinary city rate of fare is the elimination of the second man on every transportation vehicle. To use a bus with two men in comparison with a street car operated by one man would cause the operating cost of the bus to be greater than the operating cost of the street car.

It may be argued that double-deck buses could be devised and have been devised to operate with one man. Here we enter on another extremely dangerous ground, that of the avoidance of accident cost. Twenty years ago the wheel height of the standard American street car was 34 in. At present the wheel height of the standard street car is 26 in. It has required the combined resources of the business over a period of twenty years to reduce the floor of our cars 4 in. for the purpose of eliminating the accident hazard attached to the carriage of the public in mass transportation. To arbitrarily add 6 ft. to the height which any of the passengers have to negotiate in order to reach their seats without the attention of a second man to regulate the motion of the vehicle would be utterly impracticable to the ordinary operating company.

It is impossible for me to understand how it can be argued that a 25 or 29-passenger bus can be successfully and economically operated on an average city route of more than 3 miles. There can be no question about the fact that our business, taking the country over, is without intermediate hauls. There can be no question about the load factor that can be expected. There can be no question about our average rate of fare. Therefore, to expect such a vehicle to prove profitable in operation on a long trip is an arithmetical impossibility.

BUS FIELD LIMITED FOR MASS TRANSPORTATION

You may therefore ask, where is the field in city transportation for the 16 or 21-passenger bus? My answer to this is that there is no such field in city mass transportation.

Where, then, in our cities can the 25 or 29-passenger bus be used? First, on routes not to exceed 3 miles where the traffic is dense. Second, on routes longer where through unusual or peculiar conditions there is intermediate traffic. For instance, crosstown lines crossing several street railway or other public transportation routes where passengers get on and off at many different transfer points might readily build up the bus-mile earnings to such a point as to render the use of the bus feasible. Third, and this I regard as the most important present use of the bus in urban transportation, to furnish service in territory unserved by street car lines in a city where the financial condition of the street railway company forbids the installation of track but where the rendering of some form of transportation service is necessary in order to round out the function of the utility as a giver of transportation service in such community.

WE KNOW that the American public is vitally opposed to a sweeping increase of fare for every one. On the other hand, there is no reason why any one should object to a higher fare for specialized service, when such specialized service does not interfere with the regular service given at a regular rate of fare.

On our property all our long bus lines are operated for this reason and for no other reason. They are operated at a loss in order to give the public, as a whole, transportation to all parts of the community.

AN UNLIMITED FIELD FOR SPECIAL SERVICE

However, there is a fourth, and I believe even greater, field than any of those enumerated for the use of this vehicle, and that is as a special, supplementary service at a much higher rate of fare to furnish unusual convenience to customers who do not object to this higher charge. In the city of Pittsburgh there are at present being operated several bus routes from the suburbs to the heart of the city where a 25-cent fare is charged, and these routes are being operated with a high degree of success.

You see, it does not make any difference which factor of our equation we change; we can increase the bus-mile earnings through raising the fare, reducing the length of the trip, increasing the size, or increasing the load factor. If we triple the average rate of fare, we can either triple the haul or we can reduce the size of the bus. It is perfectly practical to operate a 21-passenger bus at a 25-cent rate of fare where it would be impossible to operate a 29 or 25-passenger bus at the standard rate of fare.

We know that the American public is vitally opposed to a sweeping increase of fare for every one. On the other hand, there is no reason why any one should object to a higher fare for specialized service, when such specialized service does not interfere with the regular service given at the regular rate of fare. This specialized service cannot be given by street car, as one condition would be a high average rate of speed, and an express street car service could not be run on the same tracks as the regular street car service. The public would not permit the use of tracks to be put down in the street to serve only a selected portion of the community.

The history of present-day transportation in all American cities shows that while the community as a whole may fight to the last extremity for a low rate of fare, there are certain elements in the community that pay little attention to the cost of transportation as long as such transportation is speedy and comfortable. These are the elements that are at present using their private cars to go back and forth to their jobs, paying not only for the depreciation, upkeep and operation of these cars, but a substantial sum to house them in garages when they have reached their destination.

The modern bus with its high average rate of speed, which would be automatically made still higher by confining the number of passengers carried to the seating capacity of the bus and keeping the bus within reasonable limits of size, would exactly follow the needs of this class of citizenship and by the collection of fares approximating 25 cents per person, would be made a profitable transportation medium. There is hardly a city in the United States of 150,000 population that could not well support this supplementary service, and the demand for vehicles for this service would furnish to the motor bus manufacturing companies a more stable market than the attempt to force into mass transportation at standard rates of fare vehicles wholly impractical to operate from a profitable standpoint.

SEES ENLARGED FIELD FOR BUS

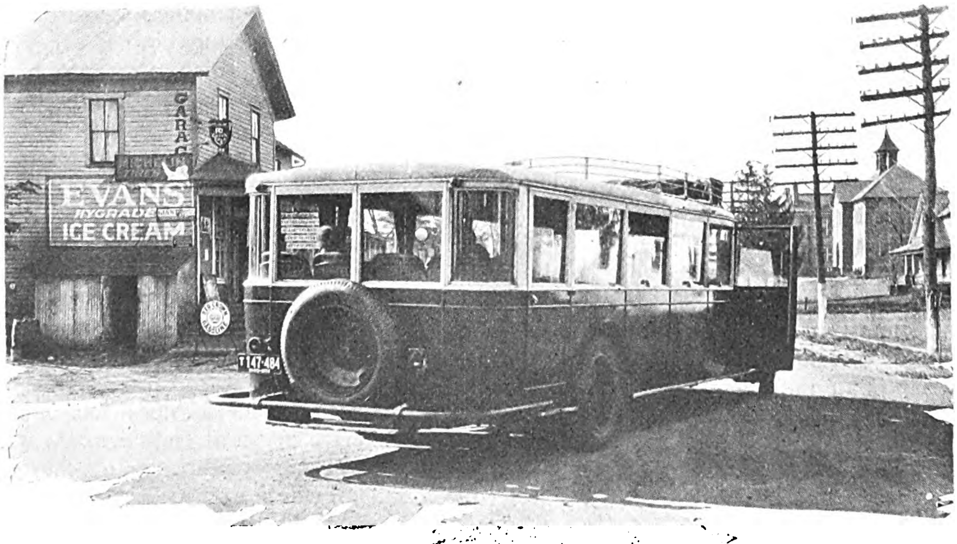
There may be a feeling that I am attempting to argue a restriction of the bus in urban transportation. I believe that by intelligently working out the best use of the bus, we enlarge its ultimate use. If the attempt had been made in Youngstown simply to parallel street railway transportation routes with bus routes, the investment in the buses would have been lost. Our company would have been crippled in its ability to buy either street cars or buses. However, as a result of the effort to co-ordinate bus service and street car service, using each class of service where it is best adapted, we are now operating nearly as many buses as we are operating street cars, and as a result, our street railway situation has been improved and our bus operation is self-sustaining. Surely this example is a vindication of the policy of co-ordination and not of substitution.

TABLE V—DETAILED ANALYSIS OF BUS OPERATING RESULTS IN YOUNGSTOWN, EXPRESSED IN CENTS PER BUS-MILE. EFFECT OF AGE OF EQUIPMENT ON OPERATING COST IS REFLECTED IN THE FIGURES

	Sept.-Dec. 1922	1923	1924	1925	Ten Months 1926
Equipment:					
Repairs—buildings	0.36	0.11	0.10	0.05	0.02
Superintendence	0.01	0.20	0.27	0.31	0.29
Repairs—chassis	1.51	1.52	2.32	2.63	3.86
Repairs—bodies	0.09	0.25	0.22	0.34	0.40
Tire repairs and renewals*	0.03	0.83	1.59	1.66	1.56
Accessories	0.31	0.29	0.29	0.39	0.00
Shop expenses	0.37	0.12	0.07	0.08	0.02
Total equipment	2.63	3.21	4.76	5.46	6.15
Conducting transportation:					
Superintendence	0.00	1.03	1.29	1.28	1.16
Chauffeurs' wages	6.05	6.34	6.94	6.73	6.83
Miscellaneous service expense	0.23	0.12	0.31	0.22	0.24
Dispatchers' and street men's wages†:					
Garage employees	1.65	1.57	2.19	2.29	1.80
Garage expenses	0.18	0.17	0.24	0.29	0.96
Gasoline	2.89	3.34	3.39	3.71	3.55
Lubrication	0.54	0.62	0.51	0.37	0.35
Miscellaneous transportation expense	0.28	0.28	0.32	0.45	0.59
Total conducting transportation	11.83	13.47	15.19	15.34	15.48
Traffic—advertising	0.00	0.01	0.00	0.00	0.00
General and miscellaneous:					
Salaries—general officers	0.00	0.29	0.27	0.24	0.19
Salaries—general officers' clerks	0.00	0.15	0.14	0.15	0.14
Office supplies and expenses	0.00	0.10	0.13	0.10	0.05
Miscellaneous general expenses	0.05	0.20	0.26	0.32	0.24
Liability insurance	1.33	1.92	2.23	1.72	2.41
Fire insurance	0.08	0.10	0.28	0.23	
Stationery and printing	0.02	0.01	0.02	0.02	0.03
Stores expense	0.00	0.00	0.00	0.00	0.04
Rent of equipment	0.00	0.18	0.01	0.09	0.00
Rent of garage	0.55	0.47	0.46	0.39	0.79
Total general and miscellaneous	2.03	3.42	3.80	3.26	3.89
Spent railway commissioner—salary and expense	0.00	0.00	0.26	0.28	0.29
Total operating expenses	16.49	20.11	24.01	24.34	25.81
Earnings	25.20	24.90	29.40	29.39	31.01
Operating, net	8.71	4.79	5.39	5.05	5.20
Taxes	0.65	0.46	0.97	0.86	0.66
Depreciation at 25 per cent per year	2.31	2.98	4.22	3.93	2.83
Net	5.75	1.35	0.20	0.26	1.71
Fixed charges—8 per cent investment	0.77	1.01	1.00	0.96	0.92
Surplus or deficit	4.98	0.34	0.80D	0.70D	0.79
Cost of service	20.22	24.56	30.20	30.09	30.22

* Guaranteed.
† Included in "Superintendence Conducting Transportation."

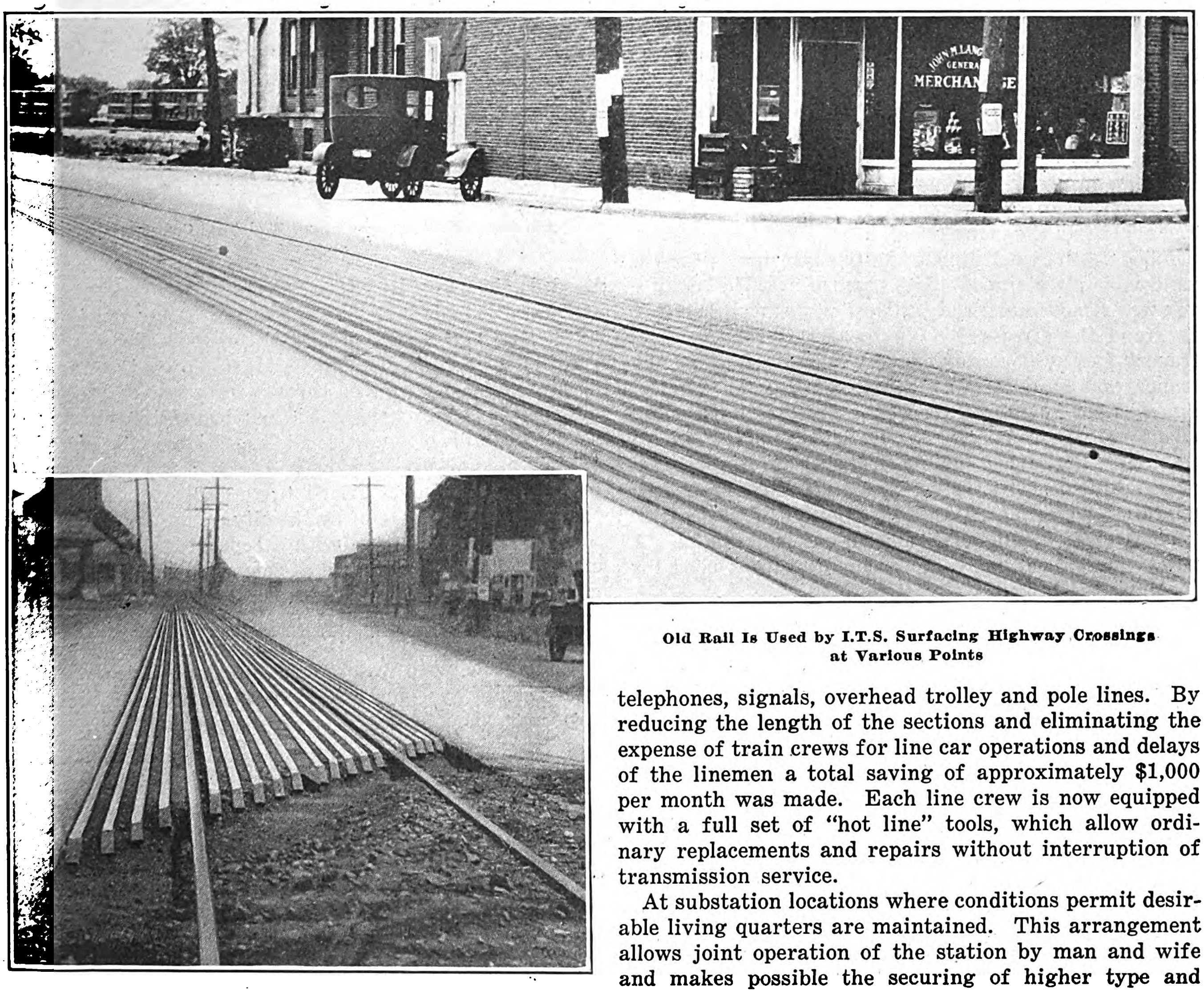
There is scarcely a city in the country where there have been sufficient street railway lines built in recent years to extend service into newer portions of the city. There is scarcely a city in the country where additional short bus routes cannot be operated to sections already served but not sufficiently served with street railway lines, and there is not a city in the country of more than 150,000 inhabitants that does not furnish a field for the specialized, superior bus transportation at a higher rate of fare.



Old Rails Used to Surface Highway Crossings

This and Other Track and Overhead Methods Have Recently Been Developed by the Illinois Traction System

WITH its more than 500 miles of track, the Illinois Traction System has necessarily had to make a study of the best method of track construction at highway crossings. The fact that its lines are crossed many times in Illinois by improved highways, on which there is a large amount of high-speed and slow-speed automobile traffic, has emphasized the need of both a satisfactory and durable form of laying pavement at these points. The methods followed are described in the brief filed by the company in connection with the Coffin Award contest.



Old Rail Is Used by I.T.S. Surfacing Highway Crossings at Various Points

After having tried numerous types and kinds of material for surfacing highway crossings the company decided that old rails would be the most economical foundation for construction of this kind because such paving would require less maintenance and have a longer life than other types. As shown, the old rails are laid parallel to the running rails, with all spaces between rails filled in except for the space required by the wheel flanges. The first crossings built in this way were so satisfactory, both from the standpoint of practicability, economy and satisfaction of the public, that 30 additional crossings of similar construction have been installed.

Some other interesting methods followed by the overhead maintenance department and the maintenance way department follow:

The overhead maintenance department effected an additional economy by increasing the number of maintenance sections from six to nine and equipping the maintenance crew with a gasoline motor car and tower car so they would not have to depend on the regular line cars for their work. The combined crews maintain everything in their territory, such as substations, telephones, signals, overhead trolley and pole lines. By reducing the length of the sections and eliminating the expense of train crews for line car operations and delays of the linemen a total saving of approximately $1,000 per month was made. Each line crew is now equipped with a full set of "hot line" tools, which allow ordinary replacements and repairs without interruption of transmission service.

At substation locations where conditions permit desirable living quarters are maintained. This arrangement allows joint operation of the station by man and wife and makes possible the securing of higher type and more reliable employees. The service obtained and the conditions surrounding stations operating in this manner prove the wisdom of this arrangement.

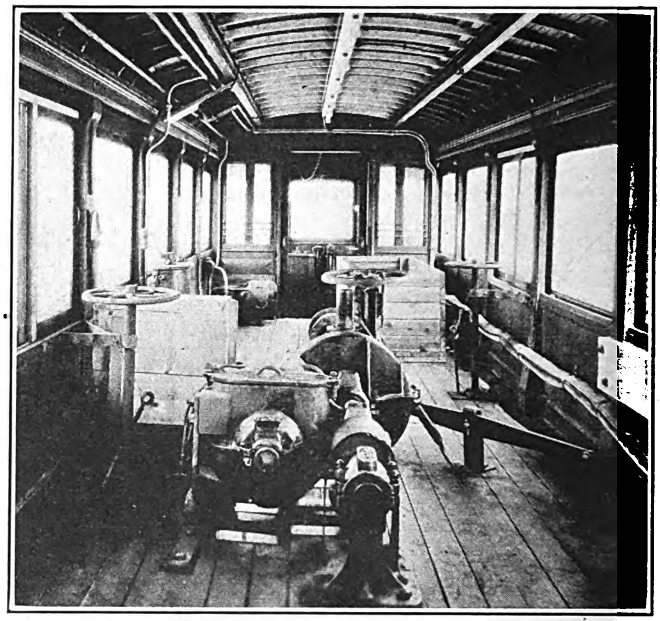
In the maintenance of way department both maintenance and construction methods and practices have been planned and executed with the idea in view of economy and permanence. Since 1909 creosoted ties have been used almost exclusively for main track. During that period 1,081,199 treated ties have been installed. This number corresponds to 90.9 per cent of the total in service. During the same period practically all original ties have been replaced.

The cumulative saving as a result of creosoting is apparent, since had it not been for the use of treated ties it would have been necessary to renew more than 120,000 ties during the past year at a cost of approximately $120,000. The actual cost of ties installed during this period was $45,600 or a saving of $74,400. Treated switch ties also have been used for several years, and during the past year maintenance and installations were less than 10 per cent of the total.

Thermit welding of track joints was tried experimentally two years ago, and this year was adopted as standard for track in paved streets. This applies both to maintenance of old track and the construction of new.

Combined Snow Scraper and Sweeper

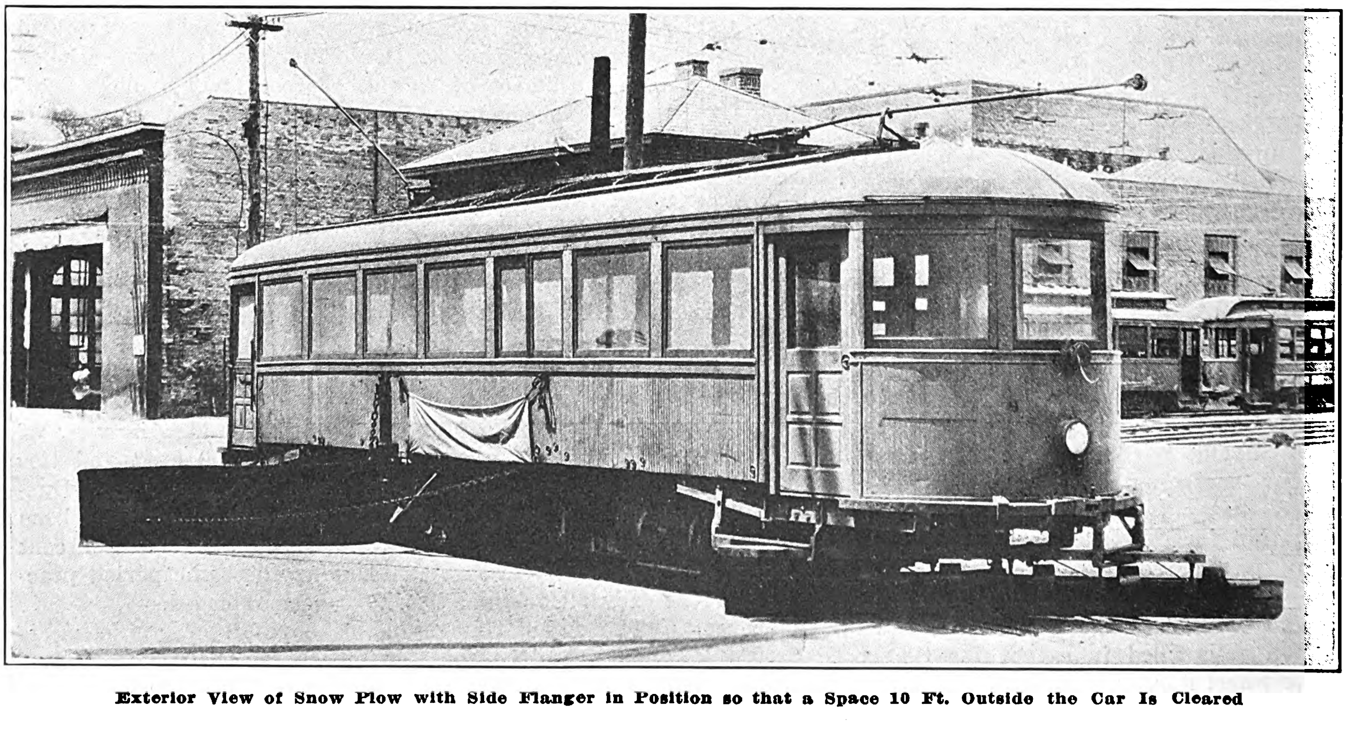
INCLUDED in the equipment destroyed in the Hall Street carhouse fire of the Grand Rapids Railway, Grand Rapids, Mich., in July, 1924, were two sweepers and a snow plow. The company had two passenger cars which, due to extremely heavy weight, small vestibules and bulky proportions, were objectionable for regular service. It was decided to remodel these into combination snow plows and sweepers to replace similar equipment destroyed. These cars, originally built by the Cincinnati Car Company, were 44 ft. over all and 32 ft. over body. In remodeling these the interior of the car was completely stripped of its furnishings, the monitor deck was removed and the car body was strengthened to withstand the stresses set up by the operation of the scrapers and sweeper broom. An adjustable swinging scraper was purchased, together with a broom and frame. Root spring scrapers were placed at the ends and in addition a flanger was installed on each side of the car. This latter can be operated through chains from the inside of the car. The broom and propelling apparatus were placed midway between the trucks, which is quite a unique feature in sweeper design. A railway motor, old but in good condition, was used for propelling the broom.



All Electrical Equipment, such as Resistors, Compressors, etc., Is Installed Inside the Car

The resistance units, air compressor, air reservoirs, etc., which originally were underneath the car, were removed and installed inside the car. Bins were also constructed for sand and salt, so that when out on the line the crew could salt switches or sand the rails where needed. The car is driven by four GE-70 motors and is arranged for double-end operation. An apron is used at the end of the broom to keep the snow down so that it will fall close enough to be taken up by the flanger, as otherwise it would be thrown far away and against windows and automobiles. When tested the plow performed admirably under all conditions. Snow was thrown outside by the plow and broom and was caught by the scraper and carried to the side of the street, there to be taken care of by the city.

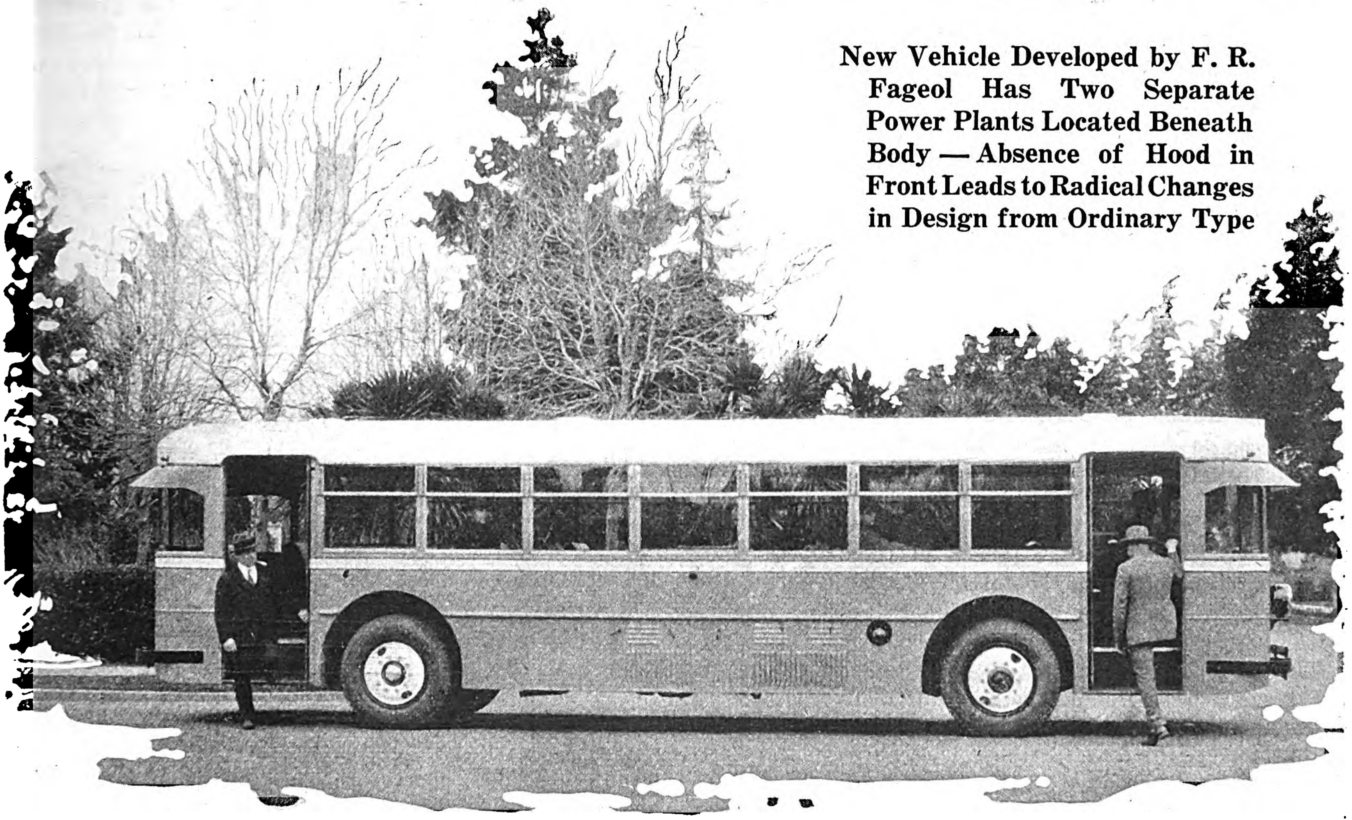
By driving the broom with a separate motor greater efficiency has been obtained as compared with equipment previously used in which the broom was driven by the same motor that propelled the car. The use of this equipment has decreased the number of men in the snow-fighting crew, with resultant lower operating cost. The total amount expended in the reconstruction of this car to provide snow plow and sweeper was $4,337.



Exterior View of Snow Plow with Side Flanger in Position so that a Space 10 Ft. Outside the Car Is Cleared

Twin-Drive Bus Makes Its Appearance

New Vehicle Developed by F. R. Fageol Has Two Separate Power Plants Located Beneath Body — Absence of Hood in Front Leads to Radical Changes in Design from Ordinary Type



DISTINCTLY different from anything that has been placed on the market heretofore is the new Twin Coach designed and built by Frank R. Fageol, Oakland, Cal. The bus, which is illustrated herewith, has two four-cylinder engines, one on each side of the chassis, which drive the two rear wheels through separate worms. According to the builder, the aim is to reduce the passenger-mile cost of transportation.

The new bus, which is built low to the ground, has an over-all height of only 8 ft. 4 in. The over-all length is 31 ft. 6 in. and the width 94 in. The general appearance is somewhat similar to that of the Birney street car, although there has been worked into the design a streamline effect that gives it a long, low, rakish look quite in conformity with present-day automobile tendencies. The wheelbase is 203 in., which gives a turning radius of 34 ft. The gross weight fully equipped is 13,000 lb. It is stated that the vehicle is capable of speeds up to 55 m.p.h.

In its construction the chassis and frame are more closely dependent on each other than in buses of the usual types. The chassis is a frame of light construction, channels running from front bumper to rear bumper being fastened together to form an H-shaped structure. On this is mounted the steel body frame, so built up that the two side structures of the body, together with the chassis channels, form individual trusses tied together by means of the chassis cross members and the sheet steel center panel of the roof. This arrangement allows for the flexing of the chassis along with the body.

On either side, mounted in a recess between the chassis channel and the body side sill, is a four-cylinder engine, with 4-in. bore and 5½-in. stroke. Directly in front of each engine is mounted a radiator with header tank. Each of these power plants is incased in a sheet steel compartment. Power from each engine is carried through an individual clutch, transmission and short propeller shaft to an inverted worm drive mounted adjacent to the brake drum and wheel. There are thus two individual and self-contained driving units. The inverted worm housings are joined by a 3-in. steel tube which acts as a stiffening member. Each worm housing has a spring seat mounted close to the brake drum to minimize the bending action on the tubular tie.

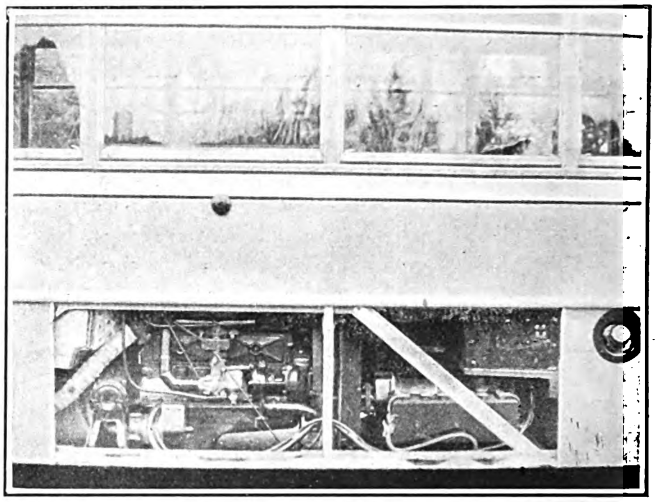
The Interior of the Twin Drive Bus Is Not Unlike That of Other Types, Except Side Seats Are Placed Over the Motors

Because of the side location of the power plants it was found possible to incorporate many innovations in the design. On the forward end of each crankshaft is mounted a 600-watt generator and a 9-cu.ft. capacity air compressor. Together with the 6-volt, 300-amp.-hr. storage battery, these are carried on a shelf in front of the radiator. The 50-gal. gasoline tank is carried between the main frame channel members at the center of the chassis. Feed from the tank to the carburetor is through two Stewart vacuum tanks mounted in the side panels of the body just in front of the radiators. The filling pipe for the gasoline tank is on the left-hand side.

Air is carried through louvers on each side of the body through the radiator, thence it is driven by a fan down past the engine and out under the bus. To make the engine accessible a side plate may be removed as shown in one of the illustrations. The engines are built in pairs, right and left, so that the valve mechanisms and the carburetors are placed on the outside where they are available for easy adjustment and maintenance.

Steering is done in much the same manner as it is on the ordinary type of bus. The steering wheel, however, is mounted ahead of the front wheels, so that the drag link is to the rear rather than to the front. The 203-in. wheelbase and the length of the vehicle place the driver's position approximately 4 ft. ahead of the wheels. This position does not materially affect the "feel" of the driving.

The driver's position is to the left, directly back of the large front window, being similar to that in an electric street car. The control is practically identical with the type used in the ordinary single-motor bus. A single pedal actuates both clutches and a gear-shift lever both transmissions. Two accelerator pedals are mounted side by side. The two form a footrest and are used to synchronize the two engines. By rocking the foot the operator can feed additional fuel to that engine which does not appear to be pulling its share of the load. Two floorboard type starter buttons are located to the left of the driver's seat.



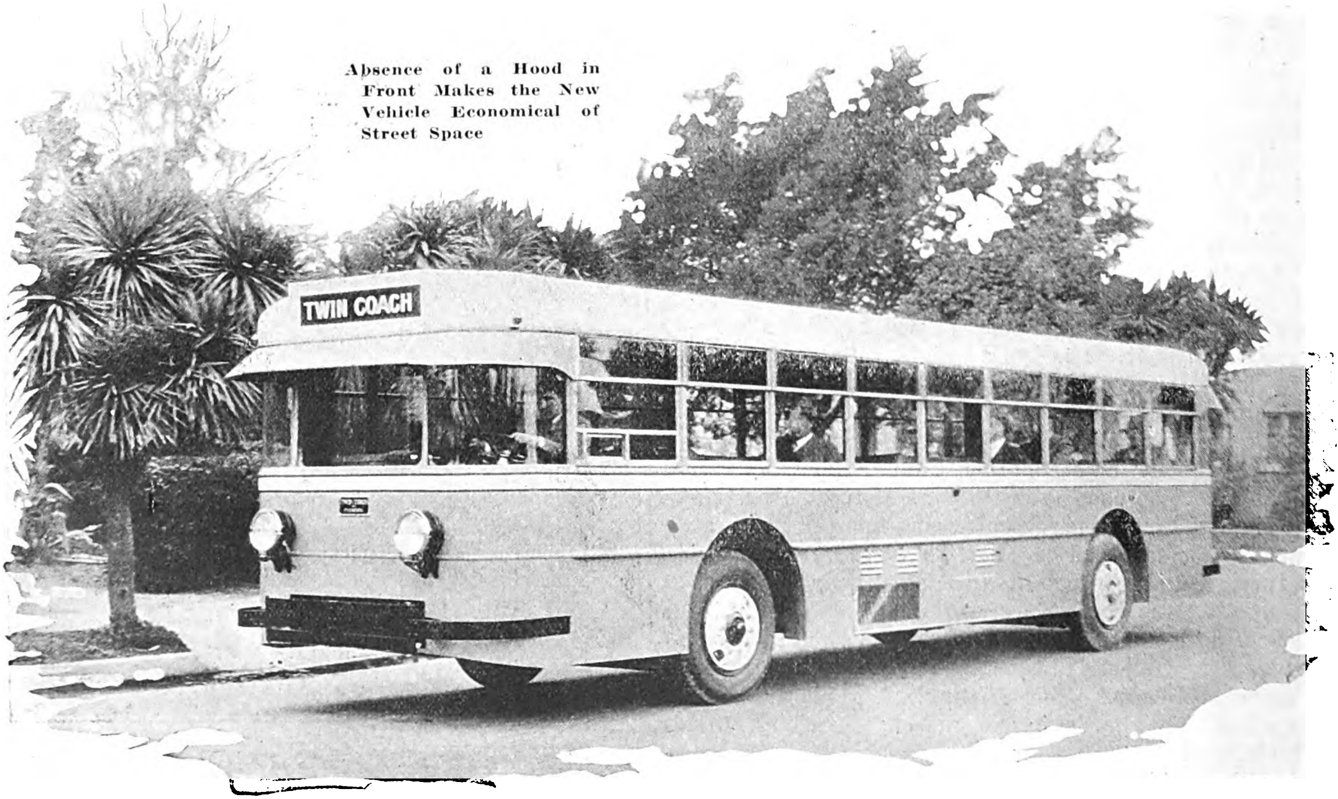
A Removable Panel on Each Side Gives Easy Access to the Driving Mechanism

All four spring mountings are identical, 60-in. x 3½-in. springs being used all around. Tires are single pneumatic on all four wheels. The mounting of the brake mechanism is compact and is built integral with the brake drum mounting.

Interior trim is steel with side paneling of mahogany-finished Haskelite. The floor is exceptionally light in weight, being of ⅜-in. plywood laid in sections so that it can be removed readily for inspection of the driving mechanism. The roof is of the arch type, extended slightly at the front end to form a hood for the illuminated sign. There is a slight break in the middle, increasing the height about 1 in. directly over the aisle.

The lighting is indirect. The ten 21-cp. lamps are placed at the back of a molding located above the windows just below the advertising rack. Reflectors back of the lamps throw the light up against the advertising racks and onto the white enameled ceiling.

Folding doors are located at front and rear. They



Absence of a Hood in Front Makes the New Vehicle Economical of Street Space are air operated. The floor level is 25 in. above the street. One intermediate step is used, 11 in. above the ground, so that the rise from the step to the floor of the bus is 14 in. Windows are framed with brass sash and are arranged to lift.

The corners of the vehicle are rounded and the glass in the corner windows is curved to conform to the body lines. Both ends of the body, which are identical in shape, are fitted with metal visors. The front has two headlights and there is a bumper at each end. Directly behind each bumper is a recess for a spare tire.

Seats are provided for 43 passengers, and there is room for 30 standees. Above each sheet-steel compartment housing for the engines is a side seat accommodating two passengers. Side seats are also placed over the four wheel housings, which cut up the body. Other seats in the body face forward. A lounge-type seat which accommodates six passengers is carried across the rear of the vehicle.

The Readers' Forum

Gross Net Tax Making Progress

AMERICAN ELECTRIC RAILWAY ASSOCIATION

NEW YORK, Feb. 15, 1927.

To the Editor:

I read with great interest your editorial in the ELECTRIC RAILWAY JOURNAL of Feb. 5, 1927, regarding taxation. In this you brought together the views of John J. Merrill of the New York Tax Commission and Prof. Edwin R. A. Seligman of Columbia University. It does not often happen that the theorist and the practical man are in such complete accord, but in this case you have it, and by bringing these views together you have made out a very strong case for tax revision in this state.

I feel sure that much will be accomplished throughout the various states, if the industry realizes that tax reform is no longer a mere theoretical matter but is a subject that can be approached with real hope of success. Within the last few days gross-net tax bills have been presented by the railroads in two of the New England States, and a third bill of the same nature will probably be presented in Wisconsin, as a result of the report of the interim committee on administration and taxation, in which the committee states:

> That there should be a closer approach to uniformity in the taxation of public utilities is acknowledged by everybody, but the hitch comes over whether they should be taxed at the local rate or at the average state rate. To us it seems that there are valid objections to both of these bases. In fact, much is to be said against taxing utilities on their property at all. What is the true market value of a public utility is very difficult to determine and it is still harder to allocate this total value fairly to each of the several taxing districts in which its property is located. Undoubtedly it is simpler to tax utilities upon their earnings and also more equitable. Clearly, however, it will not do to base the tax solely upon net earnings, because this would often result in no tax at all from large companies. The best suggestion made is that public utilities should be taxed upon what is known as "gross-net earnings" basis, such as was proposed by a special legislative committee in New York some years ago. Under this plan both the gross and the net earnings are taken into consideration in determining the tax, and no company escapes entirely and the companies with the largest net earnings also pay the highest rates. That this method of taxing public utilities deserves serious consideration, we are convinced; but we have not been able to work out the details of this plan or to make the necessary calculations to see where it would lead. We, consequently, refrain from recommending any change in the taxation of public utilities.

An editorial such as yours cannot fail to help our industry.

LESLIE VICKERS,
Economist.

Approves Use of "Popular" Transportation

CITY OF DETROIT
Department of Street Railways

Feb. 18, 1927.

To the Editor:

Allow me to compliment you upon the editorial appearing in the Feb. 12 issue of the ELECTRIC RAILWAY JOURNAL commenting upon the term so commonly used to designate that type of transportation which moves the multitudes.

Your suggestion to substitute the word "popular" for "mass" when referring to this type of transportation is indeed very appropriate because the mention of the word "mass" as applied to transportation generally carries with it a picture of a vast throng or jam of human beings, which certainly does not tend to popularize that form of transportation in the minds of the traveling public.

Another misnomer which is quite commonly used, at least in this part of the country, is the term "platform men" used in reference to motormen and conductors. It is the writer's opinion that "trainmen" is a more fitting term to use in designating that type of employment.

D. A. SMITH,
Acting General Manager.

It Hits the Nail on the Head

EAST ST. LOUIS LIGHT & POWER COMPANY

Feb. 15, 1927.

To the Editor:

I notice the suggestion regarding use of the term "popular transportation" instead of "mass transportation" in the leading editorial of the Feb. 12 issue of ELECTRIC RAILWAY JOURNAL, and I think it hits the nail exactly on the head.

I like, too, your thought for the future on "awakening the public to a demand for something better in transportation at an appropriate price."

JOHN H. MITCHELL,
General Manager.

Old Register Cards Used Again

FOR several years the Union Street Railway, New Bedford, Mass., has used a standard mimeograph machine to print letters, circulars, time-tables, notices, etc. Recently, however, this machine has been used extensively for the printing of forms on the backs of discarded register cards, meter cards, etc. The cards are made of heavy manila cardboard and after serving their purpose as accounting cards were formerly sold for old paper or used as note cards. As the backs were usually clean, they made excellent record cards when run through the mimeograph machine and stenciled into form cards. Among the uses found for these cards were inspector's traffic checking forms, tire change forms, mileage reports and several special checking reports. The cost of making these cards is nominal as the cost of the material is practically nil and they can be printed by the office clerks at times when they are not busily engaged with office work.

Maintenance Notes

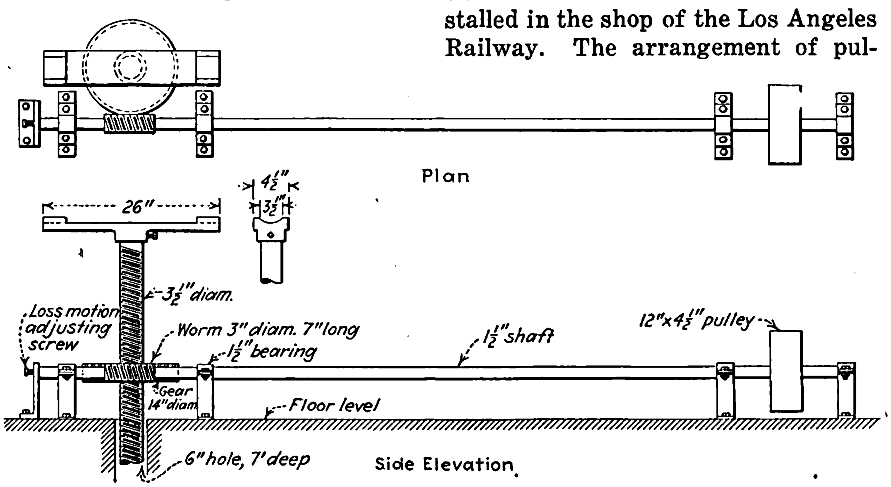
Motor-Operated Wheel Jack

REMOVING a pair of wheels from a truck or installing a pair of wheels in a truck was always considered a slow and tedious process in the shop of the Lynchburg Traction & Light Company, Lynchburg, Va., until Master Mechanic Cochran designed and constructed a motor-operated jack for this work. The principal parts of this equipment are a line shaft, worm, pulley, lifting screw, gear, axle cradle, bearings and adjusting screw.

A 1½-in. diameter steel shaft 10 ft. long is designed with a worm of 3 in. diameter and 7 in. long, located about 12 in. from the end of the shaft.

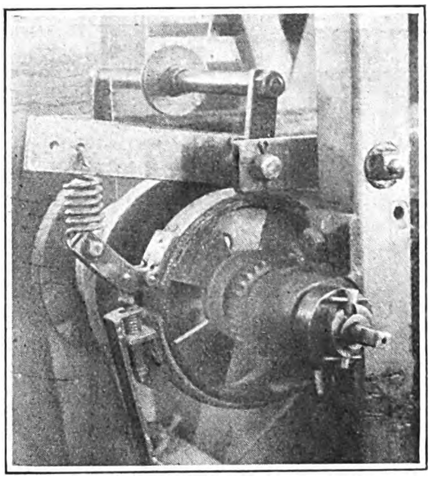
About 10 in. from the end of the shaft opposite the worm is a 12-in. x 4½-in. iron pulley keyed and fastened rigidly to the shaft. The assembled shaft is mounted on four bearings fastened to the floor by lag screws, and sufficient clearance is allowed between the pulley and worm and the floor. A ¾-in. adjusting screw, mounted on the worm end of the shaft, provides a means for taking up lost motion between the worm and gear teeth. A 14-in. worm gear wheel in mesh with the worm drives a 3½-in. diameter lifting screw passing through its center. A 6-in. hole in the pit floor 7 ft. deep allows free and unobstructed upward and downward movement of the lifting screw. A heavy malleable-iron grooved axle cradle mounted on top of the lifting screw provides a means for balancing of the wheels during the handling process. The jack is belt-driven by a General Electric 2-hp., three-phase, 230-volt, 1,800-r.p.m., 60-cycle motor, equipped with a 4-in. paper pulley. The lineshaft, bearings, worm, and in fact all parts of the jack adjacent to the floor, are boxed in with 1-in. oak boards to prevent injury to the workmen.

This motor-operated wheel jack has resulted in increased production and decreased effort due to the rapidity with which it is possible to change wheels.



Motor-Operated Jack for Installation or Removal of Wheels from Trucks

Brake Gives Uniform Band Wire Tension



Close-Up View of the Brake, Which Is of the Automobile External Contracting Type. It Is Held Closed by Weights on the Lever, but Is Operated as the Tension on the Wire Turns on the Pulley Shown Just Above the Brake

PROPER tension is maintained in the banding wire as it is fed to the machine by an apparatus which automatically controls the release of wire from the spool and also holds the tension as the band is laid on the armature. The device is installed in the shop of the Los Angeles Railway. The arrangement of pulleys, levers and brakes is in a wood framework approximately 2 ft. square by 7 ft. in height. It is located about 4 ft. in front of the banding lathe.

From the accompanying drawing it will be seen that the wire leaves the supply spool, which is carried on a shaft at the rear of the framework, to the feed pulley at the front of the apparatus. The path of the wire is such as to engage pulleys which are so mounted as to have an effect on releasing the brake mechanism and allowing the supply spool to revolve.

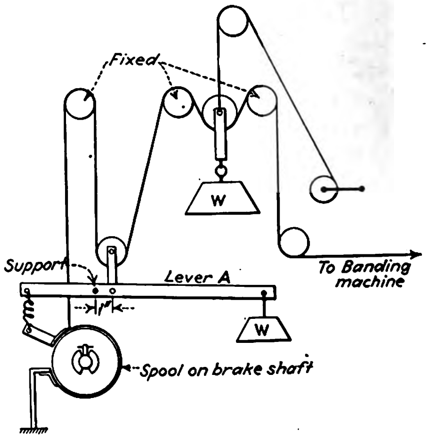
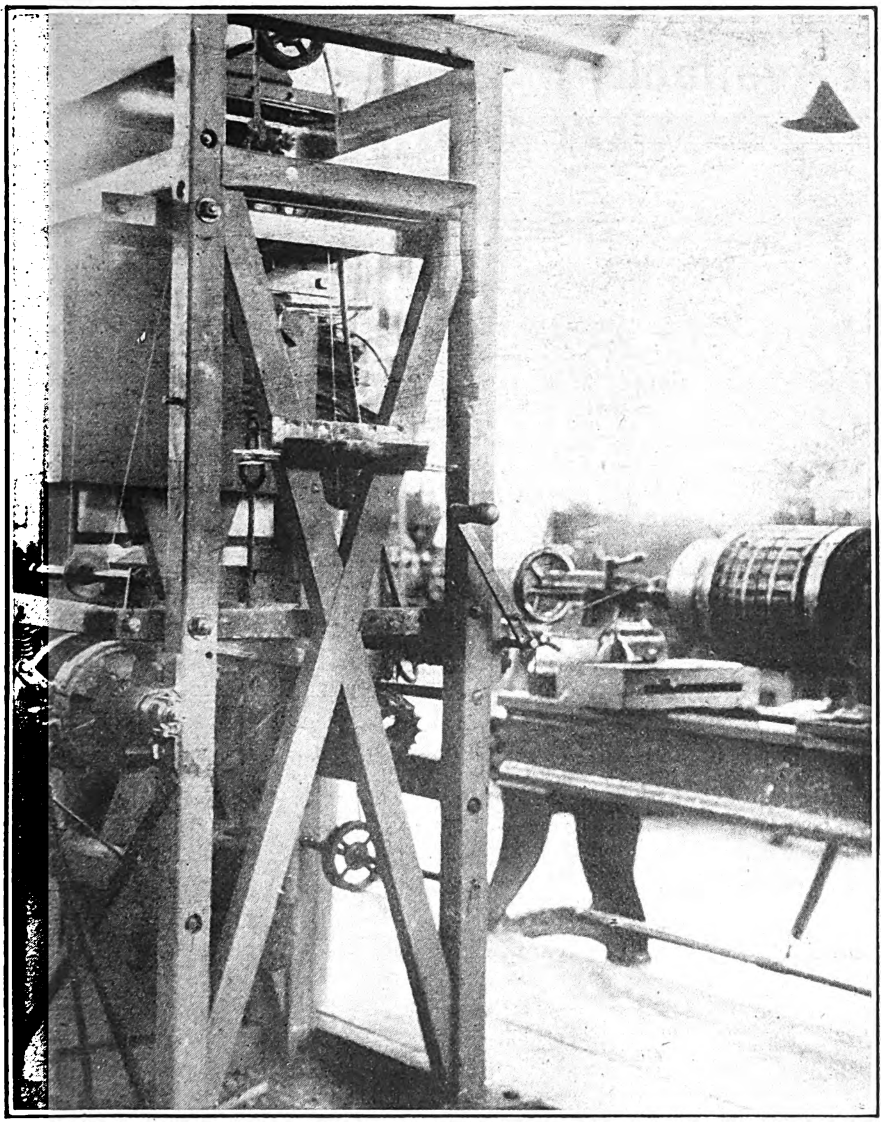


Diagram of Apparatus Which Maintains Proper Tension in Banding Wire and at the Same Time Holds That Tension When the Machine Is Stationary

The wire carried upward over a pulley, then down to a pulley mounted on a shaft, which in turn is fastened close to the fulcrum of a lever arm. This same arm extended carries the tension weight at the extreme end and at its other end operates the clamp which closes or opens the band brake on the supply spool. From this pulley the wire is carried to three pulleys at the top of the machine, thence down to the feed pul-



Banding Wire Is Maintained at the Proper Tension in the Los Angeles Railway Shop by an Apparatus Which Includes an Automatically Operated Escapement Brake and a Device for Maintaining the Tension in the Wire When the Armature Is Not Rotating. It Is Placed Approximately 4 Ft. in Front of the Banding Lathe

ley, which is a little below the level of the work in the adjoining banding machine. Of the three pulleys at the top of the machine two are stationary. The center one with weight attached may be lowered by a winch and rope. When lowered, the weight is hung on the wire to maintain the tension which ordinarily is set up by the rotation of the banding machine. Thus, when the machine is stopped for finishing off the banding, the tension is maintained until the wire is fastened. The movable pulley and suspended weight take care of this.

The frame of the apparatus is built up of 2½x2½-in. wooden members securely braced and anchored to the floor. This takes care of the pull of the banding wire, which for No. 16 gage steel wire, as used on the Westinghouse No. 306 armatures, amounts to 400 lb. For the No. 24 wire used on compressor armatures a tension of only 40 lb. is used. This pressure is measured by means of a spring balance connected in the line at the time work is started on an armature. By adjusting the weight applied to lever *A* the tension may be controlled.

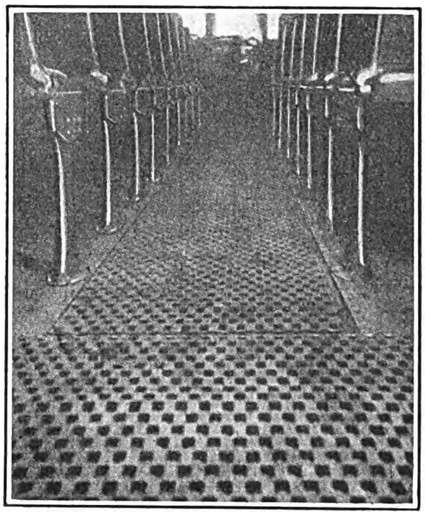
A feature of the apparatus is the ease with which spools of wire may be changed. The flange of the spool has been drilled to take a long set screw which fastens the spool to the shaft. The shaft in turn is fastened by means of a removable pin to the brake drum. By loosening the set screw and disengaging the shaft pin it is possible to slip the shaft out endways and change the supply spool without disturbing the set-up of the machine. By placing a crank handle on the end of the shaft, it is possible to back off—that is, rewind on the supply spool wire which already has been applied to the armature.

The banding lathe used is a rebuilt engine lathe driven by a small electric motor through a worm. A pedal operated cone clutch controls the drive between the motor and the lathe.

Equipment repairs made in time
Will save "pull-ins" from the line.

Linoleum and Flexible Rubber Floor Covering

BELIEVING that a neat, clean and attractive floor covering will have a tendency to attract the public, the Wilkes-Barre Railway, Wilkes-Barre, Pa., has equipped one of its car floors with linoleum and flexible rubber mats. Underneath the cross-seats the floor is covered with a design to represent tile work. The edges of this are bound with a 1-in. brass strip neatly screwed to the floor. Though the center of the car and in front of the longitudinal seats the floor is covered with a flexible hard rubber mat made of ⅝-in. x 2-in. pieces of hard rubber spaced ½ in. apart and bound by steel strips. The linoleum and mat are on the same level. The mats have a clean surface at all times since all dirt falls through to the floor.



Designs of Linoleum and Flexible Rubber Mats Harmonize

This floor covering gives a very impressive appearance, and since the mats can be rolled up easily to permit sweeping this appearance can be maintained.

The linoleum, with its pleasing tile effect, and the brass binding strip create a pleasing interior effect.

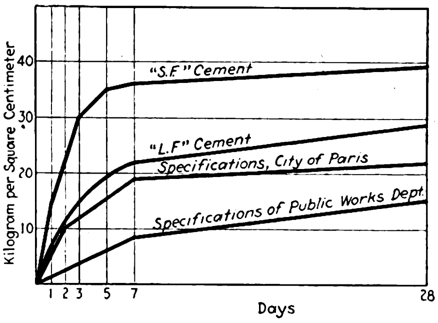
New Equipment Available

Time Saved by Quick-Setting Cement

CEMENT having high crushing strength and quick-setting qualities with a chemical composition which does not differ materially from ordinary cement is being made by the Société Coloniale des Chaux & Cements Portland of Marseilles, France, under the name "Super-Flambeau." It is handled in the same way as ordinary Portland cement. Its quick-setting feature does not hamper the mixing and pouring, which can be done at the same speed as when handling ordinary cement.

Advantages claimed for this cement on account of its strength and quick setting are: (1) Economy in wood plank forms, because the forms can be removed two or three days after the pouring; (2) economy in time, because the reinforced concrete object can be turned over as finished after five or six days; (3) general economy, because the sections of reinforced concrete girders, pillars, blocks, foundations, etc., can be reduced.

As a basis for calculation a strength of 100 kg. per square centimeter (1,420 lb. per square inch) on compression may be assumed. The strengths and setting time characteristics of S. F. cement are shown by accompanying curves.



Tensile Tests of Plastic Mortar Using a 1: 3 Mixture of Super-Flambeau Cement

The chemical analysis of this cement is as follows:

	Per Cent
Soluble silica	22.10
Sand	0.20
Aluminum	6.70
Iron oxide	2.75
Chalk	62.00
Magnesia	1.62
Sulphuric anhydride	0.59
Ashes	3.65
Undetermined elements	0.39
	100.00

S. F. cement shows the following sieve test:

	Per Cent
Retained on 324-mesh sieve	0.0
Retained on 900-mesh sieve	0.1
Retained on 4,900-mesh sieve	0.9
Finest powder	99.0
	100.0

Mixed with 25.5 per cent of its weight of water at 15 deg. C., the cement will begin setting after 2½ hours, and will have set completely after 4½ hours, while exposed to humid air. Immersed in water, the setting will begin after three hours, and will have been completed after six hours.

Tensile and compression strengths of samples of S. F. cement, at various ages, are given in the two accompanying tabulations.

COMPARISON TESTS IN KILOGRAMS PER SQUARE CENTIMETER

Mixture	Number of Days One	Two	Three	Five	Seven	28
Cement—200 kg. Gravel—800 liters. Sand—400 liters. Water—5.7 per cent	66	131	165	204	215	248
	65	127	161	195	201	263
Average	65.5	129	163	200	208	255
Mixture Cement—250 kg. Gravel—800 liters. Sand—400 liters. Water—6.5 per cent.	72	152	190	245	281	325
	72	158	193	251	282	336
Average	72	155	191	248	281	330
Mixture Cement—300 kg. Gravel—800 liters. Sand—400 liters. Water—7.2 per cent.	60	167	191	246	299	361
	60	155	194	244	297	344
Average	60	161	192	244	298	352

ULTIMATE TENSILE STRENGTH IN KILOGRAMS PER SQUARE CENTIMETER

	Number of Days											
	One	Two	Three	Five	Seven	28	One	Two	Three	Five	Seven	28
Pure cement with 25 per cent water	33.6	35.1	39.5	53.0	54.1	....	243	311	383	494	550	...
	32.4	37.4	40.7	51.8	54.0	....	277	362	469	469	554	...
	24.1	32.6	43.1	50.8	59.2	....	238	298	358	473	575	...
	29.8	38.2	49.3	54.0	53.0	....	247	366	507	511	469	...
	30.1	38.1	45.5	52.6	56.3	....	273	298	469	473	503	...
	27.9	38.4	44.3	50.1	59.8	....	251	332	383	503	567	...
Average	29.7	36.6	43.4	52.0	56.1	....	255	328	428	487	536	...
Maximum	31.5	38.0	45.1	52.8	57.4	....	262	343	457	495	562	...
Mixture 1 cement and 3 sand with 10.6 per cent water.	11.9	21.4	27.4	34.0	36.1	37.4	68	149	175	273	256	392
	12.0	21.2	31.2	31.9	31.7	34.5	64	145	192	256	277	358
	12.2	24.9	36.1	35.1	35.0	35.2	64	154	196	239	328	328
	12.0	20.4	26.4	32.6	39.1	35.4	60	158	200	268	281	358
	12.1	19.9	29.1	33.0	29.8	35.1	60	162	170	256	290	337
	11.9	23.2	29.0	34.1	32.6	38.2	64	149	213	260	277	324
Average	12.0	21.7	29.9	33.5	34.1	36.0	63	153	191	259	287	349
Maximum	12.1	22.4	31.4	34.1	35.7	36.6	65	156	200	264	294	361

The "Elimination of Waste Campaign" activity
Refers especially to the "Short Strand Shoddy" variety.

Improved Wiring for Switch Groups

IMPROVED design of main wiring for switch groups types 251 and 264 has been announced by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Use is made of the type 480 main wiring, eliminating many wiring troubles. New design of terminal studs permits assembling the switch units in place independent of the connection straps. Lock washers are used to keep the studs tight. In case any of the connection straps become loose in service the switch units are not affected. The connection straps can be removed without disturbing the switch units.

A cup washer replaces the two upper molded vulcabeston washers of the type 264 main wiring and the molded flat washer and thin cup washer, originally used on the type 480. It also replaces the fishpaper guard on top of the base plate. This new washer provides greater creepage distances and improved insulation. Shrinkage of the new micarta duck washers is much less than that of the vulcabeston. Where the new type of main wiring is used any shrinkage which may occur does not cause the connection on the straps to become loosened. This feature eliminates burning which occurs with the older design due to shrinkage and loosening of the straps.

New bent connection straps are used to replace the flat straps and copper spacing collars used with the old design. This eliminates the spacing collars, thereby reducing the number of contact surfaces and consequently the chance of burning if the straps become loosened.

Association News & Discussions

Co-ordination and Safety Discussed by Kentuckians

WHAT has been generally characterized by members as the most successful and interesting meeting in the records of the Kentucky Public Utilities Association was the two-day convention held at the Brown Hotel, Louisville, on Feb. 18 and 19, it being the tenth annual gathering of the organization. Business sessions were held on Friday afternoon and Saturday morning with the annual banquet on Friday night, in the Crystal Ballroom of the hotel, followed by a dance. The attendance was 278, while 389 persons were seated at the banquet.

From the standpoint of electric railway operators there were two talks of principal interest. One was by W. H. Sawyer, president of the American Electric Railway Association, who spoke on "City and Interurban Transportation." An abstract of Mr. Sawyer's address appears on this page.

Neil W. Funk, director of safety Louisville Railway, in discussing safety work, held that there was a time when the employer's first inquiry, following an accident, regardless of bloodshed and suffering, was "What's it going to cost us?" Everything else was secondary, instead of life and suffering being the first consideration. There were dangerous machines, poor lighting, and criminal negligence, no safeguards. Workers were so many foreigners, or what not. Mr. Funk held that no chances should be taken with the humblest of employees even to the losing of a little finger. The sentimental side of employment was stressed, and the argument made that even though the work did not save the company a cent it increased morale, affection of employees for employer, improved relations between capital and labor, and what was gained was well worth while, as it results in an organization. It results in a sense of loyalty where they have the inspiration given them by the company really caring for their welfare. He held that the safety movement was the greatest and grandest gesture that humanity has yet made.

President T. B. Wilson, in his annual address, touched on the electric railway and bus situation. He said that no one in the electric railway industry holds any doubts as to the future of that class of transportation in large cities. The electric car has demonstrated thoroughly that it will remain the backbone of mass transportation. The small city line still is a problem.

Harry Reid, president of the National Electric Power Company, New York, told of incidents in the growth of power and light utilities in Kentucky during the last twenty years. Mr. Reid, a former president of the association, entered the utilities field at Versailles, Ky., twenty years ago.

Officers for the coming year, as named at the conclusion of the program, were as follows:

President, W. R. Power, Ashland, Ky., general manager Ohio Valley Electric Railway, Huntington, W. Va.

First vice-president, Samuel Riddle, Louisville.

Second vice-president, L. B. Herrington, Louisville.

Treasurer, A. A. Tuttle, Louisville.

Secretary, E. F. Kelley, Louisville.

The new executive committee is composed of the officers, along with T. B. Wilson, Louisville, retiring president; J. P. Barnes, Louisville; W. H. Harton, Covington; J. P. Pope, Lexington; P. S. Pogue, Louisville; H. D. Fitch, Bowling Green; W. S. Cramer, Lexington, and H. J. Cochrane, Maysville.

Transportation a Community Problem*

By W. H. Sawyer

President American Electric Railway Association

PUBLIC utilities as a group have much in common, and especially are their aims and desires to serve their communities distinctly in common. There are, however, phases of the electric railway problem which appear to me more complex than those of any other industry.

The light and power and gas utilities meet their customers perhaps once a month. We meet ours twice a day, and every time we ask them for money. The major item of our expense is for employees who meet the public as our representatives. This item is comparatively an inappreciable portion of the expense of the electric light and power or gas company. We want our conductors and motormen to be courteous and helpful, and taking into account the conditions encountered, I believe we are far more than fairly successful, but I just want you to realize that with 30 per cent of our total operating expenses paid to motormen and conductors we have a real problem, and one that is seldom fully appreciated.

You electric and gas men have your peak loads, and satisfactorily to meet peak demand conditions adds to your responsibility, but only to a comparatively minor extent. It is an economic impossibility with the street car or with the bus to give every customer a seat during the rush hours. Nor is it always practicable even approximately to meet this desirable condition. If we were to give a seat to every passenger during the rush hour a 15-cent fare would not give as much net revenue as would a 10-cent fare if we carried during the rush hour standees up to, but not to exceed, the number of seated passengers. To obviate one of the most common complaints, therefore, is economically impracticable. Please keep in mind that I am referring to city transportation with either buses or street cars used to take care of all the transportation requirements. The public generally does not appreciate that with bus operation in the street car field the bus has to take care of only a portion of the total traffic. I have in mind particularly a more western city where bus service is given, paralleling and competing with the street car service in the cream of the traffic. The bus in this instance may give a seat for every passenger and charge but 10 cents, but it does not take care of all the traffic which may present itself. All it purports to do is to take care of traffic up to the seating capacity. When the blizzards and the rains come and the automobile user seeks public transportation it is the street car that must take care of his needs. Therefore, do not let yourself be misled into making an unfair comparison between the vehicle or system which takes cream traffic or limited traffic only and is not prepared at all times to take emergency and abnormal traffic.

Plenty of Advice in Operating Street Cars

There is one other peculiarity about the street car business. Our customers become so familiar with our cars and our schedules and are brought into contact with us so intimately and so often that they really think they know all about our business, although we who have spent a lifetime in it realize that we have yet much to learn.

There is one other feature with which you other public utilities do not have to contend. You furnish light, power or gas to all classes and conditions of people, rich and poor, honest and dishonest, white and black, but when the electric wires or gas pipes enter one's home those wires or pipes are considered personal and individual. They furnish service for that one family or that one industry. On the street car the bitterest enemies may of necessity sit or stand shoulder to shoulder. There is also that eternal human desire to take the first car though it be crowded and a comparatively empty car follows closely.

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*Abstract of an address before the Kentucky Association of Public Utilities, Louisville, Feb. 18, 1927.

I have served as an executive of electric light and power and gas companies. The same executive in charge of a joint light and power and railway property will spend of necessity three-fourths of his time on his railway problems. This is also a fair comparison to make for the gas company. You other utilities should not judge us solely by financial results. Our public relations problem, our intimate contact with the public, the conditions under which we must do business with our customers are more personal and individual than yours.

A year ago I was down in Australia, called there to make a report on a government-owned utility. I had every opportunity to study public ownership from the inside. In Australia there is, broadly speaking, no graft or corruption in connection with the operation of the public utilities. The employees of the publicly owned public utilities there are not subject to political changes. They are not selected for their political leanings.

Nevertheless, I came back from Australia with the most definite conviction that those theorists advocating municipal ownership of our public utilities were not only in error, but that if their theories were put into effect the results would be disastrous. I was forced to the conclusion in my study there that no set of men will administer a public property as economically and in as businesslike a manner as would that same set of men if their own money were invested in that property. It just is not humanly possible to expect as economical results from a property administered by politicians as from one privately administered. I might add, also, that there is no attempt over there to confiscate privately owned corporations, as has been so many times attempted here.

UNFAIR TRANSPORTATION COMPETITION INDEFENSIBLE

Before the war practically all our city and interurban transportation was by electric cars. Then came the jitneys, followed by makeshift buses, operated by the same irresponsible element that had previously operated the jitneys. The street car man had a rightful, definite prejudice against the jitney. This prejudice followed the earlier buses. But today the electric car man has little or no prejudice against the bus. He wants and needs the bus and recognizes it as a progressive transportation tool.

We do most definitely object to the uses to which buses are put by irresponsible pirates who seek to blackmail us and jeopardize our investments so that we will buy them out. In thus objecting we are acting for the best interests of our communities, which must eventually pay the cost of such destructive competition. We also have definite objections to the shortsighted bus manufacturer who will willingly be a party to such competition. Irresponsible transportation operation is always a public nuisance. Keep in mind also that the responsibility of the so-called independent operator is measured in part by his ability to pay a $100,000 loss if the bus you were riding in has an accident such as may happen and does happen at times even with the most careful of the responsible companies.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 4—**American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

March 8-10—**Oklahoma Utilities Association, ninth annual convention, Huckins Hotel, Oklahoma City, Okla.**

March 17-18—**Illinois Electric Railways Association, seventh annual joint convention, Hotel Abraham Lincoln, Springfield, Ill.**

April 26-29—**Southwestern Public Service Association, convention, New Orleans, La.**

May 31—June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.**

I have said before and I say again that we will need and use many more buses in the future than we do today, but those buses should be and will be co-ordinated with electric cars. Undoubtedly there are communities and some interurban lines where the bus should and will entirely supersede the electric car. A number of electric car lines, both city and interurban, were built because they were community builders, and those who constructed them were building for the community's future. Real estate values were increased manyfold and the electric railway builder was welcomed with open arms. This would not have been true if these railways had not been constructed by responsible people with something worth while to offer, and it is essential that due and careful consideration should be given to the protection of these community investments to the greatest extent practicable.

TRANSPORTATION CHARGES TOO LOW

Today a very considerable number of people are using the privately owned automobile who previously used public transportation, but public transportation still remains a civic necessity if our communities are to grow and prosper. In that connection I want to draw attention to what I believe is a fundamental fallacy. There is entirely too much agitation for too low a transportation charge. I do not find fault with my neighbor because he wants to buy his ride cheaper, but I do say to him and to you that what he really needs above all else is service. I maintain that the better service would be worth far more than the extra pennies it would cost and that no better community investment could be made from the standpoint of economy and of prosperity. The day will come, too, when more money will not be forthcoming for needed improvements, unless the rate of fare pays the cost of the service, including the cost of money.

I believe that there are but few cities or systems where there has been as yet real co-ordination between street car and bus. The car must of necessity remain the vehicle to carry large masses of people at the lowest rate of fare. There is open a new and most attractive field for the bus, catering to those who desire a more expensive, more exclusive or faster service. The bus in semi-competition might carry a considerably less number of people per vehicle, give a seat to every passenger and make but comparatively few stops, or a limited car and local bus service might better serve the community. In many of our cities, even large ones, there are sections where, when the old track becomes worn out, new track should not be installed but buses should take the place of the electric car.

When I say that I see a broader field in many communities for the bus than has as yet been utilized, with that statement must go two others: first, the community must pay the cost of the ride whether it be by bus or electric car, or service such as I am speaking of is not possible; second, there must be co-ordination to the extent that is only possible when the electric cars and the buses are under one management and that management a responsible one.

There is also admittedly a prohibitive cost entailed if too much additional service is provided. There may temporarily be actual competition between the bus and the electric car. Such competition cannot eventually continue. It is against all economic laws. The community cannot afford to pay the price of duplicate service.

Referring directly to Louisville, I do not know what eventually will be the legal outcome of the bus competition and street car situation here, but I do know that eventually the people of Louisville cannot have a bus company in here taking away the cream of the traffic from the electric railway company and still continue to have that street car service which is necessary for their very lifeblood. An irresponsible pirate operating solely for his own benefit and under no obligation to serve all the people all the time has no moral right to take the cream of traffic and thereby weaken or break the organized transportation enterprise which operates under public control for the public benefit. I want here to commend those far-seeing bus manufacturers who with vision and foresight have so shaped their individual sales policies as to withhold aid or assistance to bus operators seeking to undermine the established transportation of a community.

When hard-headed business men like these bus manufacturers visage the fact and appreciate the necessity of doing business with responsible transportation companies, it would seem to me that there should also be a full community appreciation of the underlying facts and consequences.

BUS A MERCHANDISING VEHICLE

The bus has some undesirable features, due primarily to the mechanical limitations of the present status of the art, but the bus is a merchandising vehicle and we electric railway men must go farther than we have in our appreciation of what the bus can do, not only as a transportation vehicle, but as a selling and merchandising tool, a vehicle with many features inviting to our customers. We recognize that we cannot meet the competition of the private automobile and other new and changed conditions of today if we continue to operate the same cars under the same conditions as we did ten years ago. We must not only modernize our equipment, but we must do what a considerable number of the progressive properties down in this part of the country are doing. Take the Louisville Railway, the Kentucky Traction & Terminal Company, and the Interstate Public Service Company—three properties with which I happen to be reasonably familiar—they are not doing today what they were doing ten years ago. There is a new order in effect. Their car equipment is meeting today's conditions, and further, these companies are recognized nationally as leaders in a public relations policy, in a desire to satisfy their customers. It remains for the people of these communities, as of communities elsewhere, to choose and be given just the kind of transportation service they desire, but I must say again, and I say it in no mean way, that they must pay the cost of the service rendered. Here are men able and willing, and the financial groups behind them are able and willing, to go forward as distinct assets to the community served. It is for the public—our customers—to decide, but I believe that I as a representative of the electric railway companies would not be doing my duty did I not point out the underlying facts.

Air Brake Requires Proper Installation and Maintenance*

By W. M. C. Horner

Mechanical Expert Westinghouse Air Brake Company

For many years the installation of the brake equipment on electric cars in many cases did not receive the consideration it merits. Consequently there are a great many cars which have been in service for a number of years that are equipped with brake cylinders much too small to provide a satisfactory brake and at the same time keep the leverage ratio within the prescribed maximum of 12 to 1. There are some cases where cars have had as high as 18 to 1 total leverage. Inasmuch as this is a subject in which every operating man is interested, I wish to take this opportunity to review a few of the essential factors involved in the design of an efficient air brake.

First, as to pressure: If more than 2 per cent braking power per pound of cylinder pressure is attempted, a very high braking power for light cylinder pressures is obtained and, therefore, the cars cannot be handled without shocks at low speeds, and either the range between the maximum and minimum braking power obtainable must be very narrow or else wheel sliding will result when the maximum power is used.

Second, as to area of brake piston: If the ratio of cylinder piston area to cylinder pressure is excessive, it means either a low leverage, which means great shoe movement, or higher leverage with low pressure, which means very narrow range between maximum and minimum braking power.

Third, as to leverage: If the leverage is too low, it means excessive air consumption and too much shoe movement; if too high (that is, brake cylinder too small for weight of car, and it is here that the principles governing brake design are violated most frequently), smooth and accurate handling of the car or train becomes impossible and the shoes are constantly grinding on the wheels, consuming energy, wearing out the shoes and causing loss of time; or else piston travel must be lengthened out, thus greatly increasing the air consumption, lengthening the time of application and release and reducing both service and emergency braking power. The high leverage makes necessary a frequent adjustment of piston travel. Otherwise a constant and very rapid decrease of braking power will result. If high leverage is accomplished at truck levers, it necessitates low hung brake shoes, which, when suspended from a spring-supported part of the truck, will result in great increase of piston travel and consequent decrease of braking power with the loading of the car. The action of the brake itself tends to compress the truck springs and magnifies this condition. Consequently when the air pressure in the brake cylinder is released and the car is unloaded the brake will remain applied because all the shoe clearance has been absorbed by the false travel. This always occurs at a time when readjustment of piston travel is impracticable and when instead of a decrease of braking power an increase is greatly to be desired. In addition, the danger of the levers fouling is increased, particularly where the truck leverage ratio is high, and for that reason very frequent and careful inspection is required or the total loss of the brake may result.

Satisfactory Brakes Require Proper Installation

All of the preceding could be very much elaborated upon, but it is thought that enough has been said to show that the braking problem warrants careful consideration with regard to both the kind of brake and its proper installation.

Coming to the mechanical requirements of the foundation brake gear, the most desirable features in connection with this matter are a motor truck that will permit a brake design providing a lower truck leverage ratio and an unobstructed movement throughout the range of brake shoe wear—say 1½ in. There should also be provision in motor truck construction for the best location of the brake shoes on the wheel and suspension of the brake head or beam hangers at a proper angle and at such a point on the truck as will maintain a fixed location of the shoes on the wheel, regardless of whether the car is light or loaded.

Economy and safety are prime requirements in railway operation, and as the brake is a most vital safety factor it should have consideration commensurate with its importance. In the design of cars and trucks, ample space should be allowed for the application of the proper brake equipment, including a suitable foundation brake gear right down to the brake shoes. In the event of piston travel adjustment being neglected, the piston should strike the head before the radius bar, or levers foul.

Satisfactory Performance Limits Lever Ratio

While a total leverage of from 9 to 1 or a maximum of 12 to 1 is proper, yet the total truck leverage ratio should not exceed 6 to 1; i. e., 1 lb. exertion on the truck pull rod should not give more than 6 lb. of force distributed at the four wheel shoes. This, of course, would mean a ratio of 3 to 1 for each truck lever, but 2½ to 1 is even preferable. This latter would mean a total truck leverage ratio of 5 to 1. When this is exceeded, the travel of the top end of the lever becomes too great as compared with shoe wear. In addition the shoe has to be placed very low on the wheel and there is increased danger of the lever fouling on the shoe. The lower the truck ratio is held the less change of angle there is for a given shoe wear.

Uniform Piston Travel Is Important

Proper provision should be made for maintaining as near a uniform piston travel as practicable for the following reasons: (1) That the air consumption may be kept low; (2) that the braking power may always be uniform, and (3) that a full power brake is assured at all times. For satisfactory brake operation the following factors should be considered: Release springs of proper strength; brake shoes of proper thickness, area and friction; live and dead truck levers of the same proportion when motors are on each truck axle, or, if otherwise, proportioned to allow for motor and non-motor axles; ample provision for take-up of shoe wear, slack, etc.; levers and rods so proportioned that they will be at right angles to each other when brakes are fully applied; elimination, as far as possible, of lost motion in journal boxes, pin holes, center plates, etc. The car should have reasonably large truck centers to admit of proper connection of body levers to truck levers by means of pull rods; the hand brake should be equalized and the multiplication made so that a large force can be applied to the hand brake chain with comparatively small amount of chain wrap-up.

An important phase of brake maintenance which is often troublesome at this season of the year is the question of moisture in the air brake system. The amount of this moisture, of course, depends on the humidity of the atmosphere at any given time. Frequently these atmospheric conditions are such that a considerable quantity of water will enter the air brake system. The water contained in the air is in the form of a vapor which saturates the air to a lesser or greater degree. Relative humidity is expressed in percentage and is a measure of the degree of saturation of the air at any given pressure and temperature. If air is at 100 per cent humidity it contains all the moisture it can hold at that pressure and temperature. When the pressure of the air is changed the ability of the air to hold moisture changes. As the pressure is increased the ability of air to hold water is decreased. The effect of temperature is exactly the reverse; as the temperature is increased the ability of air to hold moisture is increased.

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*Paper delivered before meeting of Central Electric Railway Master Mechanics Association, Toledo, Ohio, Feb. 3, 1927.

As air is compressed its temperature increases. Consequently there is little moisture in evidence near the compressor or for a considerable distance beyond, even though the pressure has been increased. However, as soon as the air cools down its ability to hold moisture at the increased pressure decreases. All the moisture which is present in excess of the amount necessary to saturate the air 100 per cent will be deposited in the reservoir or cooling pipe. The amount of water deposited depends on the percentage of moisture in the air when it is drawn into the compressor. After the air is thoroughly cooled to the atmospheric temperature it will be more or less expanded as it passes into the air brake system. This expansion will, of course, further cool the air, but the reduction of pressure and the tendency toward increase in temperature due to the then higher atmospheric temperature will operate to keep the air dry; i. e., at less than 100 per cent saturation.

WATER CAUSES MANY TROUBLES

The presence of water in the air brake system is decidedly objectionable from two standpoints: (1) Because of the harmful action of moisture on the working surfaces of air brake devices, and (2) because of freezing. Moisture distributed in the air brake system causes rusting of the interior iron surfaces, and frequently this rusting action is extremely rapid because of certain gases which are present in the atmosphere. These gases, such as carbon dioxide, tend to make this moisture of an acid nature. When water is present in any considerable quantities it tends to wash the rust and other dirt that may enter the air brake system into the triple valves, emergency valves and other devices, with the result that the operation of the brake equipment will be errratic, or even defective, unless the equipment devices are frequently cleaned. The cleaning of air brake devices is an expensive proposition and is frequently unnecessary if proper means are employed to eliminate moisture.

The freezing of moisture in the air brake system is, of course, a well known objectionable feature, because all air operated devices can be blocked by ice and rendered inoperative if sufficient moisture is present under such conditions. The solution of this problem is, of course, to keep the water out of the air brake system. This can only be done where an adequate cooling system is installed. There are many railway cars now in service which have adequate cooling facilities provided in the main reservoir portion of their brake systems, and these operate daily in severe cold weather without freezing troubles. There are other brake installations which are not so satisfactory and therefore need a carefully planned arrangement of radiating pipe to obtain the desired cooling effect.

Unless care is taken in the installation of radiating pipe the full effectiveness will not be obtained. Sufficient length of pipe is often installed, but it is located above the sills, where it does not get a free circulation of air, and very often it runs close to resistance units which throw off considerable heat, thereby defeating the purpose of the installation. When radiating pipe is properly installed freezing troubles can be invariably eliminated.

FREEZING ELIMINATED ON THE N. O. P. & L.

Last winter the Northern Ohio Power & Light Company had a real epidemic of freezing, which was attacked in a real business-like fashion by making certain changes along the lines referred to above, that gave satisfactory results. The changes on some of the cars were rather elaborate and involved considerable expense. However, I believe Mr. See, master mechanic of that property, will tell you that the cost has been repaid. The man who thawed out cars last winter told me the other day that he formerly used 2 gal. of gasoline every day in a blow torch, but that he forgets to bring the torch out most of the time now as he has no need for it.

By way of contrast, it might be interesting to mention another property that could not be convinced that radiating pipe, properly installed, could be depended upon to obtain the desired results, and therefore refused to use it. In order to protect its equipment against freezing the emergency valve, governor, quick release valve, main reservoir cut-off valve and a combined check valve and strainer were installed in a well-made box which was lined with felt. In spite of this there was freezing, which was later eliminated by installing two 23-watt lamps inside the box along with the apparatus. On tests made when the outside temperature was 12 deg. below zero the inside of the box registered 36 deg. I have examined the valves on this property a number of times and have found that in two months the inside of the valves have become very rusty, showing the presence of considerable moisture. It is necessary to clean these valves every two months.

I have just examined several valves which have been in service approximately twelve months on a property where freezing is avoided by eliminating moisture by radiation and found the emergency valves in very good condition, free from rust and evidence of moisture. The difference in maintenance expense as compared with the other road mentioned where the valves have to be removed, cleaned and lubricated every two months is obvious.

I wish to lay special emphasis on the desirability of suitable protection of the air compressors against the entrance of dirt. If an air compressor is kept clean it will run almost indefinitely without excessive wear. It was my privilege recently to examine some compressors which had been in service for six years on a property which has no regular general inspection or overhauling periods for compressors. The only time they get to the shop is when something goes wrong, but they have a very efficient suction strainer arrangement. The oil was almost entirely free of any sediment, the gear and pinion were in fine shape, it was only necessary to take out one shim in the connecting rod crankshaft bearing and we could detect only 0.0015 in. wear in the cylinders. The condition of this compressor showed very forcibly how simple it is to increase compressor life with very little cost for maintenance if clean air is furnished at the suction.

I would like to add a word or two concerning the composition packing which our company developed primarily for brake cylinder packings, but which is now being substituted for leather in all air brake devices except in a few cases where leather seems the best suited. We were obliged to go into the manufacturing of composition packing for brake cylinders because of the tendency of leather cups to lose the filler with which they are impregnated, causing them to become porous in a short time.

The new material, known under the trade name of "Wabco," is highly oil resisting, which insures against excessive brake cylinder leakage during the life of the cup. The packing cups are made fairly firm in order that a uniform bearing be maintained against the cylinder wall without the aid of an expander ring. Therefore, it is necessary to exercise reasonable care in handling, in order that the material is not cracked or broken before being installed. Rubber, which is used as a base in this composition, has a natural tendency to vulcanize with age. This results in gaskets becoming harder than they should be when carried in storeroom stock for a considerable period. Gaskets that appear to be too hard for application to a device can be softened temporarily by soaking in warm water for a few minutes. We recommend that not more than a six months stock be carried.

Men of National Prominence to Address Oklahomans

SEVERAL men of national prominence in the public utility industry will address the ninth annual convention of the Oklahoma Utilities Association at the Huckins Hotel, Oklahoma City, on March 8, 9 and 10. They include L. S. Storrs, who will address the morning session; Frank LeRoy Blanchard, New York; H. S. Bennion, New York; Martin L. Pierce, North Canton, Ohio; H. O. Caster, New York; W. S. Vivian, Chicago; H. B. Flowers, New Orleans; Samuel A. Chase, Mansfield, Ohio; Earl W. Hodges, New York. The latter will be the principal speaker at the annual banquet to be held at the Oklahoma Club on Wednesday night, March 9.

The News of the Industry

Higher Rates in Fort Worth

Northern Texas Traction Hopes to Sell 5,000 Nickel Passes a Week—Intensive Campaign

Negotiations between the city of Fort Worth, Tex., and the Northern Texas Traction Company culminated on Feb. 1 in a unanimous vote by the City Council granting a fare adjustment. The conferences occupied only about two months. The company made formal application on Dec. 1, 1926, to the Fort Worth City Council for an adjustment of the rates. The rates finally agreed upon and mentioned in the ELECTRIC RAILWAY JOURNAL issue of Feb. 12, page 307, were: Cash fare, 10 cents; three tokens for 25 cents; nickel pass at 40 cents a week, plus 5 cents per ride; half fares, 5 cents cash with six tokens for 25 cents.

These new rates replace a 7-cent adult and 3½-cent children's fare. Fares on the motor coaches remained at 10 cents straight, this fare entitling the rider to transfer to and from cars.

The new rate embodied in the nickel pass is a departure. With twelve rides a week, the average fare on the ticket is 8⅓ cents. In its plea before the Council the railway stated that from 25 to 30 per cent of its passengers would ride on the nickel pass.

Having sold the nickel pass idea to the City Council, the next job on the part of the railway was to sell it to the public. This was accomplished by holding a week-end bargain sale of street car rides. On Feb. 2 at noon the operators on every city car handed a pamphlet to every street car rider. This pamphlet reproduced the nickel pass, good until midnight Feb. 6, and invited the public to use it with the railway's compliments. The result was that within 24 hours practically everybody in Fort Worth understood the nickel pass, how it worked and what its possibilities were. The effect was, of course, to carry everybody for a 5-cent fare from Feb. 2 noon until midnight of Feb. 6. During the 4½ days the riding increased about 10 per cent, while the city revenue decreased about 20 per cent. In addition a kindly feeling was created among the public that brought the railroad many compliments. It is the plan of the company to have the public educated to the point where it can sell 5,000 to 6,000 nickel passes a week.

The railway at Fort Worth, in addition to handing out the explanatory pamphlets, had inspectors and commercial representatives canvassing all of the stores and large establishments, giving out booklets describing the nickel pass. The result was that the railway received checks from a number of concerns to cover passes for all of the employees. Some concerns presented these to their employees with their compliments. For example, the railway sold Sanger Brothers, one of the leading department stores, 300 nickel passes at 40 cents each, and to another concern it sold 100. The railway hopes to make this a permanent arrangement and to intrigue other concerns to follow suit.

As a preliminary to the installation of the new fares the company has been holding meetings of its city trainmen and adopting many novel stunts, with the result that when the new rates went into effect on Feb. 7 the company had about 500 of the most enthusiastic salesmen ready to do duty. The complete application was reproduced as a page "ad" in several of the daily papers and pamphlets addressed "To Our Patrons" were distributed to many outbound passengers.

In addition to the beneficial effects of the new fares on the infrequent rider, the casual rider and the wholesale rider, the management sees an added advantage in the new schedule, namely, the getting away entirely from odd pennies. This is considered to be a tremendous help in speeding up service and relieving platform congestion, as service on the city lines is 100 per cent one-man.

Utilities Not Stressed in Messages

Only Slightly Do Governors' Addresses Affect Railway or Bus Industry—Motor Vehicle, Home Rule and Commission Regulation Mentioned

LEGISLATIVE sessions are being held this winter and spring in nearly all the states. Of the messages studied little is said on the subject of public utilities. Most of the governors made no plea or promised no legislation for the railways or their subsidiaries, but many of the chief executives stressed the need for continued construction and development of the highway, discussing in connection with the good road movement, the importance of renewed vigilance of safety for the public. The states from which this message of highway development emanated included New Hampshire, Maine, Delaware, Montana, South Dakota, Vermont, Minnesota and North Dakota. Of the 35 addresses to the various legislative bodies considered seventeen contained some pertinent remarks of interest to utility operators. This proposed legislation would affect motor vehicles, gasoline and other taxes, service commission duties, bus regulation and home rule. These were made in the states of New York, New Jersey, Ohio, Maryland, Rhode Island, Tennessee, Pennsylvania, Kansas, Oregon, Washington, North Carolina, Iowa, Connecticut, Wisconsin, Idaho, Massachusetts and California. Extracts of the messages in New York, New Jersey, Ohio, Maryland, Massachusetts and California follow:

NEW YORK

Governor Smith of New York called attention to the still unsolved phase of home rule, namely, the administration of local public utilities. He said that he had consistently called attention to the injustice to local governments brought about by the amendments to the public service law, made in 1921. In his opinion the state should return to the municipalities the free hand they once had to deal for themselves with the corporation with which they made contracts at any time in the past. He was never able to find any fault with a policy of decentralization that would delegate to municipalities, where they desired to exercise it, the right of the state to regulate all public utility corporations operating wholly within their borders. The state should be empowered to delegate to localities when they so request or to an agency established and designated by the local government the regulatory powers now held by state agencies. He said: "It is time we ceased to hamper the freedom of municipalities to own and operate public utilities. Public ownership and operation are not untried theories."

The successful co-operation between the public at large and the officials charged with the administration of the motor vehicle law was in no small measure responsible for the decrease in deaths due to motor vehicle operation during 1926 compared with the year previous.

NEW JERSEY

The problem of improved transit facilities among the communities of northern New Jersey and between those communities and New York City, which has been the subject of serious study by the North Jersey Transit Commission, was referred to by the Hon. A. Harry Moore, Governor of New Jersey, in his message to the 151st Legislature. He said that this commission would report as to the progress of its work during the 1927 legislative session, that a careful study of that report would serve not only further to demonstrate the far-reaching importance to the state as a whole of these studies but also the tremendous difficulties and the enormous amount of work confronting this unsalaried commission before there could be solved the legal, financial and engineering problems involved in the establishment of a rapid transit system functioning not only within the boundaries of New Jersey but requiring, as well, the crossing of the political geographical barrier of the Hudson River. He said that such a plan, when fully developed, would affect in one way or another every railroad with terminal facilities on the west bank of the Hudson and would require the active co-operation of the authorities of New York for its practical realization. Much work remains to be done.

OHIO

On the subject of public utilities, Governor Donahey asserted it was the duty of this session to submit three names for an entirely new commission, because of the failure of the last Ohio Senate to confirm his appointments to the Public Service Commission. The law, however, contemplated the appointment of only one new member every two years. He said the new appointment would be sent to the Senate for consideration in the near future and asked the present Senate not to adopt the policy of the two preceding ones in permitting important appointments to lie dormant in committee for weeks or months. He said that after consultation with the new commission he proposed to submit for the Legislature's consideration some concrete recommendations as to needed statutory changes in methods of operation and procedure of the Public Utilities Commission. He recommended an excise tax on motor transportation companies operating as public utilities "which up to this time have escaped this form of taxation," and this in addition to the special taxes which are paid for the privilege of using the streets and highways for the purpose of transporting passengers and property for hire.

MARYLAND

Gov. Albert C. Ritchie told the General Assembly of 1927 that experience had shown that certain amendments were needed to strengthen the powers of the Public Service Commission. He said that among the measures that would be submitted in this connection were bills providing for indeterminate rate orders; requiring the consent of the commission for the abandonment of franchises acquired and exercised before as well as after the enactment of the public service commission law; empowering the commission to fix the minimum as well as the maximum rates; empowering the commission to suspend proposed rates, pending a determination of their reasonableness; authorizing joint investigations, hearings and orders in conjunction with the commissions of other states or of the federal government in the case of interstate utilities, and restoring the office of general counsel to the commission.

MASSACHUSETTS

Gov. Alvan T. Fuller, speaking before both branches of the Legislature on Jan. 6, recommended further consideration of a gasoline tax of 2 cents a gallon with a corresponding reduction in the present registration fees. This would have the advantage of raising a substantial amount from visiting tourists, he claims, who now contribute nothing toward the upkeep of the highways.

On the subject of public utilities, he said that the Department of Public Utilities should be responsible to the public for establishing and maintaining reasonable rates. The Public Utilities Commission should be the guardian of the public interest. It should require reports and be able to analyze them so that a proper relationship could be secured between returns to the stockholder and charges to the consumer, "always bearing in mind that the consumer has not been afforded that best protection which can be given to any consumer, namely, competition for his patronage." The advantage of this competition had been denied him by giving utility companies a monopoly. He asked if it were not surprising that all public service companies had not learned the lesson that the interests of the company could be best served by meriting the confidence and good will of the public.

On the control of public utilities he recommended legislation to meet the situation of public utility companies passing under the control of interests outside the state through the medium of holding companies. He quoted Section 10 of Chapter 181 of the General Laws and recommended that the statute be amended so that it would provide that whenever it should appear that a majority of the common or other stock having voting power in the domestic company was owned or controlled by a foreign corporation the Supreme Judicial Court should have jurisdiction in equity to dissolve such domestic company. As there were a number of these holding companies organized under the laws of the Commonwealth, the amendment to the law should be so drafted as to apply to holding companies, whether domestic or foreign.

Governor Fuller's message stressed the problems growing out of the Boston Elevated Railway, with its varied equipment for transporting the public. Among other things he suggested for public consideration legislation continuing the present public control of the Elevated for a period sufficient to effect a substantial decrease in dividends and interest. The assurances necessary to obtain these concessions in the return to be paid on capital could be given without actually involving the treasury of the Commonwealth in the least or binding the public trustees to do more than keep fares at a proper rate. In all that is done he believed the two great objects of suitable transportation and the lowest possible expense for the capital required ought to be kept constantly in mind.

CALIFORNIA

In his address before the Legislature of California on Jan. 4 Gov. T. S. Young recommended that the present Legislature provide for a commission to investigate whether the existing tax system, with periodic justifiable increases in the public utility tax rate, would continue to provide necessary revenues for the state's normally increasing expenditures, and if not, what modification should be made in the present system to put it on a safe, permanent and equitable basis.

Tacoma Survey to Be Concluded

Officials of the Tacoma Railway & Power Company, Tacoma, Wash., have interviewed thousands of Tacoma citizens in the past few weeks in an effort to get data on what the public thinks of the city's railway service, and to learn what is wanted by the public in the way of additional or improved service. The survey is being made by the Beckmann-Hollister Company, San Francisco, with Miles F. Hollister of the company personally directing the work. The City Council and Mayor Melvin G. Tennant have been co-operating with railway officials in an effort to solve the railway problem.

New Reserve Clause Inserted in Kansas City Franchise

A reserve fund for maintenance purposes of approximately $400,000 will have to be set up by the new Kansas City Public Service Company, Kansas City, Mo., under a clause just inserted by the special committee in the proposed franchise. The reserve fund would be created gradually out of the earnings of the company and could be used only for emergencies. It is thought that this reserve fund is the only new feature not already made public that will appear in the proposed franchise, a 30-year grant to replace the one under which the company is now operating. The other terms of the franchise are said to follow closely the committee's recommendations made to the Council last December.

The new franchise is virtually ready to be presented to the Council. It remains only to be drawn up legally. One more meeting of the committee will then take place before the franchise is presented to the Council. After its introduction in the Council the grant would be referred to a committee, which would hold a public hearing within a week. The measure would come up for passage at the third reading in the Council.

Rearrangement of Akron Operation Proposed

A. C. Blinn, vice-president and general manager of the Northern Ohio Power & Light Company, Akron, Ohio, has proposed a plan for changing railway and bus routes and schedules in Akron that will save approximately 1,600,000 operating miles annually, better the service and decrease operating costs. It will be put into effect when approved by City Council.

Alterations proposed by the company will help keep city bus and car fares down by enabling the company to reduce its operating losses on the Akron transportation system, Mr. Blinn told councilmen. He said:

> N.O.P. transportation operations went heavily into red ink during 1926, as against a net of $48,813 after taxes in 1925. If we fail to operate with a profit this year, there will be no alternative but a higher fare when we seek a new franchise in 1929.

The transportation changes affect duplicating operations during dull periods, which eat heavily into operating costs, according to Mr. Blinn. Improved service is planned in rush hours.

New Proposals Expected in Toledo

Following a lull of two months in railway negotiations at Toledo, Ohio, which were aiming at a revision of the Milner ordinance or a complete new plan of unified traction and bus service it is believed some new proposals may be made soon by the representatives of the Community Traction Company. An ordinance was prepared but after receiving disapproval of the street railway board of control and a special committee of the Chamber of Commerce was abandoned for the time being. Possibly the new negotiations may seek to use this ordinance and the construction suggestions as a basis for a new plan. Original negotiations to secure better service, lower fares and better street paving and maintenance arrangements were started nearly two years ago and involved a study of the transit system of Toledo by Prof. H. E. Riggs of the University of Michigan.

The Rocky Mountain Canary Carols Its Tune in Denver

In the city of Denver, Col., there is an eight-page paper, 12 in. x 17 in., called the *Rocky Mountain Canary*. It is published every Saturday and the Denver Tramway is evidently one of the main distributors, the paper being placed in an open box in a prominent part of the cars, a sign thereon reading "Take One." Ten thousand copies are printed each week. In every edition there is an invitation to the public to submit a slogan for the big placards carried on the front of all the company's cars. The prize to the winner of slogan contests is 100 car checks, of a value of $7.50.

As a sample of the winning slogan, the issue of the *Canary* for Jan. 22 prints: "Denver gets you in the end. It's a great place to live."

In the same issue the tramway offers a $5 prize for the best letter of not more than 100 words on "Why I Ride the Street Cars." For any other letters on the subject that are used by the *Canary*, $1 is paid, and then the *Canary* is going to print news of grocery bargains close to car lines, clothing bargains, meat bargains, etc., and says that in this way "we will make your car slugs pay."

Rehearing on Syracuse Fares

Chairman Prendergast of the Public Service Commission on Feb. 17 heard the application of Mayor Hanna of Syracuse for a rehearing on the order of the commission establishing a rate of seven tickets for 75 cents, 10 cents cash fare, on the New York State Railway Lines in Syracuse. The commission had previously denied the application for a suspension of the order dated on Feb. 2, to be effective Feb. 10, pending this rehearing.

The city's request for a rehearing was based on the valuation of the property of the company and the order requiring that tickets be sold in blocks of ten for 75 cents, which it believed was injustice to the small wage earner. Mayor Hanna petitioned the commission to require that two tickets be sold for 15 cents with four tickets for 30 cents. The railroad maintained that the order of the commission was fair to all parties and that to increase the number of transactions by selling tickets as suggested by the city would delay the operation of cars. Decision on the application for rehearing was reserved.

Relief from Paving Cost Sought by Detroit Municipal Railway

Upon the suggestion of Del A. Smith, acting general manager of the Department of Street Railways at Detroit, Mich., the City Council has passed a resolution instructing the Corporation Counsel to prepare a charter amendment to relieve the municipal railway of the burden of paving between tracks. The amendment will place the cost of such paving between tracks on the general tax roll. The matter will be voted on by the people at the April 4 election.

In bringing the subject to the attention of the Council, Mr. Smith cited that between July 1, 1925, and Dec. 31, 1926, the D.S.R. expended $542,652.02 in paving between tracks. John C. Lodge, president of the Council, in commenting on the proposal, cited that under the present system of making the car rider pay for the pavement between tracks. Mr. Smith cited the general tendency to relieve street railways of the paving burden, and said that the money expended in this direction in Detroit, if diverted to exclusive railway purposes, would most certainly add materially to transportation facilities.

Postponement in St. Louis on Fare Hearing

Three federal judges, including two district and one appellate jurist, were not available at Kansas City, Mo., on Feb. 15 so the hearing could not be held on the application of Rolla Wells, receiver of the United Railways, St. Louis, Mo., that its 8-cent basic fare rate be made permanent. A postponement until Feb. 25 was ordered by United States District Judge Reeves, who issued the temporary restraining order against the Missouri Public Service Commission and other state officials under which Receiver Wells put the new rates into effect on Feb. 7.

Prior to announcing the postponement of the hearing Judge Reeves in Chambers listened to motions by City Counselor Muench of St. Louis and Attorney-General Gentry on behalf of the state, and J. P. Painter, counsel for the Missouri Public Service Commission, for a dismissal of the case on the grounds that the federal court lacked jurisdiction. The judge indicated that the points raised had caused serious doubt in his mind as to the right of the federal court to assume charge of the rate question. These motions will be taken up first on Feb. 25, when Judge Kimbrough Stone of the United States Court of Appeals and Districts Judges Reeves and Otis will pass on the case.

City Counselor Muench contended that inasmuch as Receiver Wells on behalf of the company on his own motion had appealed to the Missouri Public Service Commission for a higher fare no action in the federal court should be had until the state commission has handed down its decision. The commission has had the rate question in charge since last June. However, Receiver Wells has contended that the state body has needlessly delayed a decision and that its failure to act has resulted in the confiscation of the company's property in violation of the United States Constitution.

Early Subway Building Is Promised by Chicago Mayor

Assurance that Chicago's vital subway question would be disentangled, for the time being at least, from the main body of local transportation problems now confronting city and traction officials and apparently destined to indefinite delay was given by Mayor William E. Dever in a pre-election address on Feb. 17.

The Mayor revealed that a subway ordinance drawn up by Major R. F. Kelker, Jr., city engineer, in conformity with the Mayor's own recommendation and, in many respects, with the report of the citizens' subway commission, will be reported to the local transportation committee of the City Council in the next few days.

Mayor Dever has incorporated subway construction along the lines proposed in this ordinance as one of the chief planks in his campaign for re-election next April and is demanding immediate action toward that end.

He indicated that if the ordinance should be approved by the Council, it will probably be submitted to the voters at the judicial election in June. Then, if the referendum is carried, assessment proceedings will be started in the courts and construction begun at once.

Local regulation of public utilities is another important plank in the Mayor's platform. A petition sponsored by Mr. Dever is now being circulated by his party workers for a referendum on the question of home rule on April 5, the date of the mayoralty election. In order to give the city of Chicago control over its local utilities, enabling legislation must be obtained from the State Legislature at Springfield.

Railway Project in Missouri

Willard E. Winner, pioneer developer, has associated himself with several citizens of Liberty, Mo., in the organization of a company to build and operate an electric railway from Liberty to Kansas City. A corporation capitalized at $300,000 is being formed. The projectors plan to cross the Missouri River with their line at a point east of the city limits of Kansas City, at which place the river is especially narrow. From the river the line would go almost directly to Liberty, passing just east of Birmingham. At a point 3 miles out of Liberty there would be a branch east to the Atwood quarries.

The men listed as directors are: Lee Clark, Mayor of Liberty; C. P. Atwood; A. W. Lightburne; J. A. Reed; Robert Don Carlos, circuit clerk of Clay County; Pascal Parker; Harry Griffith; E. T. Brant; J. W. Pryor; J. S. Conway, and W. E. Barnes, city engineer of Liberty.

New Crimson Limited in Texas Makes 1927 Appearance

The new 1927 Crimson Limited operated by the Northern Texas Traction Company between Dallas and Fort Worth was placed in service on Feb. 12 after having been exhibited in Fort Worth on Feb. 9 and in Dallas on Feb. 11. The new model was described in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 5, page 246. Whereas the trailer is practically the same as on the new train put into service last October, the motor car has been completely changed, the biggest improvement being a very comfortable, heavily upholstered, genuine leather bucket seat.

In spite of the rain and sleet more than 1,100 people went through the train when it was exhibited and received a copy of the pamphlet describing service. Another 1,000 people went through it in Dallas in the Interurban Terminal. A check-up on the riding in Fort Worth reveals that already a number of local people who have been using their automobiles between Dallas and Fort Worth have now gone back to the interurban.

On the occasion of the installation of the 1927 Crimson Limited the company distributed an interesting and informative booklet on the advantages of riding in this de luxe interurban. The purpose of the booklet was to get the public to thinking along proper lines on the place of the bus and interurban in transportation.

Another Fare Hearing in New Jersey Case

Decision on motion made on Feb. 16 to dismiss the application of the Public Service Transportation Company and the Public Service Railway, Newark, N. J., for adjustment of fare zones on eleven bus lines and one railway line will be reserved by the Board of Public Utility Commissioners of New Jersey until the entire case has been presented.

This was announced in an opinion by the board, at which motion by counsel of affected municipalities to adjourn the case three months was denied. The board set March 21 and 25 for the next hearings. In delaying decision on motions for dismissal, the board said:

> At the close of the testimony given by the petitioners counsel for the various municipalities addressed motions to the board to dismiss the petitions on the grounds of lack of jurisdiction on the part of the board and also because of the insufficiency of the evidence to support the allegations and prayer of the petitions. Without going into the detail of the reasons raised by the motions, the board is of the opinion that the motions should be reserved to the end of the case and should not be considered until after all parties have had an opportunity to present their evidence.

Speaking on the request to adjourn the case three months, the board pointed out that the petitions of the companies were filed on Dec. 14 and they were brought on for hearing on Jan. 19. Adjournment was then taken until Feb. 16. The board said:

> Under the circumstances the board feels that an adjournment to March 21 should allow ample time for the counsel of the municipalities to obtain the necessary data for the preparation of their case.

News Notes

Eight Cents in Sioux City.—Fares on the lines of the Sioux City Service, Sioux City, Iowa, will be 8 cents cash or two tickets for 15 cents after March 1. The present rate is 7 cents cash or four tokens for 25 cents. Diminishing revenue since 1921 forced the change, according to W. J. Bertke, general manager. Competition of the automobile is blamed by the railway officials for the falling off in passenger revenue.

Would Bar One-Man Cars.—About 1,500 residents of Norwood, Ala., have requested the immediate removal of one-man cars from the Norwood line and intimated that refusal to remove the pay-as-you-enter cars would mean a demand for return of the jitneys. This was the message in two petitions presented recently to City Commission.

Amplifiers in Montreal Cars.—The Montreal Tramways, Montreal, Que., has decided to install amplifiers in its cars to enable passengers to hear street names as they are announced by trainmen. Difficulty arose when the one-man cars were placed in operation for the motorman has to announce street names with his back to the passengers, and it has been practically impossible to hear him. The device will be placed in front of the operators of the cars, who will speak into it in an ordinary tone which will be audible to every passenger in the car.

No Change Expected in Transfer Charge.—Following a recent hearing, attended by representatives of the Indianapolis Street Railway, before Clyde H. Jones, member of the Indiana Public Service Commission, it was learned there was little likelihood that the commission would alter an order of more than a year ago in which the transfer fee was fixed at 2 cents. The order for the increase from 1 to 2 cents was for a year, ending Jan. 1. It was continued at that time pending a hearing.

Survey Under Way. — The town of Irvington, N. J., is making a survey of its bus and electric railway transportation with especial respect to their coordination and to the plan for re-zoning recently submitted by the Public Service Transportation Company, a subsidiary of the Public Service Railway. To conduct the survey, the town has employed Fisk & Roberts, consulting engineers, New York.

Group Insurance for Employees.—The St. Louis & Hannibal Railway, Quincy, Ill., has adopted a group program providing the working personnel with approximately $80,000 of life insurance, sick and non-occupational accident benefits and the advantages of a visiting nurse service. The insurance plan, underwritten by the Metropolitan Life Insurance Company, is co-operative, with the employer and employees sharing the cost through joint contribution toward the payment of premiums. Employees in the main group covered each receive $1,000 of life insurance. Sick and accident benefits, based on weekly earnings, average about $10 a week. Included in the group contract is a clause which guarantees payment of the full amount of an employee's life insurance to him, if he becomes totally and permanently disabled before age 60.

Foreign News

Swiss Railroad Electrification

Traffic on the Swiss Federal Railroads has been slowly declining. This has been accompanied by a falling off in the receipts, the effect of which has extended to the railroad authorities' plans for further developments. The budget for 1927 provides a sum of only $17,600,000 for new extension work as compared with $21,400,000 in 1926. As in recent years, the bulk of the money, about $11,000,000, is to be utilized for further electrification work. During the coming year this will be mainly centered in eastern Switzerland.

Among the lines in this district which are in progress of electrification or scheduled for electrification are the Richterswil-Sargan-Chur, Sargans-Buchs, Winterthur - Romanshorn - Rorschach and Winterthur - St. Gall-Rorschach routes. The budget also includes a large sum for the extension of the power generation plants; thus $800,000 is allocated to the extension of the Vernayaz hydro-electric station and $1,400,000 to the construction of additional transformer stations. The budget provision for new rolling stock for the electrified railroad shows a considerable diminution compared to previous years, but a sum of $4,400,000 is allowed for expenditure in this direction next year.

New Hydro-Electric Station to Give Power to Brenner Line

Electric trains probably will be running over the Italian and Austrian sections of the Brenner line by next year if the hydro-electric station now under construction is completed in time. This station is located in the mountains about 3 miles from the railway depot of Innsbruck. Power available will amount to about 100,000,000 kw.-hr. a year. All power produced over and above that required for railway operation and for the zinc mines of Schneeberg, as arranged between the Societa Generale Electrica Tridentina and another Italian company, will go to feed the system of the first-named company.

Polish Electrification Plan Progresses

Government and representatives of European and American utilities corporations are reported to have agreed upon the main points of the electrification project for Poland, involving an outlay of £5,000,000. The financing is to be guaranteed, it is said, by the Polish State National Economy Bank. The machinery required is to be imported from the United States.

Glasgow's New Fares Successful

Graded fares in Glasgow, Scotland, of 1 penny, 1½ pennies, 2d., the latter being the maximum rate for any distance, are proving successful from the point of view of revenue. This new scale has been in operation since last summer. There has been a decided increase in comparison with the receipts shown during a corresponding period the year before, while there was a large decrease in the revenue from shorter journeys. This was more than counterbalanced by the increase from the 2d. fares.

Liverpool Report Praises Trams

Belief in the tramcar as the best vehicle for handling heavy traffic was emphasized in the report of P. Priestly, general manager tramways department, recently submitted to the Liverpool Council, and accepted. Buses have their sphere of usefulness as feeders on routes where the traffic does not warrant the expenditure necessary to undertake tramway operation. If buses were to replace trams in Liverpool, it would require about 50 per cent more vehicles. This, in turn, would result in a bigger mileage and increased cost. Moreover, the additional vehicles would cause serious congestion.

In reply to a recent suggestion to "scrap the trams," the report went on to say that the Liverpool undertaking had a capital of nearly $3,000,000 and payments for sinking fund and interest would have to be made from the bus revenue. In addition, there would have to be new capital expenditure on the purchase of buses and this would have to be repaid in seven to ten years, as against fifteen to twenty years for a tramcar. The tramway system paid approximately £45,000 per annum in taxes, and in addition £50,000 toward road maintenance. If the trams were scrapped the latter would have to be paid out of taxes, so that a total of £95,000, equal to nearly 4d. per £1, would have to be met out of general taxation instead of being paid by the tramway as at present.

Accidents caused by electric railway cars in the past year were fewer per mile than for any other passenger vehicle, the report stated. In foggy weather tram service can be run when all motor vehicles are brought to a standstill.

Floor Signs Used to Direct Passengers.—Traffic direction signs are being tried by the London Underground at the Charing Cross station. There are two types in use, one composed of aluminum letters inlaid in rubber and the other having illuminated glass letters. They are set into floors of passages to direct passengers.

Trolley Line Proposed for Kavala, Greece.—Influx of refugees to the city of Kavala has so greatly increased the population of that city that despite the narrow streets the proposal is being considered to build a single-track trolley line. The present population of 80,000 people is now transported almost entirely by taxicabs.

Recent Bus Developments

Another Respite in New York Bus Wrangle

No action was taken by the Board of Estimate, New York City, N. Y., at the meeting on Feb. 24 toward approving the franchise contracts on bus operation because of the plea of Deputy Comptroller Frank J. Prial, representing Comptroller Berry, that time was needed to study the proposed forms, which had just been submitted by the Board of Transportation. The matter went over for a week. This made it necessary to abandon the date, March 22, fixed by a resolution for the statutory public hearing on the contracts as the law requires the advertising of these contracts for 27 days. It was decided to fix a new date for a vote at the subsequent meeting.

Toledo Bus Ordinance Being Prepared

Toledo, Ohio, has been without any bus regulatory legislation for nearly two years and in response to a public demand in recent weeks following a severe accident a comprehensive bus ordinance was prepared by city legal authorities. It was referred by the Council to the street railway board of control.

After study the board has stated that there was great need for protection of the public and regulations regarding equipment, safety and insurance; that nothing should be written into the ordinance which would embarrass the city in its effort to work out a unified system of bus and street railway service at some later date under a single company, and that in event of passage such an ordinance should be strictly enforced with licenses granted only to lines which would not compete directly with the Community Traction Company. The Council has indicated that it will follow the proposals of the board of control in completing the ordinance.

Gary Line Prepares Site for 90-Bus Garage

The Shore Line Motor Coach Company, a subsidiary of the Gary Railways and the Chicago, South Shore & South Bend Railroad, recently announced the purchase of a site for a large modern garage in the city of Hammond, Ind., to be built and ready for occupancy by June 1 of this year.

The garage will have storage space for about 90 motor coaches and will contain a machine shop and an overhauling department where coaches will be repaired. The cost of this improvement, including the land purchased, will be approximately $150,000.

Merger of the Calumet Motor Coach Company, which formerly operated ten local bus routes in Hammond and adjacent communities, into the Shore Line Motor Coach Company was approved by the Indiana Public Service Commission last month, making the latter company one of the largest operators of motor coaches in the Middle West. Of the total of 132 motor coaches now owned by the Shore Line Motor Coach Company, 83 operate out of the city of Hammond.

Eastern Massachusetts Receives Part Fare from Bus Company

The Public Utilities Commission of Massachusetts has granted authority to the New England Transportation Company, the bus subsidiary of the New York, New Haven & Hartford Railroad, to operate buses on the Boston-Providence route alternately operating through the towns of Walpole and Norwood in Massachusetts. The route thus covered by the bus company encroaches upon territory served by the Eastern Massachusetts Street Railway. An agreement between the two companies provides for the payment of 18 cents to the Eastern Massachusetts Street Railway for each passenger between East Walpole and Boston and between Boston and East Walpole. This agreement was not favorable to the commission. The commission says:

> However unjustifiable and unwarranted the payment to the street railway of a portion of the fare received by the transportation company may be, it does not affect the question which presents itself on this petition. The sole issue before us is whether public convenience and necessity require the operation of motor vehicles over the proposed route.

This the commission believed necessary. It did, however, say:

> In the operation of buses over the proposed route, the electric railway will not do anything to entitle it to compensation. The consideration of this payment, apparently, is in the electric railway refraining from objecting to the issuance of a certificate of public convenience and necessity.
>
> We are of the opinion that expenditures of money of a public utility is unjustifiable. If the question of the reasonableness of the rate charged by the transportation company were now before us, we would without question disallow, as an item of expense, these payments to the electric railway.
>
> However unwarranted and unjustifiable the payment to the electric railway of a portion of the fare received by the transportation company may be, it does not affect the question which presents itself on this petition. The sole issue before us is whether public convenience and necessity require the operation of motor vehicles over the proposed route. We think they do.
>
> The certificate of public convenience and necessity heretofore granted by the department on April 30, 1926, to the New England Transportation Company for the operation of buses for the carriage of passengers for hire between Attleboro and Boston is hereby amended to the following extent:
>
> Said petitioner shall be permitted to operate such buses over the following alternative route through the towns of Walpole and Norwood; from Walpole Square over Main Street, East Street, Short Street, Washington Street to the junction of Washington Street and Walpole Street in Norwood. And on said alternative route shall be permitted to make a stop in the town of East Walpole at or near the post office to take on passengers for Boston, or to let off passengers taken on at Boston.
>
> Provided, however, that no local passengers shall be accepted at any intermediate point between any stopping place in East Walpole and any point in Norwood. and provided, further, that any other restrictions in the original certificate shall remain in force.

De Luxe Service Between Newark and Hackensack

De luxe express bus service was started between Newark and Hackensack, N. J., on Feb. 13, when the Public Service Transportation Company started the operation of a line of "parlor car" buses between the two municipalities. This is the first line of the kind to be put in operation in that section of the state.

Under the schedule adopted the first bus leaves Hackensack at 7 a.m. and Newark at 8 a.m. and the last bus leaves Hackensack at 11 p.m. and Newark at 12 midnight and buses leave both terminals on the hour and half hour during the intervals between.

The through fare between Newark and Hackensack is 50 cents. The minimum fare northbound is 25 cents, good for a ride from any point in Newark to the north line of Lyndhurst. The minimum fare southbound is 10 cents, good for a ride from any point in Hackensack to Williams Street and Terrace Avenue, Hasbrouck Heights. The running time of buses between Newark and Hackensack is 50 minutes.

Service Between New Haven and Guilford to Be Resumed

Bus operation by the New Haven & Shore Line Railway between Guilford and New Haven, Conn., was resumed on Feb. 9, following a suspension of a month. It was noted recently that the bill presented in the Legislature by Representative Harry R. Durant, Guilford, would be withdrawn. This bill asked that the charter granted the New Haven & Shore Line be repealed.

William Walker, manager of the New Haven & Shore Line Railway, in making the announcement regarding bus service stated that the people had demanded this type of transportation. It was brought out that the territory between Branford and New Haven also would be served by the cars of the Connecticut Company, but that the 8 miles between Guilford and Branford was too thinly populated to net much revenue.

Representative Durant had previously branded the company's suspension of the bus line as outrageous and something that should not be tolerated. He scored the argument of the Shore Line that it could not make any money with buses on that line in the winter. It was his belief that the railway had to take the bitter along with the sweet, exactly like other public service corporations in Connecticut.

Bus Losses Concern Cincinnati

Increasing losses on several of the coach routes of the Cincinnati Street Railway, Cincinnati, Ohio, have caused the public and city officials much concern, due to the fact that under the "service-at-cost" franchise the loss is made up by the return from railway fares.

These losses are not regarded by the management as being of an alarming nature, but because the situation is looked upon by the public as serious, the management and the city are studying the problem with the view of making the operation of these routes less costly and more profitable.

Walter A. Draper, president of the railway, has prepared an analysis of the situation showing how to reduce the losses. This he is now submitting to Edgar Dow Gilman, Director of Public Utilities, for his consideration and approval.

Permits in Minneapolis

Permits to operate buses on East River Road have been granted by the Park Board at Minneapolis, Minn., to the Northland Transportation Company and the Jefferson Highway Transportation Company. These companies operate also on River Road in St. Paul on a through intercity route, without picking up passengers, and have been doing so for some time, between the Franklin Avenue and Lake Street bridges over the Mississippi River.

This decision will have a bearing on the Terminal Motor Bus Company, which has applied to the Minnesota Railroad and Warehouse Commission for permission to operate bus service between St. Paul and Minneapolis. At present three intercity bus lines are operating, all owned by the Twin City Motor Bus Company, a subsidiary of the Twin City Rapid Transit Company.

It is contended by C. G. Calderwood, the company's president, that residents of the midway district of St. Paul have for years felt the need of more direct transportation facilities, especially for students at the University of Minnesota in Minneapolis.

The Terminal Motor Bus Company is five years old. It operates out of St. Paul to St. Paul Park and to Prescott, Wis., and Durand, Wis., also chartered buses to various points in the United States and Canada. It will install on the new line 26-passenger coaches with parlor seats, heated by hot water. The same fare as other lines will be charged, or 25 cents a trip, but in addition the company proposes a 20-cent commutation ticket rate.

On the other hand the Park Board, Minneapolis, Minn., has granted permission for the Twin City Motor Bus Company to operate a bus line on Cedar Lake Boulevard, supplying service to a district now without transportation of the sort. The route is from the end of the Bryn Mawr car line on Cedar Lake Road, Superior Boulevard, Twenty-second Street and Cedar Lake Boulevard.

The ordinance passed by the Minneapolis Park Board on Nov. 3, 1926, permitting bus companies to operate on parkways and through parks upon payment to a minimum fee of $10 and a maximum of 20 per cent of the state motor vehicle tax for each bus, has been attacked in the district court in a suit by A. S. Dowdall, through Attorney F. W. Booth. The fee money is utilized to maintain and improve city parkways. Default in payment of a bus fee may result in a fine of from $5 to $1,000. It is sought to have the ordinance nullified on the complaint that the ordinance is a public menace and that the rights the board extends to commercial transportation companies are beyond the powers and contrary to the traditions of the Park Board.

Denver Tramway Gets Bus Permit.—The Bus Transportation Company, a subsidiary of the Denver Tramway, Denver, Col., was given a permit on Feb. 16 to operate buses from Englewood, Fort Logan and Loretto Heights Academy. This service is a substitute for the former electric railway, abandoned because it did not pay.

Buses May Replace Cars.—The Yakima Valley Transportation Company, North Yakima, Wash., will probably replace its last street cars with buses as soon as a line of paving is completed along half a mile of streets which the city and county are doing jointly. The two buses now operated on the Yakima streets are said to be very satisfactory.

New Line Starts. — Operation of a bus line between Philadelphia and Doylestown, Pa., was started on Feb. 6 by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. The buses, which run in conjunction with railway service, pass over Old York Road from City Line to Willow Grove and over the Easton Highway from Willow Grove to Doylestown.

Buses Replace Cars.—Permission has been given by the Board of Public Utility Commissioners of New Jersey for the suspension of service on the Sixth and Eighth Streets lines of the Public Service Railway, in Camden, N. J. The board at the same time approved of operation of eleven buses by the Public Service Transportation Company, a railway subsidiary, on the Mount Ephraim route, between Camden and Woodlynne, N. J. The buses will replace the suspended railway service.

Would Operate on White Plains Route.—The Westchester Street Transportation Company, Inc., on Feb. 23 filed petition with the Public Service Commission for an order authorizing the operation of buses on a portion of its route in White Plains. The petition is filed under the provisions of Section 50-A of the Public service commission law. This company is a subsidiary of the Third Avenue Railway System of New York City. It proposes to substitute buses for street cars over a route beginning at the tracks of the New York Central Railroad on Main Street, in White Plains, to the city line and the town of Harrison. A public hearing will be held on this application.

Bus Request Refused.—The Public Service Commission recently dismissed the petition of the Rochester Interurban Bus Company, Inc., for permission to operate bus lines from Rochester, N. Y., to Manitou Beach, Grand View Beach and Island Cottage. Petition for these bus routes was filed on July 24, 1925. Subsequently, the company advised the commission it proposed to have these routes operated by the Rochester Railways Co-Ordinated Bus Lines, Inc., and asked that decision be withheld. Both of these bus companies are owned by the New York State Railways. In January, 1927, the Rochester Railways Co-Ordinated Bus Lines, Inc., filed a petition for these routes and hearing has been held on this petition also. The company agrees that the first petition be refused and the proceeding on the application be closed.

Financial and Corporate

International Claims 10-Cent Fare on Commission Valuation

In a formal statement filed with the Public Service Commission the International Railway, Buffalo, N. Y., asserts that a 10-cent fare would do no more than provide the additional revenue required by the company on the commission's own showing. A Public Service Commission accountant recently reported that the company was earning a fair return, assuming a rate base of approximately $20,000,000, whereas the commission has alowed a rate base of $23,000,000, two of the five members holding that it should be $32,000,000.

On the basis of the commission's own valuation, which is one-third that claimed by the company, I.R.C. fails by $460,000 to earn the return to which it is entitled, says the company's statement.

Decreased employment on the Niagara frontier causes a loss of riding, so that the additional revenue required to give the company a legal return would make a 10-cent fare necessary.

The company's statement alleges many errors in the report of the accountant for the Public Service Commission. It points out that while the subsidiary company, International Bus Corporation, pays International Railway $1,000 a month as rent for Walden Avenue carhouse, and the commission accountant included the rent in income, he deducted a sum set as the value of Walden Avenue carhouse from the rate base. Many items of smaller amount were rejected because the necessity for the expense arose in a previous period. More than $60,000 was deducted covering payment for actual service rendered and expenses incurred.

An item of $10,551 expenses in connection with the investigation of the dynamiting of the high-speed train in 1922 was also deducted by the commission's accountant. The company's statement says:

> There can be no justification for these deductions unless the commission takes the view that the collection and preparation of evidence against lawbreakers attaching the company's property and its patrons is beyond the scope of the company's duty.

Balance Increased on Detroit System

The total operating revenue of the Department of Street Railways at Detroit, Mich., for the year ended Jan. 31, 1927, was $24,713,591, against $23,485,313 for the year ended Jan. 31, 1926. In these figures are included a railway operating revenue and a coach operating revenue of $22,411,611 and $2,301,979, in the 1927 period respectively, against $22,556,758 and $928,554 in 1926. The total revenue from all sources was $24,985,481, against $23,680,745 for the year ended Jan. 31, 1926. Total operating expenses were $19,119,770 in 1927. Of this amount $16,931,548 was for railway expenses and the remainder for coach expenses. The total operating expense for the 1926 period was $17,644,205. Of this amount $16,746,622 was for railway operation and $897,583 for coach operation. Net revenue from all sources totaled $5,865,711 in 1927, against $6,036,539 in 1926. Following the consideration of interest and other deductions a net income of $3,183,299 remained, against $3,389,536 in 1926. The balance for the period was $583,001 in the 1927 period and $570,940 for the year ended Jan. 1, 1926. The railway passengers totaled 481,011,056, against 484,509,830 for the 1926 period. Total coach passengers numbered 29,096,028, against 12,388,021 for the 1926 period. Railway revenue car-miles amounted to 52,419,362, against 53,463,391 and coach revenue coach-miles were 9,410,300, against 4,028,384 for the year ended Jan. 31, 1926.

Fonda Road Protests $1,442,130 Condemnation Figure

Work on the dam to be built in the Sacandaga River at Conklingville, N. Y., will be started within a month, Edward H. Sargent, engineer of the Hudson River regulating board, said on Feb. 21. This is in spite of the intention of the Fonda, Johnstown & Gloversville Railroad to appeal an award of $1,442,130 made on Feb. 19 by a condemnation commission for 7 miles of the railroad's right-of-way along the Sacandaga River near Sacandaga Park.

William J. Maider, acting as attorney for the railroad company, said if the award is confirmed by the court the company will appeal. The railroad company put in a claim for more than $4,000,000.

Within the month the board probably will advertise for bids for relocating the highways and for the big dam itself. The dam will impound 32,000,000 gal. of water and the land will be inundated a distance of 30 miles in length by 3 miles in width.

Income Balance Higher

Washington Company Earns Less than 4 Per Cent on Property Value—Decline of 1 Per Cent in Passenger Traffic

For the year ended Dec. 31, 1926, the balance of income credited to profit and loss of the Washington Railway & Electric Company, Washington, D. C., was $773,200, compared with $644,857 for the preceding year. This fact was disclosed in the annual report of President William F. Ham submitted to the stockholders at the annual meeting on Jan. 15, 1927.

During the year the company's system carried 76,797,163 revenue passengers and 24,272,542 transfer passengers, or a total of 101,069,705 passengers. This is a decrease of 708,473 in the number of revenue passengers carried compared with the previous year, or slightly less than 1 per cent. The primary cause of this continuous loss in traffic is the increase in use of privately owned automobiles, the total now registered in the District of Columbia being 131,362, or 12.6 per cent more than those registered in 1925.

COMPARATIVE STATEMENT OF WASHINGTON RAILWAY & ELECTRIC COMPANY

	1926	1925
Gross earnings from operation	$5,012,619	$4,775,285
Miscellaneous income (including dividends from Potomac Electric Power Company)	1,149,113	1,025,501
Gross income....	$6,161,733	$5,800,786
Operating expenses (including depreciation), taxes and miscellaneous charges	4,140,222	3,915,959
Interest on funded and unfunded debt	688,151	730,600
Payment of dividend on 5 per cent preferred stock.......	425,000	425,000
Payment of dividend on common stock (5 per cent)......	325,000	325,000
	$5,578,374	$5,396,559
Balance of income for year 1926 credited to profit and loss..	583,358	404,227
Miscellaneous items credited to profit and loss	189,841	240,630
Total credited to profit and loss during the year	$773,200	$644,857

The rate of fare in effect on the street cars during 1926 was the same as that in effect since the spring of 1922—that is, 8 cents cash or tickets sold at the rate of six for 40 cents. Notwithstanding considerable improvement being effected in 1926 in all the operating departments of the railway, the results for the year show a return of less than 4 per cent on the value of the property within the District of Columbia as determined by the Public Utilities Commission.

In spite of this the policy of liberal expenditures for maintenance and reconstruction of way and structures was continued in 1926. The amount expended for general maintenance of track and roadway, together with allowances for depreciation, was $904,511. The more important reconstruction projects completed during the year included the rebuilding of 8,175 ft. of underground conduit track and 21,905 ft. of overhead trolley track, at a cost of approximately $312,156. In the summer of 1926 the company placed in operation fifteen modern up-to-date cars, with automatic rear-exit doors and leather-covered de luxe seats. The amount expended for the cars was $235,000, or approximately $15,700 per car. Fifteen new buses were purchased during the year, all of the Yellow Coach type, one with a seating capacity of 21 and the rest with a seating capacity of 29 each, at a total cost of approximately $125,000. These additional buses acquired now bring the fleet to

57 buses, operating over routes with an aggregate mileage of 54.9, representing an investment of $378,938 and all operating as auxiliaries to the railway lines.

The direct cost of operation of buses since they were started in May, 1922, has been $175,916 in excess of the receipts, but the results for the year 1926 are somewhat more encouraging, President Ham said, than at any time since the company entered the field of this form of transportation.

There was a slight increase in the number of accidents compared to 1925 due to added congestion on the streets. Seventy-five per cent of the accidents in 1926 were with automobiles. Aside from the constant alertness of the supervising forces and the operators themselves to guard against accidents, quarterly "Safety" meetings are held throughout the year, where the subject of safe operations is discussed at length. These efforts are productive of results, as demonstrated by the fact that the expenditure for settlements of claims in 1926 was a little more than 3 per cent of the total operating revenues. This is not quite so good a showing as in 1925, but when considering the increase in vehicular movements in 1926 it indicates a degree of co-operation on the part of the employees of the operating departments that is worthy of mention and praise.

The total outstanding bonded indebtedness of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, is now $25,906,900. This amount, added to the $15,000,000 capital stock of the parent company, and $2,002,850 outstanding capital stock of the subsidiary companies, makes the total outstanding capitalization at this time $42,909,750. This excludes bonds purchased for the sinking funds and for temporary investments.

STATEMENT OF PASSENGERS CARRIED BY WASHINGTON RAILWAY & ELECTRIC COMPANY

	Revenue Passengers Carried	Decrease Compared with Previous Year
1919	91,488,735	
1920	87,782,784	3,705,951
1921	85,481,656	2,301,128
1922	82,716,756	2,764,900
1923	81,518,607	1,198,149
1924	77,786,675	3,731,932
1925	77,505,636	281,039
1926	76,797,163	708,473

The total payroll for the year 1926 of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, was $4,794,140, an increase over that of the previous year of $135,112.

The number of employees in the service of the entire system is now 2,943, of whom 2,114 are members of the Washington Railway Relief Association.

Valuation Case to Be Appealed by Washington Company

The United States Supreme Court will be asked to pass on the authority of the Court of Appeals in deducting $5,150,000 from the figures representing the valuation of the properties of the Capital Traction Company, Washington, D. C.

The appellate tribunal was asked on Feb. 17 by Attorney George E. Hamilton and G. Thomas Dunlop to stay its mandate long enough for the company to apply to the highest court for a writ of review. A request of this sort is usually granted, especially when important questions and large figures are involved.

On Feb. 7 the Appellate Court fixed the value of the company's properties, for rate-making purposes at $25,756,880, or the sum of $5,150,000 less than the figure arrived at by the lower court. The sum of $5,150,000 was added by the lower court as the amount representing the cost of the franchise and good will of the old Washington & Georgetown Railroad in 1895. This road, when merged with the old Rock Creek line, became the present Capital Traction Company.

Conspectus of Indexes for February, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Feb. 1927 **7.45**	Jan. 1927 **7.42**	Feb. 1926 **7.35**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Feb. 1927 **154.0**	Jan. 1927 **156.0**	Feb. 1926 **155.3**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	Feb. 1927 **226.7**	Jan. 1927 **226.6**	Feb. 1926 **223.8**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Feb. 1927 **202.9**	Jan. 1927 **203.5**	Feb. 1926 **201 9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Feb. 1927 **210.2**	Jan. 1927 **211.5**	Feb. 1926 **206.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Jan. 1927 **146.9**	Dec. 1926 **147.2**	Jan. 1926 **156.0**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Feb. 1 1927 **12.52**	Jan. 1 1927 **12.82**	Feb. 1 1926 **13.72**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Jan. 1927 **159.3**	Dec. 1926 **161.8**	Jan. 1926 **164.3**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Jan. 1927 **166.9**	Dec. 1926 **168.4**	Jan. 1926 **170.4**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Jan. 31 1927 **3.800**	Dec. 31 1926 **3.961**	Jan. 31 1926 **4.883**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Jan. 1927 **18.89**	Dec. 1926 **19.76**	Jan. 1926 **19.79**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Jan. 1927 **2227** **75.06**	Dec. 1926 **1979** **91.88**	Jan. 1926 **2083** **52.36**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Refinancing of Dayton & Western Completed

Refinancing of the Dayton & Western Traction Company, handed back to its original owners when there was a dissolution of the merged Ohio Electric System, has just been completed by stockholders. This includes the payment of outstanding obligations through the issuance of $312,500 in coupon bonds, bearing 5 per cent interest. The Winters National Bank is made trustee. A first mortgage on the property and all equipment, along with a deed of trust, was filed by President Valentine Winters.

International Railway Reports Small Net Income

The yearly income account of the International Railway, Buffalo, N. Y., shows a net income of $48,610 for 1926, compared with a deficit of $210,355 for the year 1925. This is the first time in nine years that the company's receipts have exceeded expenses. For nine years no dividends have been paid to stockholders, who, according to President Bernard J. Yungbluth, have contributed in cash during this period for the maintenance of service $4,140,445. During the same period more than $5,000,000 has been paid to the various municipalities served by the company.

INCOME ACCOUNT OF INTERNATIONAL RAILWAY

	1926	1925
Operating revenue..........	$10,650,372	$10,695,695
Operation and taxes..........	9,193,277	9,408,102
Operating income..........	$1,457,095	$1,287,593
Non-operating income..........	49,799	48,094
Gross income..........	$1,506,894	$1,335,687
Income deductions..........	1,458,284	1,546,042
Net income..........	$48,610	*$210,355

*Indicates deficit.

The company is now faced with demands for track and paving reconstruction in each of the municipalities served, totaling in Buffalo alone more than $2,000,000. This paving is within the tracks and 2 ft. outside, and constitutes 55 per cent of the total width of the street. The railway has contended that this cost is the result of antiquated laws, making the car rider responsible for paving, notwithstanding the fact that street cars are the only vehicles on the streets that do not use the paving.

Applications for higher fares to meet these costs and to provide the legal return to stockholders are now pending before the Public Service Commission and the federal courts.

The accompanying statement shows the results of 1926 compared with 1925.

$2,500,000 of Notes of Baltimore Company Offered

The United Railways & Electric Company, Baltimore, Md., has sold to Alexander Brown & Sons $2,500,000 of three-year notes of the company. They are to be dated March 1, 1927, due March 1, 1930, and bear 6 per cent interest. They were offered on Feb. 23 to banks and other investors at 99¼ and interest to yield about 6.28 per cent. The Safe Deposit & Trust Company of Baltimore is trustee. Proceeds of the sale are to be used to refund company notes which mature on Aug. 1, 1927, and preference in allotments on subscription to the notes now offered will be given to those who agree before the subscription books are closed to make payments for the new notes with the old notes at par and interest.

Directors Elected at Worcester—New Cars and More Buses

Seven new directors were added to the board and two of the old board resigned at the annual organization meeting of the Worcester Consolidated Street Railway, Worcester, Mass., on Feb. 23, the first meeting since the New York, New Haven & Hartford Railroad resumed ownership of the property. Henry C. Page, general manager, and Leverett Candee, treasurer, resigned as directors. Arthur P. Russell, one of the new directors and a vice-president of the New Haven, was elected vice-president to fill the vacancy caused by the death a few months ago of Col. George Bullock.

The new directors are: John E. White, president of the Worcester Bank & Trust Company and president of the Worcester Chamber of Commerce; Forrest W. Taylor, T. Hovey Gage and Harry W. Goddard, all of Worcester; E. G. Pearson, president of the New Haven; E. G. Buckland, vice-president of the New Haven, and Mr. Russell. The following directors were re-elected: Charles M. Rogerson and W. E. McGregor, Boston; Charles E. Ware, Fitchburg; Clark V. Wood, Springfield; Francis H. Dewey, Worcester.

The officers of the corporation are: President, Clark V. Wood; vice-president, Arthur P. Russell; secretary, William F. Crowe; chairman, Francis H. Dewey.

President Wood, in discussing plans for the future of the road under the management of the New York, New Haven & Hartford Railroad, said recently:

> I believe that when the new cars are placed in service the patronage on all the lines will be increased and that the losses noted during 1926 will not be so large this year. We plan to increase the number of buses. This will lessen our operating expenses. Our profits in 1927 should be larger than in 1926.

Mr. Wood stated that plans for new cars were in the hands of officials of the railroad and that bids will be requested soon. The number of buses also will be increased. Several electric lines will be discontinued in favor of bus service. Mr. Wood said there were several lines in Worcester which could be taken care of by buses. There may also be many changes in schedules to serve the patrons better.

As further evidence that the rehabilitation program is already being followed, Mr. Wood stated that plans are being drawn by the Henry R. Kent Company, Rutherford, N. J., for a new carhouse and for a garage for the buses which the company operates. Many of the cars now being operated will be overhauled and others, in service a long time, will be junked.

Abandonment of Mesaba Railway Sought

Hearing on a petition for permission to abandon operation of the Mesaba Railway, Virginia, Minn., was set to take place in district federal court at Duluth on Feb. 23, under an order signed by Federal Judge John B. Sanborn and made public on Feb. 14 by James C. Chestnut, a receiver of the railway.

The petition, seeking authority to abandon the operation of the line and to dismantle and dispose of the property, was made by Mr. Chestnut and Oscar Mitchell, receivers. The line has been operating at a loss for a number of years, according to the receivers. If authority is granted, the line will probably be abandoned about April 19. The company operates 40 miles of line.

Denver & Interurban Railway Sold

The Denver & Interurban Railway, Denver, Col., which operates an electric railway from Denver to nearby northwestern points, was sold on Feb. 17 at auction by the federal court for $88,850. The road will be dismantled. The sale was at the instigation of the Guaranty Trust Company, New York, which is trustee under the first mortgage bonds for $1,078,000.

Increase In Net Income.—For the seven-month period ending Jan. 31, 1927, the total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $27,177,699, against $26,142,270 for the period ending Jan. 31, 1926. Total operating expenses increased from $17,008,778 to $17,525,563 in 1927. Following the consideration of income deductions there was a net income of $3,752,623 for the seven-month period ended Jan. 31, 1927, against $3,378,057 for the same period of the year previous.

Loss in Schenectady Larger.—The Schenectady Railway, Schenectady, N. Y., reports to the New York State Public Service Commission for the quarter ended Dec. 31, 1926, a net loss of $291,397 after fixed charges, compared with a net loss of $10,851 in the corresponding period of 1925.

New Directors Named in St. Louis.—Two new directors for the United Railways, St. Louis, Mo., were named at the annual meeting of the stockholders on Feb. 8. Walter W. Smith, vice-president of the First National Bank in St. Louis, and Herman C. Stifel, broker, replaced A. Siegel, who died recently, and A. C. Brown, who declined re-election.

Net Corporate Income Lower.—For the six months period ended Dec. 31, 1926, the passenger revenue on the Brooklyn City Railroad, Brooklyn, N. Y., was $5,677,845, against $5,688,734 for a similar period the year previous. Operating expenses and taxes increased from $4,852,726 to $4,900,749 in 1926. After the consideration of income deductions there was a net corporate income of $624,466 for the 1926 period, against $721,516 for the period ended Dec. 31, 1925.

Would Increase Stock Shares.—The Indiana Service Corporation, Fort Wayne, Ind., in a petition just filed with the Indiana Public Service Commission, has asked to increase by 30,500 the number of shares of its preferred stock and by 200,000 the common stock shares in order to reimburse the company for betterments and extensions for 1926 and those planned for 1927. The petition states that the present authorized stock is 40,000 shares of preferred with a par value of $100 and 500,000 shares of common.

Discontinuance Threatened. — Employees of the Peterboro Radial Railway, Peterboro, Ont., Canada, have been notified that the service may be discontinued after April 1. The notice from the management, the Hydro-Electric Power Commission, was posted in the power house. It is said that the intimation of the possible abandonment of the system is the result of higher power rates in Central Ontario.

Lease Extended.—The Capital Traction Company, Washington, D. C., on Feb. 18 announced it had extended for six months its lease with the Washington-Maryland Railroad on the latter corporation's line from Fourteenth and Kennedy Streets northwest to Takoma Park, Md. Negotiations are pending for purchase of the line by the Capital Traction Company, but there has been disagreement over the terms of transfer. The present lease expired on Feb. 20 and the extension is for the purpose of permitting further negotiations.

Will Hear Abandonment Plea.—Hearing on the application of the Lake Shore Electric Railway to abandon its line between Sandusky and Norwalk, Ohio, will be held on March 3, before the Public Utilities Commission of Ohio. The railway points out that there was a decrease in receipts from $65,045 in 1920 to $17,616 the first eight months of 1926. During the entire time the expenses have exceeded the gross revenue. The deficit of this division from Jan. 1, 1920, to Aug. 31, 1926, is placed at $74,618. The company has paid $30,500 in taxes on this property. It points out that the territory covered by this division is not thickly populated, and that transportation needs will be fully cared for before the establishment of a bus line between Sandusky and Norwalk, as proposed by the Lake Shore Motor Coach Company, a subsidiary organized by the railway.

Personal Items

H. R. Whitney in Worcester

Operating Vice-President of Massachusetts Road Enters Upon His New Duties

Howard R. Whitney, recently named operating vice-president of the Worcester Consolidated Street Railway, Worcester, Mass., has begun his duties in that city and already a start has been made on the rehabilitation program planned for that road by the New York, New Haven & Hartford Railroad, which has again come into possession of the line.

Mr. Whitney has been associated with railroading, both steam and electric, for the past twenty years and his various connections have taken him all over the United States. Equipped with a mind that has shown ability to grapple with major problems, he has been called upon to supervise some of the most important transportation questions that have come up for consideration in various places.

Mr. Whitney is essentially an engineer, both by professional training and bent of talent and mind. He rejoices in working out problems that present obstacles. Quiet and unassuming, he studies his problems, finds the solution and then moves to put his ideas into effect. It is these qualities that have led to his consistent advancement in connection with the Springfield and the Worcester railways.

He became affiliated with electric railways in 1914 after he had accumulated a wealth of valuable engineering experience in the transportation field in the West. His first job with the electric railways operating in the cities of Worcester and Springfield was engineer of maintenance of way, and the thoroughness with which he did his work soon attracted the attention of his superiors. It was not long before his engineering responsibilities were increased. The augmented work acted as an incentive to spur him to greater effort and industry, and the reward in the form of an appointment as a special assistant to Clark V. Wood, the president, was the result. In this position, his ability to accomplish things and his talent for solving vexing problems came under official eyes in a more intimate way and he was made a vice-president of the railways.

Mr. Whitney got the railroad fever almost as soon as he had finished his college course in 1905. He was born in Boston, educated in the grammar schools and the English high school of that city and then entered Tufts College. He matriculated in 1905, returned to the college to teach mathematics for a time and then got his first chance in the field of endeavor which was to be his life work.

G. M. Thompson, a consulting engineer of Boston, much impressed with the enthusiasm and industry of young Whitney, employed him on various projects which his firm was handling. In this way Mr. Whitney had the good fortune to come under counsel and advice that was to stand him in good stead in his future railroading activities. He helped in surveying for a projected electric railway from Fitchburg, Mass., to Boston, Mass., and in working out plans for the elimination of grade crossings on the Boston, Revere Beach & Lynn Railroad and for the four-tracking of the road. Early in his career he virtually built the branch of the Lowell & Fitchburg Street Railway that runs from North Chelmsford to Westford.

The year 1907 found him with the Missouri Pacific engineering force in St. Louis as assistant on the engineering corps, a position which could not have been more humble. But here again his talents were manifest and in rapid order he passed through the various grades of assistant engineer, resident engineer on construction and acting division engineer. Finally he became acting division engineer of the important central division with headquarters in Van Buren, Ark.

H. R. Whitney

But the East called to Mr. Whitney. His home ties and his boyhood memories were in that part of the country and he returned to New England as resident engineer of the Grand Trunk Railway with headquarters in Woonsocket, R. I. From the Grand Trunk Mr. Whitney went to the Boston & Maine Railroad as assistant engineer and then as resident engineer. Then he ventured into business for himself, becoming actively affiliated with a contracting firm in Nashua, N. H., which handled many big engineering jobs in New England.

His affiliation with the electric railways at Springfield and Worcester followed and he has been connected with them since. He has an attractive personality and has the ability to make employees work with him. The manner in which he has begun his work in Worcester is typical of the man. He has shown a disposition to get at the bottom of things, to scrutinize conditions carefully and be fully informed before going ahead. Once he has gained the knowledge he desires there is no hesitancy in his decisions or determination. Mr. Whitney was not constrained to talk about his work, but he did consent to go on record to this effect:

> The big job of a public transportation company is to furnish adequate and satisfactory transportation, to satisfy the public as far as can reasonably be expected and profit from the good will which is bound to come from a public that knows you are trying to serve it.

Lachlan Mackinnon Succeeds Mr. Dalrymple

Lachlan Mackinnon, hitherto deputy manager of the Glasgow Corporation Tramways, Glasgow, Scotland, has been made general manager in succession to James Dalrymple, retired. He was selected by the corporation for the post by a vote of 54 to 23, following a recommendation by the tramway committee. No other name was suggested, but the minority, consisting largely of Socialists, contended that the vacancy should be advertised. Bailie Burt, chairman of tramways committee, pointed out that London was the only center in which the city could hope to find a man with tramway experience equal to that of Mr. Mackinnon. All other administrators capable of filling the position were associated with undertakings smaller than that of Glasgow. He was satisfied that Mr. Mackinnon was the best man the corporation could select, for he was admirably qualified by experience, personality and local knowledge to succeed Mr. Dalrymple.

Changes on Interstate Property

Charles D. Hardin, Seymour, Ind., who has been acting traffic manager for the Interstate Public Service Company, Indianapolis, Ind., since the death of Bert Weedon, several months ago, has been appointed to the position. Mr. Hardin has been connected with the company for a number of years.

L. D. Halstead, Louisville, Ky., has been appointed general agent for the Interstate Public Service Company to succeed C. D. Hardin. He has moved to Seymour, Ind., to take up his new work.

Harry Bullen of Detroit Resigns

Harry Bullen has resigned as general superintendent of the Detroit United Railway, Detroit, Mich., effective Feb. 1, after being with the company for nearly 40 years. At the time of his resignation he was the oldest officer of the company in point of length of service.

He started work in Detroit in 1888 following construction of the old Citizens' Company lines. His rise included promotions from dispatcher to assistant division superintendent, division superintendent, assistant general superintendent and general superintendent in turn. Since Jan. 1, 1904, he has been general superintendent of all the city and interurban properties of the Detroit United Railway.

Mr. Bullen was born in England in 1864, and when he was six years old his parents moved to Toronto, Ont. He was associated with Albert Stanley, now Lord Ashfield, head of the London underground system, when Lord Ashfield was connected with the Detroit United Railway and is a close personal friend of the head of the London system.

Mr. Bullen plans to divide his time between California and his cottage and hunting lodge in Michigan.

Changes in Title in Montreal

Alfred S. Byrd has had his title changed to superintendent, power department, Montreal Tramways, Montreal, Canada. He was previously superintendent of power plants, including the power houses, substations and power distribution.

William M. Bolan, who was assisting Mr. Byrd, but without a title, was appointed assistant superintendent, power department.

Promotions Announced on Pacific Electric System

Due to the death of W. C. White, late superintendent of the Western division, Pacific Electric Railway, Los Angeles, Cal., and H. C. Ward, trainmaster, Southern division, changes in the staff of the transportation department have been put into effect.

O. P. Davis, superintendent of the Southern division since 1913, has been transferred to the Western division post vacated by the death of Mr. White. Mr. Davis has had long experience as an operating officer.

Edwin Clark, formerly assistant superintendent of the Southern division, has been selected to fill the post vacated by the transfer of Mr. Davis. Mr. Clark began service with the Pacific Electric Railway as a conductor in June, 1903, and successively was promoted and served as switchman, dispatcher, chief dispatcher, carhouse foreman, trainmaster, and assistant superintendent of the Northern, Western and Southern divisions.

S. H. Cox, previously assistant trainmaster, succeeds Mr. Ward as trainmaster, Southern division. Mr. Cox entered the service of the company as passenger conductor in December, 1913, later serving as motorman, freight switching foreman, dispatcher and assistant trainmaster.

S. H. Hand, formerly supervisor, was appointed to succeed Mr. Cox as assistant trainmaster. He entered the service in August, 1912, as a motorman, Southern division, and in 1920 was appointed supervisor, which position he held until his present appointment.

A newly-created position—terminal trainmaster, Southern division—was given to E. B. Whiteside. This position involves jurisdiction over the division's freight service and within the switching limits of the Santa Monica Air Line. Mr. Whiteside entered the service of the Los Angeles & Redondo Railway as timekeeper in August, 1906, serving successfully as assistant agent in Redondo, wharfmaster, assistant trainmaster and trainmaster (freight.)

J. G. Blake was named as the successor of Mr. Whiteside, formerly trainmaster, Southern division. Mr. Blake also is a veteran, having entered the service of the company as a motorman in December, 1911, successively having served as freight conductor, terminal foreman and assistant trainmaster, until his present appointment as trainmaster of the division.

The post vacated by Mr. Blake was filled with the appointment of F. O. Bradley as assistant trainmaster. Mr. Bradley entered the employ of the company as car clerk, Los Angeles yards, in April, 1912, which post he filled until September, 1919. He later was employed as freight conductor.

G. J. Kerwin Chief Adjuster at Grand Rapids

George J. Kerwin has been appointed new chief adjuster Grand Rapids Railway, Grand Rapids, Mich., to succeed the late F. M. Webster. Announcement to this effect is made by L. J. DeLamarter, vice-president and general manager. Mr. Kerwin is known in the industry as a very capable adjuster. He began his service with the Grand Rapids Railway in June, 1905, in the adjustment department and for many years was assistant to Mr. Webster.

G. J. Kerwin

Changes in Dayton

At the stockholders' meeting of the City Railway, Dayton, Ohio, on Feb. 10 George G. Shaw was elected president, succeeding J. M. Markham. R. K. Landis was elected secretary, replacing W. S. W. Edgar in that capacity.

D. H. Goodwillie Reappointed to Toledo Board

David H. Goodwillie has been reappointed a member of the Board of Street Railway Control at Toledo. Mr. Goodwillie has just completed a two-year term as chairman of the board. He has served the entire six years since the Milner ordinance became effective. Under the rotation plan adopted by the board Henry C. Truesdall, vice-president of the Toledo Trust Company, has been named chairman and W. W. Knight of the Bostwick-Braun Company becomes secretary.

W. N. Albertson Heads New Holding Company

Walter N. Albertson, Milwaukee, has been chosen president and general manager of the $10,000,000 holding company formed in Omaha to operate public utility properties in Iowa, Nebraska, Minnesota, North and South Dakota to be known as the Central West Public Service Company, Inc. Mr. Albertson is president of W. N. Albertson & Company, Milwaukee, public utility engineers and president of the reorganized Central West Public Service Company. He expects to move from Milwaukee to Omaha soon to establish headquarters of the new enterprise there.

George N. Kalweit, formerly general auditor of the Milwaukee Electric Railway & Light Company, who held the post of vice-president and treasurer of the old Central West Public Service Company, will continue in that capacity with the new holding company.

Homer B. Carter, Sioux City, Iowa, has been appointed general counsel; R. C. Hill, Milwaukee, operating engineer; E. T. Sadler, Milwaukee, auditor, and J. F. Bailey, Jamestown, N. D., construction engineer.

Ezra Brainerd Confirmed as Commerce Commissioner

President Coolidge's nomination of Ezra Brainerd, Jr., of Oklahoma to the Interstate Commerce Commission has been confirmed by the Senate. Mr. Brainerd is a New Englander, the son of the late Ezra Brainerd. He is a lawyer and vice-president of the oldest bank in Oklahoma. He was graduated from Colgate University and the University of Michigan Law School.

P. Leroy Harwood, New London, was recently elected treasurer of the Groton & Stonington Traction Company, Mystic, Conn., following a reorganization of the company. He replaces E. A. Harris.

L. C. Lemon, present assistant general manager of the Tri-City Railway of Iowa and of the Clinton, Davenport & Muscatine Interurban Railway, Davenport, Iowa, has been given the additional duties of assistant general manager of the Tri-City Railway of Illinois. This change was made in connection with the promotions previously announced by the company following the assignment of T. C. Roderick to the post of general manager of the Ottumwa Gas Company, Ottumwa.

R. M. Vaughan, engineer with the California Railroad Commission for the last twelve years and valuation engineer for the last six years, resigned that position to become associated with the H. M. Byllesby Company of Chicago. Mr. Vaughan completed his electrical engineering course at the University of Missouri in 1903, and since that time has been actively engaged in engineering in Chicago and on the Pacific Coast, having been associated with Bion J. Arnold, Stone & Webster, J. G. White & Company, Puget Sound Power & Light Company and British Columbia Electric Railway.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Public Service Orders 212 New Buses

Public Service Transportation Company, Newark, N. J., a subsidiary of Public Service Corporation of New Jersey, has placed orders for 147 buses with the Mack International Motor Truck Corporation and for 65 buses with the American Car & Foundry Motors Company, according to an official announcement made Feb. 24 by John L. O'Toole, vice-president in charge of public relations.

Forty of the Mack buses will be of the gas-mechanical type, 70 of the gas-electric type, with four-cylinder engines and one electric motor, and 37 will have six-cylinder engines and one motor. The electric equipment of the 107 gas-electric buses will be manufactured by the General Electric Company.

The 65 A.C.F. buses will have six-cylinder engines, driven by two electric motors. The electric equipment will be manufactured by the Westinghouse Electric & Manufacturing Company. Bodies for all of the 65 buses are to be constructed by the company in its own shops. They will be equipped with air brakes manufactured by the Westinghouse Traction Brake Company.

The new orders will bring the company's new equipment up to 953, of which 567 will be gas-electric and 386 gas-mechanical type.

Cincinnati, Hamilton & Dayton Acquires New Carhouse

Involving an expenditure of upward of $500,000, the Cincinnati, Hamilton & Dayton Railway has purchased the buildings of the Smith Gas & Engineering Company at Morraine City, Ohio, which will be converted into carhouses and modern shops.

Purchase of the plant is part of the $1,500,000 program of reconstruction and rehabilitation recently launched by the company. The property, acquired early in February, consists of one large concrete, brick, steel and glass building, 422 ft. x 111 ft., and another structure 160 ft. x 101 ft. They are located on a 7.9-acre lot on the west side of the Springboro Pike.

In connection with the sale, 1.23 acres was purchased from the Morraine Development Company on the east side of the pike in order to provide space for the track layout. In addition to providing for the comfort of workmen and the housing of the supervisors, the new plant will contain a modern shop, all machinery to be operated by electricity. At the new plant also will be located the general offices of the company, which will be removed from the National Bank Building in Dayton.

Migration Ill-Adjusted to Business Cycles

The flow of human tide that sweeps into the United States in boom times and out during depressions is not well timed with the fluctuations in employment opportunities, the lag varying from a few months to one year, according to a report entitled "Migration and Business Cycles," just completed by the National Bureau of Economic Research.

The report, prepared by Dr. Harry Jerome, contains the findings of an investigation intended primarily to deal with the shortage and surplus of labor in the United States and it is the first of what is to be a comprehensive series dealing with the general effects of migration upon the economic activities of the nation.

In general contour, the curves showing the fluctuations in male immigration and factory employment in the period from 1890 to the outbreak of the great war bear a marked resemblance, according to Dr. Jerome, who points out, however, that "when the two curves are closely examined to determine the extent to which the major turns in the two curves coincide, it appears that they agree most closely when it is assumed that the fluctuations in immigration lag from two to four months after the corresponding fluctuations in the employment curve."

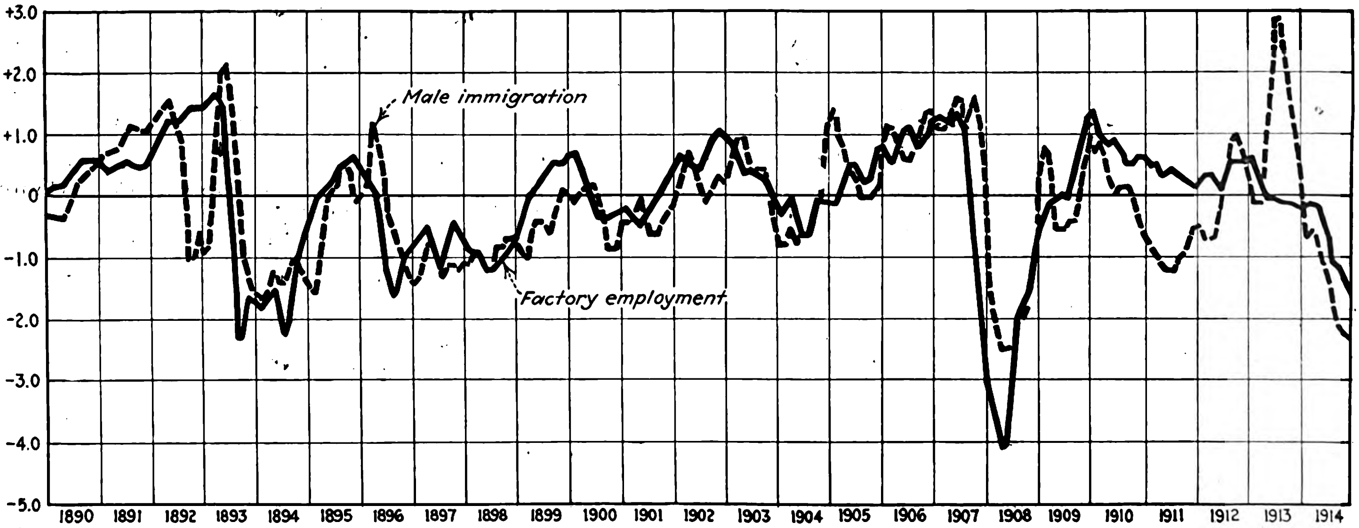
Regarding the sensitiveness of migration to business conditions, Dr. Jerome observes:

"A comparison of data pertaining to male immigration, pig iron production and factory employment in the pre-war period reveals the fact that cyclical fluctuations in male immigration are ordinarily associated with prior changes in the same direction in production and employment. The influence of a major cyclical change in industrial conditions is usually apparent in immigration within less than half a year. The cyclical movements in emigration are inversely correlated with those of immigration and employment with large emigration in depression periods and relatively small emigration in boom periods.

"The fluctuations of 'net immigration' exhibit a high degree of sensitiveness to employment conditions in the United States. This is evident when immigration and emigration are jointly considered either in terms of the ratio of emigration to immigration or in terms of the numerical excess of arrivals over departures or of departures over arrivals."

The pre-war period is more significant for the investigator's purposes, because there were at that time, on this side of the Atlantic at least, fewer legal or unusual barriers to the free flow of migration in accordance with the pull of economic motives.

During the war ordinary migratory movements were hindered by the hazards of ocean travel, the restraints placed upon their nationals by the belligerent countries and similar obstacles to the normal movement of migrants.



Courtesy National Bureau of Economic Research.

Curves of Factory Employment and Immigration 1890-1914

"Yet we must not conclude that there were no migratory movements actuated by economic motives in this period," Dr. Jerome warns. "Prior to our entry into the war a considerable fraction of the usual flow continued from neutral countries and even from the allied countries and the number of 'immigrants' recorded from British North America increased, exceeding 100,000 in each of the fiscal years 1915-16 and 1916-17. The numbers from Mexico also increased, particularly if we include those admitted during and immediately following the war period by special provision waiving the literacy test and admitting for temporary conditional sojourn to help meet the demand for labor.

"On the return of transportation to something akin to normal conditions, thousands of foreign-born residents of the United States who had been forced by war conditions to postpone a trip to their former home sailed for Europe. Among these were many returning because of changed political conditions. For example, in the three fiscal years 1920, 1921 and 1922 the emigrant aliens destined to reconstituted Poland numbered more than 90,000, most of them of the Polish race.

"Immigration, likewise, was somewhat slow to recover, not quite reaching the 250,000 mark in 1919 (calendar year). The incoming movement, however, exhibited a growing momentum and reached a total of more than 700,000 in the calendar year 1920, not including non-immigrants and even in 1921, despite industrial depression, did not drop below 50,000 per month until June, 1921, by which time the 3 per centum quota law had gone into effect.

"This law was apparently due, in part at least, to the fear that the volume of immigration in 1920 was but an indication of the growing momentum of a flood of immigrants which had been dammed up by war conditions and which now, spurred by actual or impending economic and political chaos in Europe, threatened to inundate this country with an unprecedented volume of aliens.

ECONOMIST'S PROBLEM MORE DIFFICULT

"Whatever the facts may be concerning the probability of the expected inundation, steps were taken in the law of May, 1921, which make the disentanglement of the economic trends in the subsequent period more than usually difficult. Because the quotas began to be available in July, and 20 per cent of the quota of any country could be admitted in a single month, the law has tended to concentrate the arrivals in the second half of the calendar year, thus creating a seasonal movement materially different from that characteristic of the pre-war period and obscuring the effects of industrial prosperity and depression except for those countries which were obviously falling short of the quota or, like Canada and Mexico, were not subject to the law.

"Since 1921 emigration has been consistently low, not only because of the industrial recovery from the depression conditions of 1921-22, but also because of the fact that the restriction of the incoming flow and the fear of those who are here that they may be unable to return readily if they once leave, combined with the deterring effect of unsettled political conditions and industrial depression in European countries, have kept emigration to a minimum.

MOVEMENT FROM CANADA

"The post-war movement of immigration from Canada is of special interest because the 1921 quota law did not apply to natives of Canada or to persons born in other countries who had resided there for five years.

"Leaving out of consideration citizens and non-immigrants and including only the 'immigrant alien' group, the immigration in calendar years from Canada and Newfoundland to the United States is recorded as follows:

IMMIGRATION FROM CANADA

1919	81,179
1920	85,249
1921	52,929
1922	63,089
1923	182,369

"When adjusted for typical seasonal variation, the curve of immigration from Canada exhibits a substantial decline during the greater part of 1921; in fact, through most of 1920 a slight tendency to decline is evidenced in immigration from Canada, though the general movement of immigration from all countries is still on the up-grade, suggesting that the decline in industrial activity in the United States affected immigration from Canada more quickly than from Europe.

"That the wage-earning element in migration is most susceptible to depressions in this country may be illustrated by the fact that in severe depression years the ratio of laborers (farm laborers plus general laborers) to total immigration decreases, while the 'no occupation' group becomes a larger fraction of the total. The fiscal years 1904, 1908, 1911, 1914 and 1922 correspond with industrial depressions, and in each one of these years the 'laborers' group, in terms of percentages of the total, decreases relatively and the 'no occupation' group increases."

Canadian Car Company Slated for Montreal Car Order

According to latest reports from Montreal, the order for the 50 new cars required by the Montreal Tramways will be placed with the Canadian Car & Foundry Company in the near future. Definite decision on a few details of construction is the only thing delaying the official issuance of the order.

It is understood the contract will cover 25 motor and 25 trail cars, to be operated as two-car trains. As the approximate cost of the cars is around $17,000 each, the total amount of the contract will run in the neighborhood of $850,000. Delivery is scheduled to commence during the fall, which will give the car company the summer months in which to complete construction.

The addition of this order to the business already booked since the beginning of the year gives the Canadian Car Company around $10,000,000 worth of work with only two months of 1927 having passed. The carry over from last year amounted to $1,800,000. Taking into account the passenger and freight car orders totaling $5,000,000, approximately $1,000,000 for steel castings and specialties to be supplied to other car building plants, the present street car order, at $850,000, and some small business from the C.P.R. amounting to about $100,000, the total is $8,750,000.

Other miscellaneous business, including springs, switch and trackwork, should bring this up to the $10,000,000 mark, which is in excess of the total business handled in any year since 1924.

Worcester Consolidated Uses 500 Tons of Salt

Worcester Consolidated Street Railway recently gave the citizens of Worcester, Mass., an insight into some expenses which it must meet that are not generally known. In response to the inquiry of the city editor of a local newspaper, the company revealed that it expends about $5,000 a year for salt, which is used in winter to keep switches open. Officials of the road estimate that they use about 500 tons of salt a year at an average cost of $9.50 a ton.

Start Work on Wilkes-Barre Shops March 1

Work on a new quarter of a million dollar car shop for the Wilkes-Barre Railway Company will be started at Wilkes-Barre, Pa., on March 1 by the H. K. Ferguson Company, engineer and builder of Cleveland, which has been awarded the general contract. The car repair shops and machine shops will be completed by the middle of July, according to provisions of the contract.

Percy Owen Heads Brake Materials Corporation

The American Brake Shoe & Foundry Company, New York, announces that its new subsidiary company, American Brake Materials Corporation, which will manufacture and sell American "brakebloks," with main offices and factory in Detroit, will be under the presidency of Percy Owen, for years prominently connected with the automotive industry. Other officers are largely leading officials of the American Brake Shoe & Foundry Company.

The manufacture of American "brakebloks" is the result of years of study on the part of the American Brake Shoe & Foundry Company, to find a method whereby the railroad principles of braking may be applied not only to automotive vehicles but also to all industrial uses where long life and the elimination of replacement are essentials.

The problem was to evolve a material which should be so hard as to be practically non-wearing, thus largely eliminating replacement, and yet of a character which would not score brake drums; which would be so effective that it could be placed in segments, rather than in a continuous unit, thus allowing the dissipation of heat as well as the dissipation of destroyed surface material which would otherwise invalidate the friction surface. The company says of the new product:

> After a great deal of research and experimentation, a material was invented which has the hardness of 35 carbon steel, but which will not score brake drums, which is not readily conductive of heat, which acts equally well even when drenched with oil or water, which does not squeal and which is of such durability as to outwear by three or four times all previous friction materials developed.
>
> It will be seen, therefore, that the invention of this material makes possible an entirely new system of automotive braking, which will of course at first be of particular interest to bus and truck manufacturers and manufacturers of passenger cars who wish to equip their vehicles with the ultimate in safety, eliminating at the same time for the car user the necessity for frequent replacements, with resultant loss of vehicle use.

The company is arranging for production at its factory in Detroit to supply some of the largest manufacturers of buses and trucks with American "brakebloks" for utilization in their braking systems.

B.-M. T. Equipping New Triplex Cars

Work has been begun by the Brooklyn-Manhattan Transit Corporation in its new Coney Island shops on equipment of the first of the 67 new triplex cars ordered about a year ago from the Pressed Steel Car Company and delivered two weeks ago. Mechanics commenced equipping this three-car unit early last week. The single car now undergoing completion is the first triplex unit of the original group purchased by the B.-M. T. Within a week five more of the 67 are expected to reach Brooklyn, and ten days later regular deliveries of two or three a week are expected.

Rolling Stock

Lorain Street Railroad, Lorain, Ohio, is reported as a possible purchaser of new street cars and other equipment. Engineers and traction experts are now making an investigation to determine the type of cars and kind of equipment which can be used most successfully, according to Martin Ackerman, general manager of the Lake Shore Electric Railway, the parent company.

Stark Electric Railroad, Alliance, Ohio, has purchased three one-man cars from the Boston Elevated Railway, Boston, Mass. One car is in service, while the others are en route. The equipment thus secured will replace three cars borrowed from the Northern Ohio Power Company, when one-man service was adopted for Alliance city service several months ago. The Northern Ohio Power cars are to be returned.

Track and Line

Worcester Consolidated Street Railway, Worcester, Mass., has filed three petitions for track changes with the city authorities growing out of the city's assent to the act authorizing the New York, New Haven & Hartford Railroad to resume control of the trolley property. The first petition seeks authority to lay a single track through Commercial Street from Foster to Front Street. A second petition asks permission to add a second track on Foster Street from Main to Commercial Streets. A connection for the proposed double-track line on Foster Street with the Summer Street tracks is covered by the third petition recently filed.

Pacific Electric Railway, Los Angeles, Cal., has approved more than $650,000 worth of roadbed improvement for attention by engineering department forces at various points on the system. The work, for the most part, involves replacement of worn trackage to the amount of approximately 15 miles, with 90 and 128-lb. rail and fittings. In addition, the work of constructing temporary shoofly track is now under way, preparatory to the construction of the Pico Boulevard grade separation on the West Sixteenth Street line at Vineyard Junction.

Power Houses, Shops and Buildings

Worcester Consolidated Street Railway, Worcester, Mass., has taken the first steps toward the erection of a new carhouse in the parking space which it has used for car storage on Grove Street in that city. Henry R. Kent & Company of New York, engineers, have been engaged to study the possibilities of the site not only from the operating carhouse point of view but from that of the garage facilities as well. If the plans of the company are followed the carhouse will be used for minor repairs and the yard facilities employed for storage. The Market Street carhouse, which is located nearer the center of the city, will then be overhauled and used only for major repairs to cars. The proposed new carehouse will be 200 ft. x 190 ft., of brick construction, and will have a capacity of about 40 cars. There will be a starter's office, a lobby for the men, stock room, repair shop and car washing room.

Trade Notes

Hill Clutch Machine & Foundry Company, Cleveland, Ohio, recently appointed Charles C. Phelps, 473 Getty Avenue, Paterson, N. J., as sales engineer for the metropolitan New York and northern New Jersey district. The Hill Clutch Machine & Foundry Company manufactures everything for power transmission such as shafting, couplings, bearings, clutches, pulleys, sheaves, belt tighteners, speed transformers, agitators, gears and sprockets. The featured products of the company are the Cleveland type oil-film bearings, Smith type friction clutches, steel arm automatic belt tighteners, forged cast spur gears, industrial type spur gear speed transformers and flexible couplings.

Root Spring Scraper Company, Kalamazoo, Mich., is making life guards for the sixteen cars being built by J. G. Brill, Philadelphia, Pa., for the Honolulu Rapid Transit Company.

New Advertising Literature

Electric Controller & Manufacturing Company, Cleveland, Ohio, has just published two bulletins, 1037-C and 1042-F. Bulletin 1037-C describes type B limit stops for use with alternating and direct current motors. Bulletin 1042-F describes automatic compensators for 100 to 550-volt a.c. squirrel cage and synchronous motors.

Irving Iron Works Company, Long Island City, N. Y., is issuing a descriptive folder of its subway flooring grills which are applicable to street car steps, etc.

Ohio Brass Company, Mansfield, Ohio, has issued a novel folder directing attention to the co-operation of its engineers in the recent catenary installation on the Chicago, South Shore and South Bend Railroad. The text matter is a reprint of an article "High Current Capacity with Exceptional Flexibility Feature of Catenary" by L. W. Birch, line material engineer of the company, which appeared in the ELECTRIC RAILWAY JOURNAL for Nov. 27, 1926.

Lebanon Steel Foundry, Lebanon, Pa., is mailing out a descriptive folder covering its steel castings for electric furnaces.

Crouse-Hinds Company, Syracuse, N. Y., is issuing bulletins Nos. 220, 2097 and 221 setting forth electric flashing beacons, groundulets and its type B automatic variable timing switches and control cabinets, respectively. Bulletin No. 220 has some interesting diagrammatic sketches illustrating the use of electric flashing beacons as a protection for safety zone platforms in street railway work.

D. B. Flower, manufacturer of electric railway accessories, Philadelphia, Pa., has just issued two booklets describing the application of the Flower new type brush-holder. The design and performance of this new device are adequately presented by pithy text matter and illustrations.

J. G. Brill Company, Philadelphia, Pa., has a new bulletin in the mails describing its 76-E truck with outside hung motors. The bulletin also contains information on such accessories as solid forged side frames, transoms, side bearings, bolster guides, graduated spring systems, etc.

Metal, Coal and Material Prices

Metals—New York	Feb. 23, 1927
Copper, electrolytic, cents per lb.	12.746
Copper wire, cents per lb.	15.00
Lead, cents per lb.	7.40
Zinc, cents per lb.	7.16
Tin, Straits, cents per lb.	69.875
Bituminous coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.625
Somerset mine run, Boston, net tons	2.00
Pittsburgh mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	2.175
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N.Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.80
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.69

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, March 5, 1927 *Number* 10

Prejudice Must Necessarily Recede Before Analysis

MUCH has been written in the last five years about the place of the bus in the field of transportation, but few men have been more specific about their ideas than was R. N. Graham, manager of railways of the Pennsylvania-Ohio Electric Company, in his paper before the Metropolitan Section of the Society of Automotive Engineers. The experience of Mr. Graham's company has extended to the fields of both urban and interurban service. He has viewed the bus with a sympathetic eye, but he has not allowed himself to become enamored of that vehicle to the extent that his admiration of it has been allowed to warp his judgment. To him there is very little that is tangible in the so-called rubber urge. This is not a theory with him. He has studied the matter at close range. Any choice between the two vehicles on the part of the passenger is simply one of greater convenience. His reflection about the rubber urge is worth pondering, namely, that inferences have been hastily drawn ascribing to this intangible element an influence which it never really wielded. Mind you, this is not derogatory of the bus! Neither was he derogatory of the bus when he said substantially that single-deck buses cannot be operated at a profit even under the most favorable conditions of traffic at the average city rate of fare for a distance greater than 3 miles.

No statement that Mr. Graham made shows better the impartiality with which the matter has been considered than the one to the effect that his company did not intend to operate a street car where a bus could be used more effectively; nor did it intend to operate a bus where the use of a street car produces a more satisfactory result in the service to the public and in financial results to his company. That certainly is specific. It is playing no favorites. The problem is an economic one, and Mr. Graham intends to keep it one so far as his ability goes to interpret events in terms of the best interests of his own company and the greatest convenience of his patrons.

So much was said by him that is significant that in writing about the matter the tendency of the reviewer becomes almost irresistible to repeat the axioms with which Mr. Graham's paper is replete. That, of course, would defeat the ends sought by comment such as this. To everybody everywhere interested in this matter the statement made by the author is significant that there is hardly a city in the United States of 150,000 population that could not well support a supplementary bus service at a 25-cent fare and that the demand for vehicles for this service would furnish a more stable market to the bus manufacturing companies than the attempt to force into mass transportation at standard rates of fare vehicles wholly impracticable to operate from a standpoint of profit.

As for electric railway men, what could be more significant to them than that the company at Youngstown is now operating nearly as many buses as street cars and as a result the railway situation has been improved and bus operation made self-sustaining! Was ever stronger vindication offered of the policy of coordination and not of substitution? In that they were very specific Mr. Graham's remarks should tend to preserve a sense of proportion as regards the places of the two vehicles. His statements about the street car and the bus were not iconoclastic of either of these vehicles. The answer to the question of the use of these vehicles is to be found more in analysis and less in prejudice. The farther the first of these practices is carried the more will the other be compelled to recede.

Where Angels Fear to Tread

UNFORTUNATELY, in most large cities, the individual is not permitted to select his transportation service to fit his particular desires and pocketbook. Transportation companies have been forced to develop within narrow limits as to character of service and price. They have not been permitted to provide a different grade of service for the man who is willing to pay more for additional comfort and luxury.

This is not directly attributable to any deficiency on the part of transportation companies. The responsibility lies primarily on the shoulders of those who have exercised regulatory authority over them. And because low-priced transportation service has proved an effective issue on which to ride into office, politicians have too often forced a low-priced, low-grade service (in terms of comfort) whether or not we were willing to pay for more.

The only other choice in local transportation is the private automobile or the taxicab, but the cost for such individual service jumps to five or ten times that of the common carrier. Although the bus afforded an excellent new agency with which to build a new character of service at an entirely different level of rates, and was unrestricted by precedents, its proponents have not always risen to their opportunity. Most of those interested in the development of buses are busy making them into street cars on rubber tires at street car rates, so that the man who is willing to pay more for greater comfort in his daily transportation still has little choice outside the taxicab or private vehicle.

As Mr. Graham has indicated full advantage has not been taken of the opportunity to develop a distinct character of common-carrier service at a level of rates ample to permit a substantially higher grade of transportation service to be rendered. Already in New York, where the scramble for bus franchises pitted a large number of eager bidders against each other, the 5-cent piece has been permitted to become in the popular mind the unit for measuring bus fares. Despite the fact that this bit of political bait which has sufficed to distract the attention of the long-suffering riding public over many years has so starved the existing transportation companies as to make their so-called valuable perpetual franchises mere obligations to render service at a loss, there are apparently many bus optimists who are anxious to rush into an obligation to run buses at street car rates on the bland assumption that a franchise to conduct a service at a loss is worth a lot of money. Of course, there can be no particular quarrel with those who are willing to put up their money under such conditions, but in the fact that these promoters are dragging the bus down to the level of the sadly starved New York street car they are establishing precedents for the bus that will be difficult to overcome in the future.

Marking the Price on the Package Does Not Guarantee Its Worth

CRITICISM of the present popular practice of issuing no-par-value stock is one of a number of interesting points emphasized by Prof. William Z. Ripley in his recent writings on various phases of corporate financing. Like most generalizations, his comment fails to fit in many instances. So far as electric railways are concerned, his criticism seems to have little application, and the arguments in favor of no-par-value stock appear to be at least as strong as those against it.

Briefly stated, Professor Ripley's objection is that the issue of stock without par value makes it difficult to determine how much money actually has been invested in the property and hence to some extent shrouds in obscurity the financial status of the company. In the case of a utility under the jurisdiction of a regulatory commission, there are two groups which have a legitimate interest in its financial affairs—its security holders and its customers. It is difficult to see how either group would benefit greatly by the establishment of a par value for every share of stock.

No fixed relation exists between the actual value and the par value of any stock. The actual value is determined by the equity behind the stock and by its potential earning power. Frequently, earnings are plowed back into the property, thereby increasing the value of the stock far above what it was originally. Many electric railways at times when it was deemed inexpedient to issue securities have financed improvements out of earnings. To those not in a position to know all the details of the company's affairs, the establishment of a definite par value for its stock may easily be more misleading than informative. Records are always available, however, to show the capital expenditures that go into a property. In these records lies the stockholders' best protection.

The customer's interest in the financial affairs of a utility concerns only their effect upon rates. At present, rate determination depends almost universally upon a valuation which is entirely independent of the face value of outstanding securities. A reasonable return is allowed on the so-called "actual value" of the property. Par, therefore, means nothing to the customer. His interest is protected by a regulatory commission. Under these circumstances the value of the stock may well be left for determination to the law of supply and demand.

South Shore Line a Trail Blazer

IN ITS revolutionary step of placing in service all-steel, six-truck, parlor-observation and dining cars, the Chicago, South Shore & South Bend Railroad has delivered a smashing blow to competition as well as to a case-hardened precedent of the industry—the practice of false economy.

In the latter case, such service aligns the South Shore with those trail blazers in the field who long have realized that men and fashions change, that today comforts are not considered luxuries as they were ten years ago. To prove this assertion, one has only to walk through any of the steam railroad express trains. Gone are the lunch boxes and crowded day coaches. From every walk of life can be counted those who are availing themselves of the creature comforts afforded by de luxe service. With the economic upheaval incident to the World War has come a demand for a better class of traveling facilities. What was good enough for father is not good enough for son. The people are willing to pay for better service, and if the electric railways will not supply it, then they will seek that form of travel commensurate with a new social status.

While not all public utilities can afford the refinements of the South Shore, they can, nevertheless, follow its example in proportion to their means. Clean cars, paint, courteous service, a few little appeals to the new tastes of passengers, and informative publicity will, in proportion, place the little fellows of the industry in the front rank of trail blazers.

Progress today is a huge juggernaut that pursues us relentlessly. If we hold to the old fanatical precedent, then sooner or later, like the Indian ascetic, we will be mashed flat. Such adherence to hidebound precedent is a beautiful gesture with a meaningless purpose. It is creating a lot of industrial morons.

Temper Your Tools Before You Cut

SINCE public relations, as the name implies, covers all phases of a company's dealings with its public, no possible element of contact should be slighted. Least of all should those in charge of a railway's destinies discount the important rôle which the platform men may play in stimulating that somewhat intangible, but none the less essential, asset of good will.

Should a surgeon exercise the greatest diligence in preparing his instruments for use in an operation, sterilizing them with minute attention, and then fail to give equal attention to the hands which will guide those instruments, he would fall far short of his duty. And the conductors and motormen are the very hands of the railway. It is they who come daily in personal contact with the passengers. The public relations department may talk till it is literally blue in the face; it can publish house organs and lay out advertising campaigns which will indicate beyond peradventure that the company's first and primary consideration is the welfare of its passengers. But the yardstick by which Mr. Average Man measures the railway and its service is simply the attitude of the rank and file employees toward him. This is of course assuming that the company is playing fairly with its patrons and is endeavoring to give frequent and comfortable service.

Complaints of discourtesy, of personal shortcomings of individual employees, are most difficult of all to handle satisfactorily. With a complaint of inadequate service in a certain section of a community it is possible to determine specifically whether the requested improvements are feasible. Service complaints may be reduced to more or less simple considerations of profit and loss. But not so with the personal factor. It is difficult to obtain fair and incontrovertible proof of an employee's culpability. The unsubstantiated word of the complaining passenger cannot always be accepted. Possibly the patron deliberately set out to stir the animus of the employee and is endeavoring to wreak his vengeance upon the individual for real or fancied grievances against the company.

But it may safely be asserted that where the total of personnel complaints on a given property is exceptionally high there is some fire to justify all of the smoke. The direct dealings of an established public relations department with the public are essential and worthy of careful attention. But the best way of reaching the passengers is not through the newspaper columns or over the radio. It is simply through the smile on the face of Conductor Brown or Motorman Jones. There is no use in theorizing with the men. Show them specific instances in which they can establish themselves in the eyes of their passengers as transportation salesmen. They are not blind to the importance of their own jobs, but they need thorough enlightenment on the important subject of public relations. They must be shown the how and the wherefore of adopting merchandising principles in the collection of fares and the operation of street cars. Let the individual once feel his personal responsibility for the success of the public relations campaign that his company is making and half the battle is won.

New Money for a Regulated Utility Is in Competition with Industry

DISTINGUISHED from a manufacturing establishment, the utility is supposedly non-competitive. This condition is only partly true, but because of it the utility is hedged in with many laws and regulations intended to limit its earnings and to control its financing. This control is either by public service commissions which establish the status of utilities from time to time as operating or economic conditions dictate, or by service-at-cost franchise in which the rates and the rate bases is determined once for all in advance.

Frequently it is overlooked that two streams of money must be continually flowing into a utility property serving a growing community. One stream, in the form of revenues derived from the sale of service, must pay all of the operating costs, the maintenance of the physical equipment, interest on borrowed capital and a profit to the owners. The second stream is the new capital that is necessary to keep the property abreast of the times, to build extensions and make possible service to new customers. The utility, therefore, must for this reason frequently go into the open market to borrow money. To be successful it must pay the market price and must meet the market conditions of the moment. If not free to do so new money will be diverted to other channels and the company cannot properly grow to serve its public.

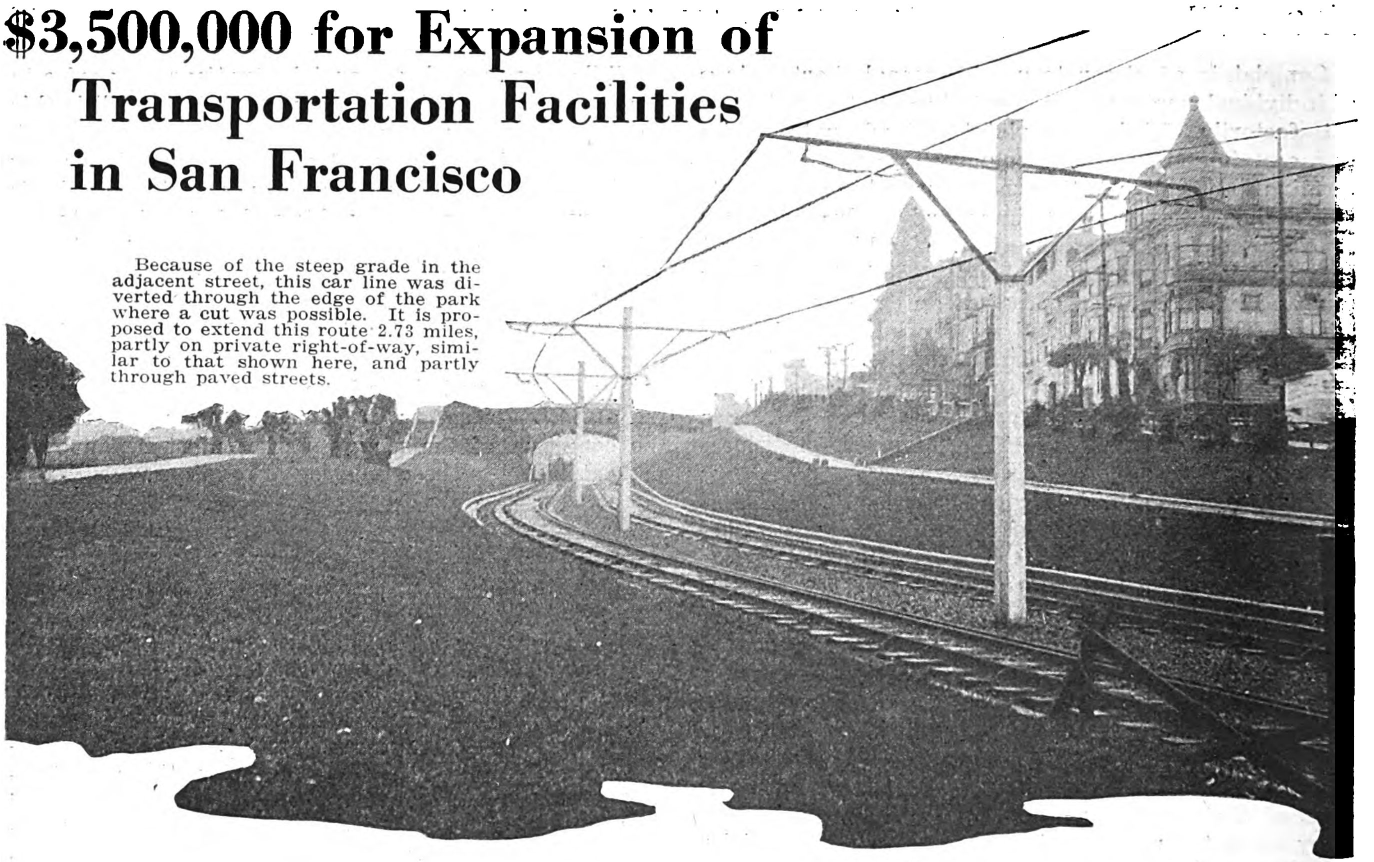
While many complex financial situations may arise in the operation of utilities, at the base of them all is this situation that the utility, no matter how it is regulated, is in competition with all industry in the search for new funds. It is one thing for a regulatory body to limit earnings on money already obtained, but it is quite another to hold them so low that investors cannot be induced to supply the capital necessary for expansion. A commission may control the fare charged and the rate of net earnings that may be allowed. It cannot, however, force the investor to put his money in an enterprise where there is little hope of profit and no guarantee of ultimate safety of principal. For this reason, the condition of the money market must be an ever-present factor in the regulation of earnings.

Twin Cities Confident of the Results of Co-ordination

NOT the least important of the statements contained in the annual report of the Twin City Rapid Transit Company is the expression of confidence on the part of the management that the services of the company can be successfully co-ordinated. This is particularly significant because co-ordination there contemplates the welding together of electric railway, bus and taxicab services on a scale of no mean proportions in its contemplation of the use of the bus and the taxi. The net earnings of the buses for the year 1926 were small, but the explanation given is that complete control of the bus lines was not acquired until the early part of 1926. Time is the element needed to consolidate operations on an efficient basis. With the start well made on that program, the management is satisfied that the bus properties will earn a much larger return during 1927. As for the acquisition of the taxicabs, their ownership has been a matter of only a few weeks duration. About them, too, the management is optimistic. It feels that the unification of the competitive cab companies will materially improve public transportation by reducing congestion. Certainly that end would not be achieved under competition.

These things are in the future. As for the past, the company closed 1926 with a net income of $1,436,805 transferred to profit and loss compared with $1,037,427 for the previous year. In addition to the dividends on the preferred stock it paid four quarterly dividends of 1¼ per cent on the common stock, or 1 per cent more than was paid during 1925. Gross revenue was up about $1,500,000 and the recession in passengers carried was inconsequential compared with the grand total carried the year before. Some kinks still remain to be ironed out under the settlement plan which governs the terms under which the company is now operating in St. Paul and Minneapolis, but the progress made indicates that the cities and the company face a future auspicious for both of them. This statement is perhaps subject to the reservation that nothing comes of the so-called Brooks-Coleman legislation, now pending in Minnesota. The case against that legislation is very strong. Repeal of the state regulatory act, contemplated by this measure, would, to say the least, destroy much of the effect of the recent harmonious moves in the Twin Cities. That is not a prospect which the people of these cities can contemplate with equanimity.

$3,500,000 for Expansion of Transportation Facilities in San Francisco



Because of the steep grade in the adjacent street, this car line was diverted through the edge of the park where a cut was possible. It is proposed to extend this route 2.73 miles, partly on private right-of-way, similar to that shown here, and partly through paved streets.

By M. M. O'Shaughnessy
City Engineer San Francisco, Cal.

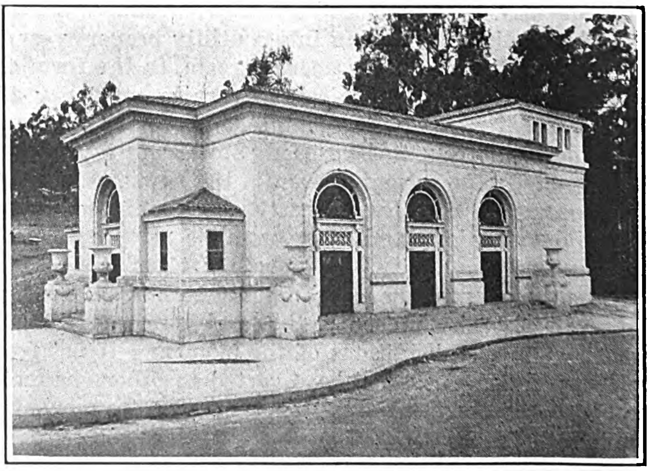
Municipal Railway Will Open New Ocean View Line This Summer—Track Extensions Totaling 11.6 Route-Miles Are Planned—47 Additional Cars and 26 Buses Will Be Bought

RECENT improvements made by the Municipal Railway of San Francisco and new projects planned for the near future involve extensive changes in the local transportation system of that city and surrounding territory. A new car line to serve the Ocean View district will be opened this summer. The Duboce tunnel, an undertaking similar to the famous Twin Peaks tunnel, will be completed in the latter part of this year or early in 1928. A four-track addition is being made to the Mariposa Street carhouse. New shops and garage facilities are planned. Track extensions of considerable length are contemplated and much additional rolling stock will be bought. These improvements are to be financed by a bond issue of $3,500,000.

At present the railway operates 188 double-truck and 21 single-truck passenger cars on about 70 miles of track. It is planned to add 47 double-truck cars. The majority of the present cars are of the California type, 47 ft. 1 in. long and 9 ft. 2 in. wide with seating capacity for 54 passengers. The average weight is 50,000 lb. They are of semi-steel construction and on account of the severe grades are equipped with four 60-hp. or 65-hp. motors per car. In the near future 26 new buses will be added to the thirteen now in operation. Thus the next year will see a substantial expansion in the transportation system which originated fourteen years ago through the taking over of the Geary Street cable line from the Park & Ocean Railway, whose franchise had expired.

At that time the cable construction was torn up and the old road was converted into an electric line, with extensions reaching west to the ocean and east to the ferries. The first section of this line was placed in service in December, 1912, and in June, 1913, the balance of the Geary Street line was placed in commission with 15.08 miles of single track, together with 1.10 miles of sidings and turnouts.

To handle the traffic to the Panama-Pacific International Exposition, held in 1915, a bond issue of $3,500,000 was voted in 1913. The line of the Presidio & Ferries Railroad, whose franchise had expired, was acquired in December of that year, and in less than twelve

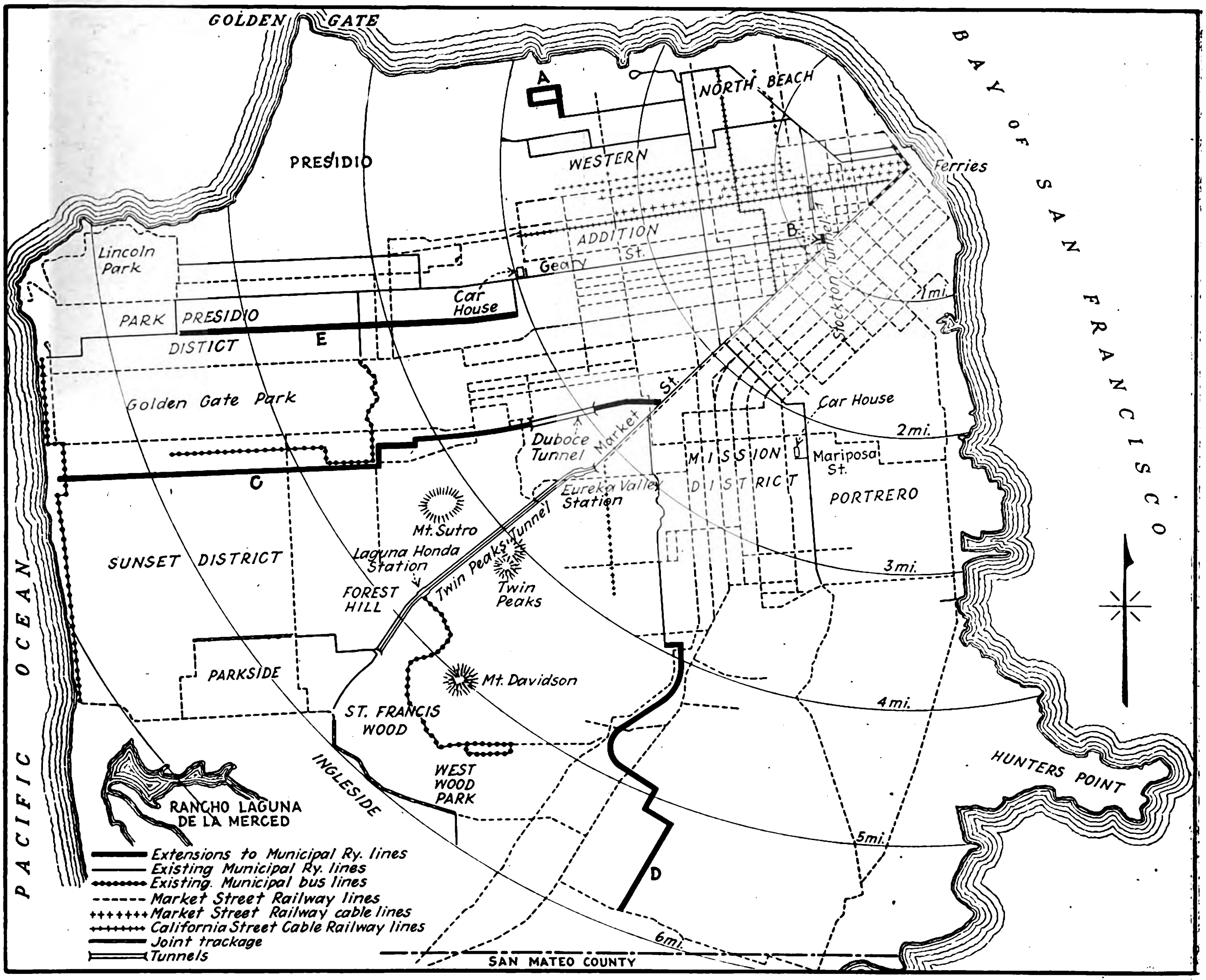


Type of Station Used at Intermediate Points of Tunnel. Elevators Lower the Passengers to the Train Level months from the time of voting the bond issue new lines, constructed from these funds, were placed in commission.

In general, the policy of planning new lines has been to supplement the privately owned system of the Market Street Railway by building only where the new routes would serve territory not otherwise taken care of. Only such competitive lines have been built as were considered necessary to make the municipal system an operating entity. Thought has been given to the trackage necessary for a unified system, combining both privately owned and municipally owned lines. This is the ultimate end in view as it is believed that only through the unification of transportation facilities can maximum service be secured.

San Francisco is a city of hills and these have had a marked influence on the layout of the street car lines. The cable railway was first developed here and to this day a considerable number of routes must be operated by cable in order to negotiate the grades. These lines are slow and inflexible as to routing. It is impossible to replace them by trolley lines without making detours or resorting to expensive private rights-of-way, neither of which will give direct service as do the cable lines.

To provide access to some of the desirable residential property lying on the remote side of the hills from the main business district it has been necessary to drive two tunnels through intervening ridges and the construction of a third is now in progress. The shortest of these is the Stockton Street tunnel, approximately 900 ft. long, which leads from the main business section to the North Beach district. This was completed and used in connection with the 1915 exposition. In 1918 the Twin Peaks tunnel was opened. This is exclusively rapid transit, 12,000 ft. long, 25 ft. wide and 18 ft. high, providing a high-class residential territory with transportation many minutes faster than it had previously.

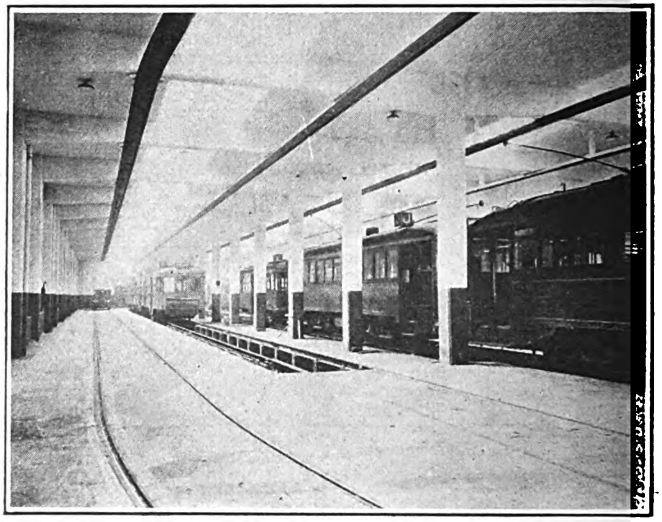

GOLDEN GATE
BAY OF SAN FRANCISCO
PRESIDIO
A
NORTH BEACH
WESTERN ADDITION
Ferries
B
Geary St.
Stockton Tunnel
1mi.
Lincoln Park
Car House
PARK PRESIDIO DISTICT
E
Golden Gate Park
Duboce Tunnel
Market St.
Car House
2mi.
C
Eureka Valley Station
MISSION DISTRICT
Mariposa St.
PORTRERO
Mt. Sutro
Laguna Honda Station
Twin Peaks Tunnel
Twin Peaks
SUNSET DISTRICT
FOREST HILL
3mi.
PACIFIC OCEAN
PARKSIDE
Mt. Davidson
4mi.
ST. FRANCIS WOOD
HUNTERS POINT
INGLESIDE
WEST WOOD PARK
RANCHO LAGUNA DE LA MERCED
5mi.
D
6mi.
SAN MATEO COUNTY
Extensions to Municipal Ry. lines
Existing Municipal Ry. lines
Existing Municipal bus lines
Market Street Railway lines
Market Street Railway cable lines
California Street Cable Railway lines
Joint trackage
Tunnels

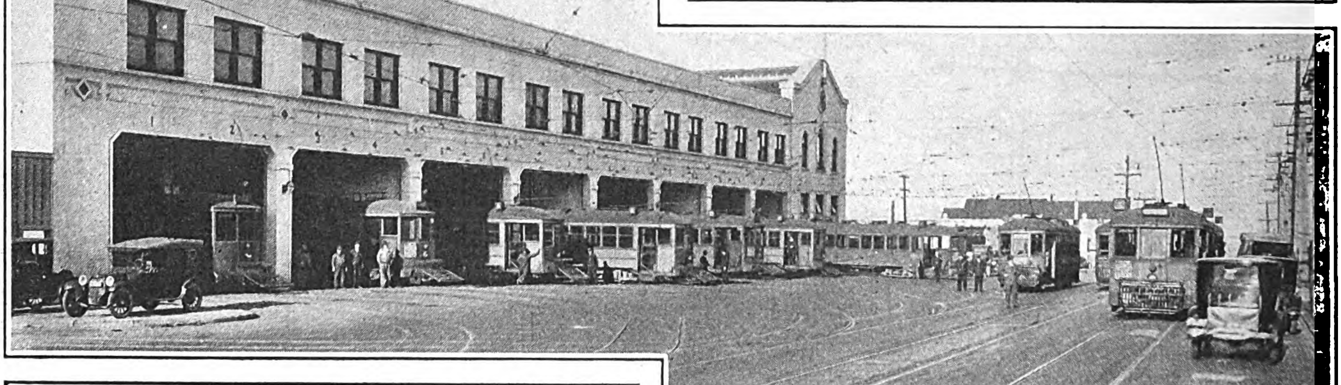
Track Extensions Totaling 11.6 Miles of Route Will Substantially Augment Transportation Facilities in San Francisco. (A) Marina Track Extension, (B) Downtown Loop Connection, (C) Duboce-Sunset Extension, (D) Excelsior District Extension, (E) Balboa Street Extension

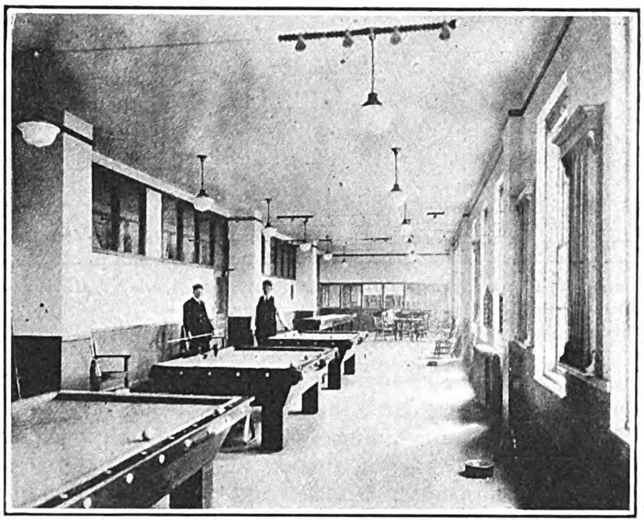
The Duboce tunnel, now being built, has the same cross-section as the Twin Peaks tunnel. Through it a new line to the Sunset District will be operated. This tunnel has a length of 4,200 ft. and will be placed in commission late in 1927 or early in 1928. All of these tunnel projects have been paid for by assessments levied on the property directly benefited.

Grading for the extension of the railway into the Ocean View district, running from St. Francis Circle through the Merced Rancho lands, was completed about a year ago. It was necessary to make two large earthfills across gulches which, on account of the dryness of the season, were expected to settle. This made it inadvisable to lay track at once. Experience during the past wet season showed the wisdom of this delay. Trolley poles, wires and feeder cables have already been erected and contracts recently were awarded for the track laying. This will be completed during the coming summer.

Several track extension projects are planned for the near future. The area once occupied by the Panama-Pacific exposition has been subdivided, streets have been paved, sewers built and 200 houses are now being constructed. The whole district is being settled very rapidly, but is without adequate transportation, although the Municipal Railway is adjacent to it on two sides. It is proposed to construct 0.69 mile of new route to serve this area. By the construction of 1.9 miles of new track a downtown loop can be built to relieve congestion at the ferries and provide an emergency route in case of a blockade on Market Street. Completion of the Duboce tunnel already referred to will necessitate the construction of 4.54 miles of new double track from Market Street to the beach. At present a large territory known as the Excelsior district is without any transportation. It is proposed to extend the Church Street line via private right-of-way and existing streets to a point near Geneva Avenue, a total distance of 2.73 miles. Between Fulton and Geary Streets is an area approximately 2,640 ft. wide without transportation facilities. The growth of this district during the past few years has been phenomenal. Proper handling of the traffic necessitates the construction of 2.79 miles of double track on Balboa Street, roughly bisecting the unserved area. In all, these projects total 10.94 route-miles and would cost $1,395,000 for track construction. A summary of the mileage and cost is given in an accompanying table. Their locations in relation to the transportation system as a whole are shown on a map on another page. Other short additions bring the total of proposed new routes to approximately 11.6 miles.







Carhouse Facilities of the Municipal Railway of San Francisco

At top—New inspection and storage tracks recently constructed on the upper level of the Mariposa Street carhouse.

Center View—Carhouses of the Municipal Railway of San Francisco are designed to permit entrance at different levels from two streets. This shows the front entrance of the Geary Street carhouse.

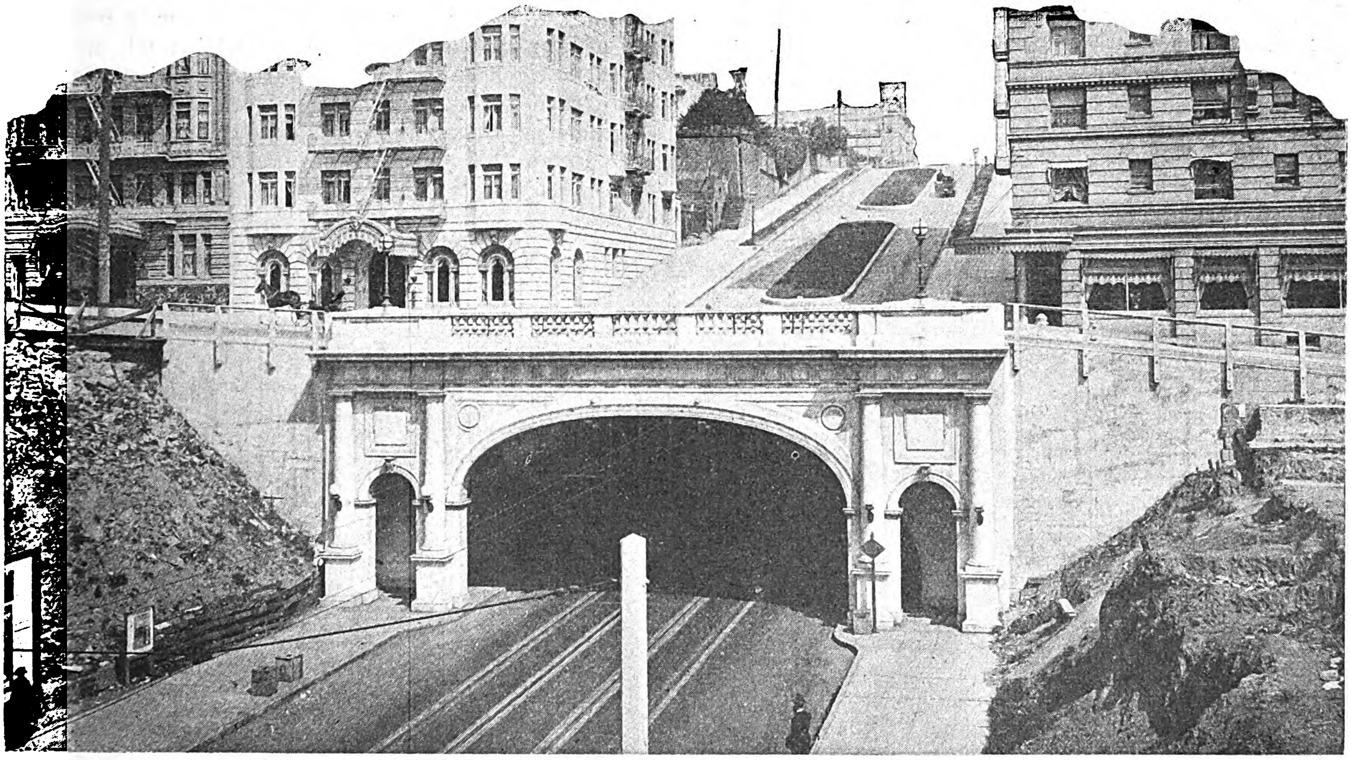
At left—Recent improvements at the Mariposa Street carhouse include a recreation room for employees.

Proposed extensions of bus operations involve five new routes and 7.67 route-miles. Details concerning the bus operation of the Municipal Railway will be given in an article to appear in a future issue of ELECTRIC RAILWAY JOURNAL.

At present two steel and concrete carhouses are in use in different sections of the city. The sites were selected with a view to double-decking, cars going into the lower level from one street and onto the upper level

SUMMARY OF RAILWAY PROJECTS

		Route-Miles	Cost of Track
A	Marina tract	0.69	$60,000
B	Downtown loop	0.19	70,000
C	Duboce-Sunset	4.54	567,000
D	Excelsior district	2.73	343,000
E	Balboa Street	2.79	355,000
	Total	10.94	$1,395,000



Entrance to Stockton Street Tunnel. The Duboce Tunnel, Which It Is Hoped to Complete by the End of the Present Year, Is Similar in Purpose Although Considerably Longer

from another street at a higher elevation. The Geary Street carhouse will accommodate 120 cars and that at 17th and Mariposa Streets 140 cars. During the past year a second story was added to the carhouse at the latter location. This does not cover the entire area of the lower story, but provides four extra storage tracks with inspection pits, giving an added capacity of 32 cars. Offices for the assistant superintendent, dispatcher, inspectors and cashier, as well as a waiting room, recreation room and reading room, have been provided.

Provisions were made in the original Geary Street carhouse for a small repair shop to take care of the 43 cars then owned. The Municipal Railway now has 213 cars, thirteen buses and other equipment which must be maintained. No addition has been made to the original shop space and it has now become impossible to keep up with the work to be done. An appropriation of $250,000 is desired for the construction of a modern car maintenance and repair plant.

Subway Building Filmed

CONSTRUCTION work on the Eighth Avenue subway system in New York City is shown in motion picture film recently released by E. I. du Pont de Nemours & Company of Wilmington, Del. This film, which is entitled "Building New York's Newest Subway," is printed on safety stock, is one reel in length and requires fifteen minutes for showing.

The film is a veritable trip along the line of activities, as it shows not only scenes underground where great ledges of rock are being blasted away in the tunnels but also work in the open trenches and cuts. How windows are safeguarded from vibration caused by blasting, how monuments are propped up and how telephone and electric cables are kept in operation are pictured in the reel, as are the great tools used in the work, such as telphers, caterpillar shovels, powerful trucks and steam hoists. Scenes showing how explosives are used and stored on the job are interesting features. Other views show partially finished sections where the steel framework is in place.

This film may be obtained upon application to the publicity bureau of E. I. du Pont de Nemours & Company of Wilmington, Del.

Vienna Slowly Recuperating

Statistics of Traffic During Last 21 Years Show Many Fluctuations and Recent Large Increase in Passengers—Flat Fare Now Used

LOCAL transit conditions in Vienna during the past 21 years are treated in an interesting review in a recent issue of *Verkehrstechnik* by Dr. A. Winter of the Vienna Municipal Railway System. The period covers nine years prior to the outbreak of the war, five war years and seven post-war years. The means of communication in Vienna are an extended surface railway system, an elevated and subway rapid transit system and buses. All of these are now owned and operated by the city.

With a population of 1,800,000, Vienna has today about as many inhabitants as it had in 1905. The steady growth of population in pre-war years reached a maximum of 2,200,000 at about the beginning of the war at the end of 1914. During the war the figure fluctuated, but by its close a heavy decline had set in. Since 1920 the city has recuperated slowly in population. Fully dependable statistical investigations carried on for many years past disclose the notable fact that within recent years the total number of rides on public vehicles has been constantly growing. In spite of the greatly decreased number of inhabitants, the average number of daily rides on trolleys and rapid transit systems is today about the same as it would have been had the old ratio been maintained and the city grown steadily at the rate of pre-war years.

Various factors are responsible for this rather paradoxical development. The chief reason is the gradual shifting of the center of population away from the business center, so that people have longer distances to cover to get to and from their work.

Up to 1916 Vienna used the zone fare system with three graded fares. In that year, owing to the rapid increase in the number of maximum fares, as compared with the two lower rates, the lowest fare was dropped. This left only two rates, and in 1921 one unit fare was adopted for all rides.

The average distance traveled per passenger per ride grew gradually but constantly from slightly over 4 km. (2½ miles) in 1908 to 5.6 km. (3½ miles) in 1926. Like most metropolitan cities, Vienna has shown during the last twenty years a decided "city formation"; that is to say, the center of the population is moving more and more away from the inner part of the city, which is the business district.

During the war years a very large increase in business was done by the surface lines, the peak being reached in 1918. The reasons were the enormous devaluation of money, the greatly increased number of male and female workers in war industries and the large number of business people and soldiers called to Vienna, as the war center of Austria. During the following year, 1918 to 1919, a decline set in, more violent than the previous rise, caused by restrictions of operation due to scarcity of coal and cars, and the general poverty of the people. During 1920 and 1921 a distinct improvement in traffic was again recorded. This was again followed by the deflation panic of 1922, when the lowest point was reached. Money became next to valueless, causing the cost of living, expressed in this money, to soar to unheard of values. Families depending upon a fixed income, like annuities, had great financial difficulties, but wages and salaries were raised as the value of the currency declined. During this period the trolley system carried practically all of the traffic, as bus lines and entire sections of the rapid transit system had to suspend operation.

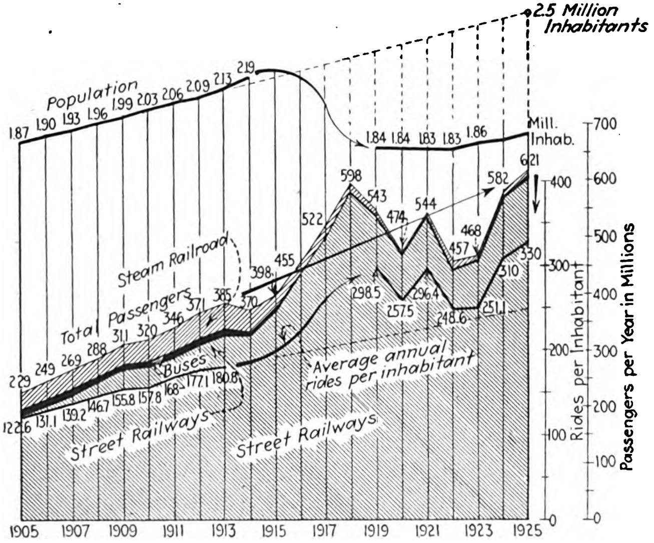


Chart Showing Data of Vienna Local Transit

Conditions began to improve at the end of 1922, showing immediately a rise in traffic again. Another factor in favor of increased trolley riding was the exceedingly acute scarcity of living quarters. Building had practically stopped since 1915, and while it was previously customary for the workman to move nearer to his new place of employment when he changed his job, he had to stay now where he lived, regardless of how far he had to travel to his new place of work. A large army of workmen is thus being transported daily by the trolleys between their homes and their factories. More than 80,000 persons are at present seeking more convenient living quarters. An extensive building program, covering the erection of 25,000 houses for some 100,000 people, is now in progress. The houses are being built in blocks, scattered over the entire area of Vienna.

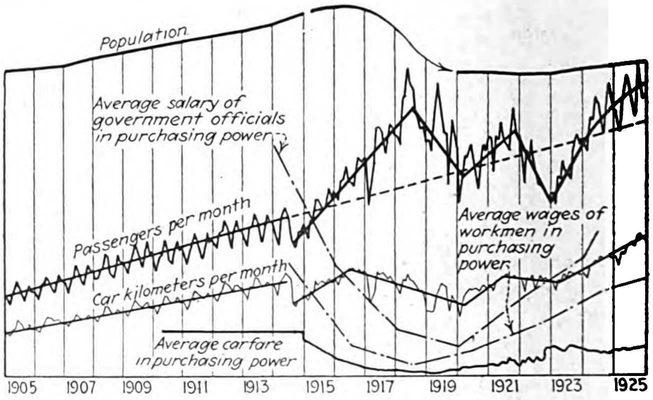


Chart Showing Purchasing Power of Wages and Other Data Affecting Riding in Vienna

Another and very important impetus to more frequent riding on public conveyances was given by the electrification of the Stadtbahn (elevated and subway line) in 1925, with the same ticket valid on all rail lines, both trolley and rapid transit. With the greater speed and comfort on the new electric trains the passenger traffic on the Stadtbahn more than doubled. At present 270,000 passengers are carried daily. During morning rush hours (if this expression can be used for Viennese traffic), between 7 and 8 a.m., an average of 22,000 passengers are transported.

On pleasant Sundays and holidays in the summer as many as 60,000 persons have been carried during a four-hour afternoon period. A noticeable addition to the number of public carriers is contributed by motor buses, which operate radially from the center of the city to the outer trolley lines.

A final impetus to travel which should be included is no doubt the very low unit fare, which is only 80 per cent of the pre-war average fare. This percentage corresponds to two-thirds of the purchasing power of the fare in 1914. For this reason a further increase in passenger traffic may be expected.

Indiana Utilities Important Revenue Producers

SEVENTEEN per cent of the taxes collected in Indiana are paid by public utility companies, Fred A. Sims, formerly chairman of the Indiana tax board, recently told classes in public utilities and public utility law at the School of Commerce at Indiana University. He said that the importance of these properties as revenue producers might be illustrated by the fact that in 1924 they represented 12.88 per cent, while in 1926 they represented more than 17 per cent of the total value of property for taxation in the state.

One of the fare zone limit signs along the route. This view shows the type of concrete highway over which the coaches run and the character of much of the territory.

Interurban Service Offers Broad Field for the Bus

By R. N. Graham

Manager of Railways Pennsylvania-Ohio Electric Company

Electric Railways Have Never Covered the Field that Exists for Transportation Outside the Cities, and Today Buses Are Able to Handle a Great Share of This Business—Operating Refinements Overlooked in Bus Design Should Be Given Attention

IN THE field of suburban and interurban service there is a tremendously great future for the motor bus. Here we are no longer limited by a flat fare. Every ride is a zone ride. The territory where interurban street railways were never built is vastly greater than the unfilled field in city operation. Since the ratio of initial investment to the number of passengers carried is so much less in the case of the bus than the street car, it is possible to operate bus lines where under no conditions was it possible to operate any form of transportation requiring a fixed investment in way structures.

Thus the communities without adequate public transportation connection with other communities which are either natural markets, sources of supplies or in which there are other community interests are rapidly being connected with motor bus lines.

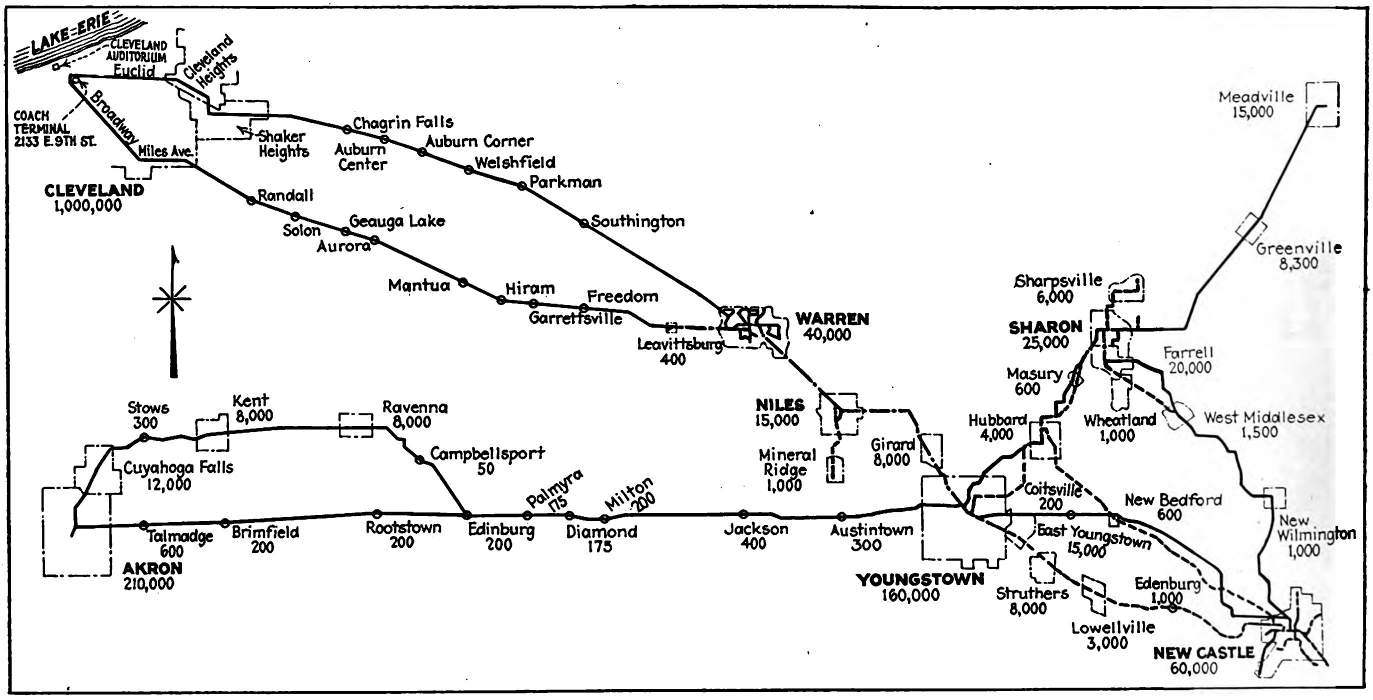
Where interurban railways have already been built the bus can be used by such properties in an intensive development of their territory such as was never possible without the bus. On our own property prior to 1922 we operated approximately 60 route-miles of interurban and suburban railway. We are now operating nearly 400 route-miles of coaches. The comparison of our present interurban operation with coaches and street cars is as shown in the accompanying table.

The number of coaches and street cars shown in this table is the number required for regular runs. We own 29 modern interurban cars and 43 interurban coaches. Parallel to our interurban lines the coach service is a high-class express service operated at a higher rate than the electric cars, which carry heavy industrial loads that could not easily be handled by the smaller capacity coaches. The connections of Youngstown with Cleveland, with Akron and with Meadville are natural transportation routes which it would not have been possible to establish by building interurban railways in recent years. It is thus apparent that the use of the motor bus has enabled us to give not only a more comprehensive service to points where our rail lines already operated, but has enabled us considerably to extend our service to the public.

On our main interurban coach lines we maintain complete and adequate terminal facilities in the larger cities. In cities such as Cleveland, Youngstown and Akron to maintain a modern waiting room in the heart of the city represents a great expense, but we feel that we cannot offer our fa-

THIS is the second article based on an address before the Metropolitan Section, Society of Automotive Engineers, by Mr. Graham in New York on Feb. 17. The first article, which covered the place of the motor bus in urban transportation, was published in last week's issue of ELECTRIC RAILWAY JOURNAL. Mr. Graham has taken up the field for interurban bus operation and also points out to manufacturers some of the features of bus design which cause difficulty in operation.

cilities to the public as a real service without extending all necessary conveniences to it in its use of our service. In all the towns through which we go we also maintain depot arrangements. Our routes are marked with zone markers, and stations, both in the great cities and small towns, are equipped with electric signs. On our line from Youngstown to Cleveland we maintain garages in Youngstown, Warren and Cleveland, with relief coaches for use that the service may be certain. On our line between Youngstown and Akron we maintain garages at Youngstown, Edenburg and Akron for the same purpose. We have never annulled a trip on account of ice, snow, fog or road conditions. We have operated this interurban service during wintry months when the operating expenses were more than twice the revenue obtained, feeling that when we have finally established the fact in the minds of the people that coach transportation is perfectly dependable they will feel as safe in undertaking a trip in zero weather as in balmy midsummer.


LAKE ERIE
CLEVELAND AUDITORIUM
Euclid
Cleveland Heights
COACH TERMINAL 2133 E.9TH ST.
Broadway
Miles Ave.
Shaker Heights
Chagrin Falls
Auburn Center
Auburn Corner
Welshfield
Parkman
CLEVELAND 1,000,000
Randall
Solon
Geauga Lake
Aurora
Southington
Mantua
Hiram
Freedom
Garrettsville
Leavittsburg 400
WARREN 40,000
Meadville 15,000
Greenville 8,300
Sharpsville 6,000
SHARON 25,000
Farrell 20,000
Masury 600
NILES 15,000
Mineral Ridge 1,000
Girard 8,000
Hubbard 4,000
Wheatland 1,000
West Middlesex 1,500
Stows 300
Kent 8,000
Ravenna 8,000
Campbellsport 50
Cuyahoga Falls 12,000
Palmyra 175
Milton 200
Talmadge 600
Brimfield 200
Rootstown 200
Edinburg 200
Diamond 175
Jackson 400
Austintown 300
AKRON 210,000
YOUNGSTOWN 160,000
Coitsville 200
New Bedford 600
East Youngstown 15,000
New Wilmington 1,000
Struthers 8,000
Edenburg 1,000
Lowellville 3,000
NEW CASTLE 60,000

Comparison of the Extent of Interurban Car and Bus Service by Pennsylvania-Ohio System

BOTH EARNINGS AND EXPENSES HIGH

That our hope in this line is justified is indicated by the fact that our Youngstown-Cleveland line produces a gross operating revenue of 44 cents per coach-mile, which is the highest revenue per mile of either car or coach in our entire operations. However, our expense on these interurban lines, due to cost of terminal facilities, the elaborate arrangements made for maintaining our schedule and the high class of maintenance upon which we insist, is far beyond any figure that I have heard or seen quoted by proponents of bus operation.

For the first three years of our operation we charged off depreciation on our coach equipment at the rate of 25 per cent per year based on four years life of the operating units. In January, 1926, the condition of our original coaches and buses was such as to indicate that the four-year life predicted was too short and we changed our basis of depreciation to five years.

It has been our experience that maintenance expenses increase steadily over the life of the coach or bus in order to maintain the same degree of upkeep. We have seen many reports of bus operation indicating handsome profits which would have a tendency to deceive the promoters since it was a first year's operation, before heavy maintenance was reached.

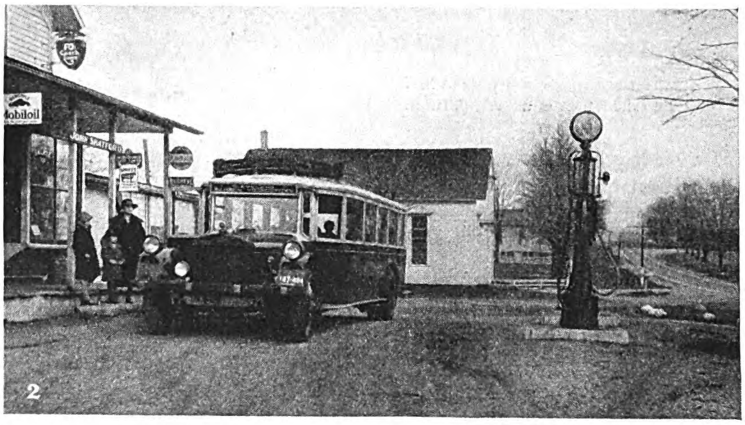
In order to illustrate this point take the operating expenses of the Youngstown Municipal Railway for its bus operation by years. These were shown in Table IV in the article in last week's JOURNAL, page 376. To get a true picture of what can be produced in this operation and strike a parity between depreciation and upkeep, if buses were to be depreciated on a four-year period I believe the depreciation should be charged off as follows: 40 per cent the first year, 30 per cent the second year, 20 per cent the third year and 10 per cent the fourth year. Including depreciation as a part of the operating expenses, the operating expenses would be practically uniform over a four-year period.

As a result of our experience, I have a few thoughts that I would like to submit to the motor bus manufacturers. The engineers seem vastly concerned about improving the design of the power plant, the shape of the combustion chamber, the contour of the heads and other refinements of this character. In our operation the maintenance of the engines themselves has never been a major problem. One of our principal worries is the matter of brakes; the largest number of interruptions to our schedule results from brakes and the largest amount of time spent in maintenance of any one item is on brakes. We have no unit in which we believe that the brake proposition has been solved. The brakes require adjustment too often, too much time is spent in relining and the job of relining is too much of a job. The use of air brakes has introduced another serious proposition and that is extraordinary wear on tires.

OPERATING FEATURES OVERLOOKED IN DESIGN

The chassis builder does not seem to be concerned about time lost in filling buses with fuel. A large proportion of our buses require ten to fifteen minutes to fill the tanks on account of flat filling pipes. Our state laws require the use of accurate speedometers. We have never had favorable results from speedometers themselves, or adapters or speedometer drives. I am the chairman of the committee on bus operation of the American Electric Railway Transportation and Traffic Association and I find that this complaint is universal throughout the industry, and have been asked to take it up with the motor equipment manufacturers in order to obtain some dependable and satisfactory means of ascertaining the speed of our units.

There have been great developments in the strength of such parts as frames, driving spindles, propeller shafts and other parts that take the strain of these heavy moving vehicles, but in our experience there is no excess strength in any unit that we operate. We do not believe that aluminum castings should be used in any chassis part where strain is to be undergone. We have had several cases of serious near-accidents due to breaking of the aluminum spiders on steering wheels.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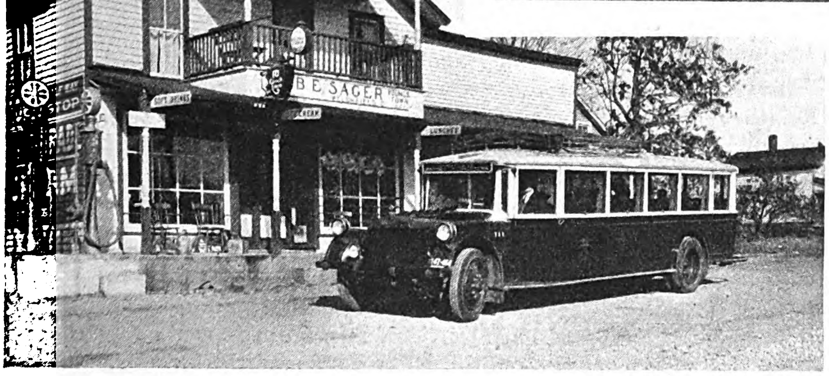


4
WARREN-SHARON COACH CO.

3
DRUGS
SODA
BUS DEPOT

Some of the Stations on the Cleveland-Warren-Youngstown Interurban Line of the Pennsylvania - Ohio Coach Company

1. Welshfield
2. Auburn Center
3. Chagrin Falls
4. Warren Terminal

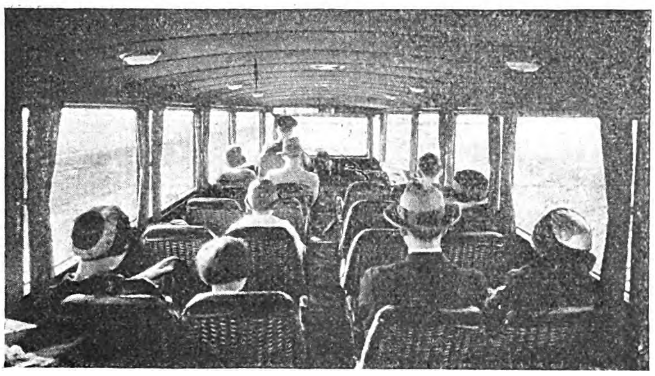
MUFFLERS INADEQUATE

It is necessary for a company operating buses and coaches to preserve pleasant public relations. More friction is developed between our company and the public with which we must live through inadequate mufflers than from any other source. In only one make of vehicle that we have used is there freedom from complaint on this source. Within the past months we have had several drivers arrested for operating with open cut-outs when we have no cut-outs on our coaches. We have been compelled to detour operations around hospitals and schools on account of noise complaints. One of the chief complaints against street railway service has been noise produced by cars. With the use of the automobile there is a chance to get away from this unpleasant factor, and yet after years of engineering on motor coaches and buses it seems impossible to have the engineering end of the manufacturing industry even give serious attention to this important matter.

Too little attention is given in coach design to safety considerations. There have recently been brought out designs in which it is impossible for the driver to see his right front fender or right curb except at some distance ahead of the vehicle. In our operation every other consideration is secondary to safety and we would never feel we were discharging our duty to the public and to our stockholders by operating a vehicle hopelessly handicapped from a safety standpoint.

Too little consideration has been given to the matter of providing for the use of chains in icy weather. I have heard it contended that certain vehicles do not need chains. We operate a great many different standard types of vehicles, and on the heavy grades on our interurban lines under the icy conditions that have prevailed this winter there have been a number of days when it was impossible to complete a trip without installing chains.

These matters are not of fundamental importance and of course will eventually be taken care of. The modern motor bus is a substantial, sturdy and useful vehicle.



From Any Seat in the Coach a Clear View of the Country Is Obtainable at All Times

On our property altogether we have 125 of them, representing an investment of nearly $1,000,000. The garages which are used by us represented an investment of $200,000 and parts and auxiliary property $150,000 additional.

Prior to our use of the bus in Youngstown there was not a single first class bus operated in the city. On our interurban operation we have purchased from time to time approximately eight operations. Only two of these owned any rolling stock that we would be willing to place in the service of the public. In the case of the two operations that did have rolling stock we could use, we paid a large part of the original purchase price to the manufacturer after we had purchased the property, notwithstanding the fact that the vehicles themselves were practically worn out.

We have increased the service substantially on every line that we have bought. We have co-operated with every independent bus operation in our territory. In Youngstown, Warren and Sharon we furnish the terminal facilities for all interurban bus lines and for a large part of the lines out of Cleveland. In co-operation with the leading independent bus lines in our territory we sell an interchangeable mileage book which enables the traveling public to ride easily and freely over northeastern Ohio. We sell through tickets from Cleveland to a great many different points in which a part of the ride is on our own line and a part of the route over independent bus lines. We have joint ticket arrangements with at least half a dozen independent bus lines that have no connection whatever with electric railway properties. We advertise their service in our schedules and in many cases extend the assistance of our schedule and traffic departments to those independent lines to help them to form their schedules and tariffs intelligently and to comply with the rather technical requirements of our public utilities commission.

COMPARISON OF INTERURBAN COACH SERVICE AND INTERURBAN CAR SERVICE PENNSYLVANIA-OHIO SYSTEM—YEAR 1926

	Coaches	Cars
Number operated	29	27
Revenue	$584,116.54	$661,943.73
Mileage	1,910,940.58	1,743,553.10
Revenue per mile	0.305	0.382

ALL COACH LINES LEAD TO THE
PALACE
B.F. KEITH
CLEVELAND, OHIO
COACH
TERMINAL

The Cleveland Terminal of the Cleveland-Warren-Youngstown Coach Line Is at 2133 East Ninth Street, Not Far from the Center of the Business District

If our history and attitude is in any manner typical of that of the electric railway industry, there certainly is every reason for co-operation between the electric railway industry and the great manufacturing industry furnishing bus equipment.

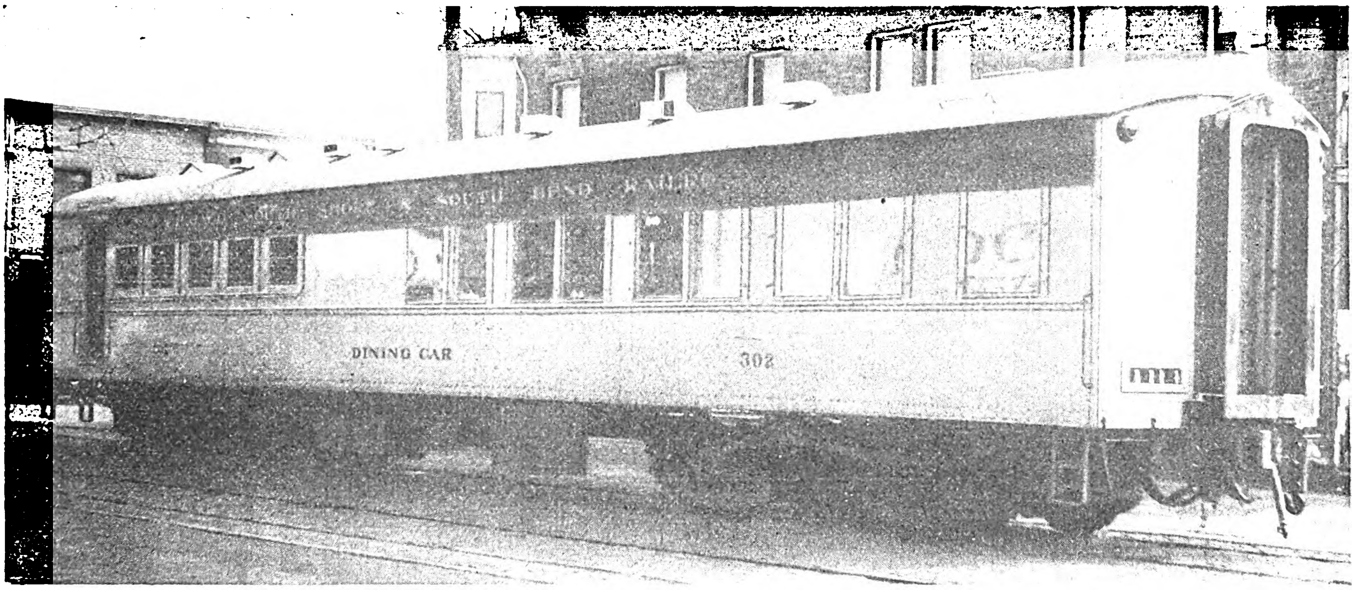
McClintock Recommends Laws Against Slow Driving

ESTABLISHMENT of minimum as well as maximum speed limits is recommended by Dr. Miller McClintock, director of the Albert Russel Erskine Bureau of Street Traffic Control, to help relieve the growing traffic congestion in American cities. While excessive speeds are condemned as causes of delay and oftentimes accidents, Dr. McClintock suggests that minimum speed regulations be made of about 50 per cent the maximum on busy arteries. In discussing this problem Dr. McClintock said:

"Drivers who insist on holding up traffic to a snail-like pace of 5 or 10 m.p.h. on important streets should be subject to a certain amount of legal prodding. When streets are filled with vehicles the slow driver regulates the speed of all following traffic and by his selfishness or carelessness often delays hundreds. Slow drivers are also the unwitting cause of many accidents by making it necessary for overtaking motorists to cut into the opposing traffic stream to pass."

The Erskine Bureau has completed an extensive survey of street traffic in Chicago which discloses a typical set of obsolete laws, that according to the report were obsolete ten years ago. "Their chief service," says Dr. McClintock, "is to permit technically inclined public officials of some of the small cities of the Chicago region to levy unwarranted toll on the motoring public."

One of the recommendations in the Chicago survey abstracted in the ELECTRIC RAILWAY JOURNAL Jan. 8, 1927, will be to urge the state legislature to pass laws that will permit the city to enact ordinances regulating minimum as well as maximum limits on the streets.



This Exterior View of the South Shore Line's New Diners Vies in Beauty with the Interior of the Car. Streamlines and the Orange Color Enhance the Mechanical Perfections

South Shore Line Starts Dining and Parlor Car Service

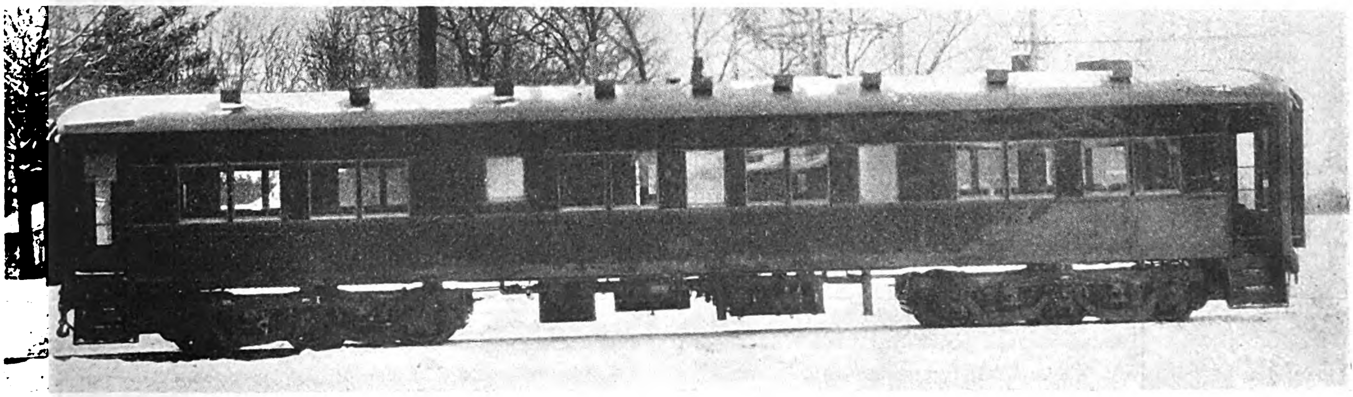
Pullman Built Equipment Now Operating Between Chicago and South Bend, Ind., Provides Most Modern Facilities and Comforts for Windy City Passengers—Seven Thousand View Cars During Six-Day Exhibit Trip

REGULAR operation of the new all-steel parlor-observation and dining car equipment of the Chicago, South Shore & South Bend Railroad between Chicago and South Bend, Ind., was inaugurated on Feb. 20, following a six-day exhibition of a train made up of the four new cars in the larger towns along the company's lines. The number that visited the cars during the public showing was estimated at more than 7,000 persons.

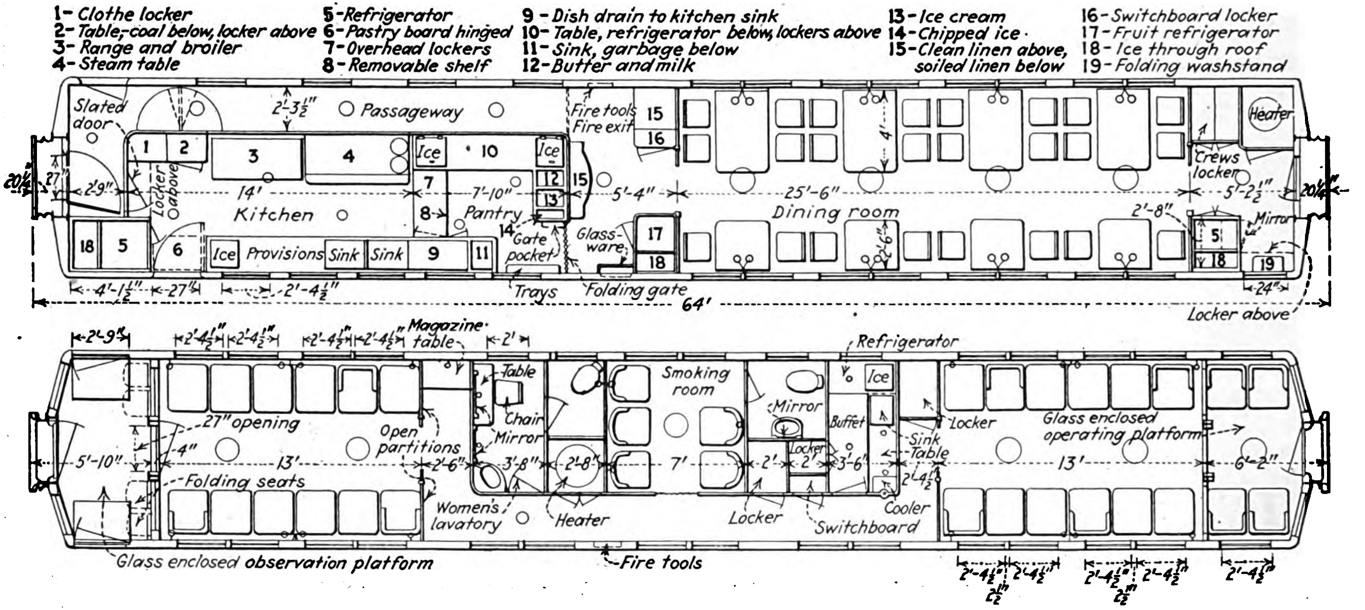
Names significant from the standpoint of the localities served have been chosen for the three dining car and two parlor-observation car trains that now operate in each direction daily. The dining car trains leaving Chicago at all mealtimes are known as the "Notre Dame Limited," "Indiana Limited" and "St. Joe Valley Limited." Parlor-observation trains in this direction in the forenoon and mid-afternoon are the "Duneland Limited" and "Marquette Limited."

The new cars, which were built by the Pullman Car & Manufacturing Corporation at a total cost of $185,000 and delivered to the railroad late in January, are of standard steam road Pullman car dimensions. Each car is equipped with six-wheel trucks, said to be the first of their type operated on any electric railroad in this country.

Finished with walnut woodwork, the parlor cars, 64 ft. x 10 ft., have glass-inclosed platforms at each end; they are furnished with comfortable folding chairs, and are heated by automatic electric radiators, while full-length windows afford an unobstructed view to the rear. The cars are arranged with the men's and women's lavatories, kitchen, switch cabinets and other appurtenances in the center, thus providing a parlor compartment at each end, next to the observation platform. A built-in writing desk and magazine table is located in each compartment. Every comfort has been provided



Exterior of South Shore Line's New De Luxe Parlor-Observation Car Showing Six-Wheel Truck Innovation and Glass-Inclosed Observation Platforms


1- Clothe locker
2- Table; coal below, locker above
3- Range and broiler
4- Steam table
5- Refrigerator
6- Pastry board hinged
7- Overhead lockers
8- Removable shelf
9- Dish drain to kitchen sink
10- Table, refrigerator below, lockers above
11- Sink, garbage below
12- Butter and milk
13- Ice cream
14- Chipped ice
15- Clean linen above, soiled linen below
16- Switchboard locker
17- Fruit refrigerator
18- Ice through roof
19- Folding washstand
Passageway
Kitchen
Pantry
Provisions
Dining room
Fire tools
Fire exit
Glassware
Gate pocket
Trays
Folding gate
Crews locker
Heater
Mirror
Locker above
64'
Magazine table
Refrigerator
Smoking room
Table
Chair
Mirror
Buffet
Ice
Locker
Sink
Cooler
Switchboard
Glass enclosed operating platform
27" opening
Open partitions
Folding seats
Women's lavatory
Heater
Glass enclosed observation platform
Fire tools

Great Care Has Been Exercised to Arrange the New Cars Conveniently. Above, the Diner; Below, the Observation Car

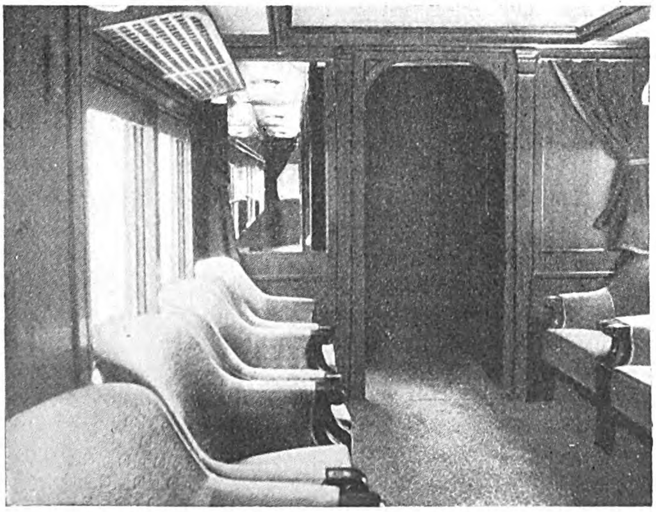
for feminine passengers in the women's retiring room, which is attractively furnished with a small boudoir table, a full-length mirror and several smaller mirrors. Special care also has been exercised in equipping the men's lounging room.

Designed for buffet service only, the kitchen is a model of compactness. In its small area an ice box, sink, electric heater, humidor, water cooler and various cupboards are included. Among other interior decorations are dome ceiling lights, handsome side fixtures, two large electric fans and deep plush carpets.

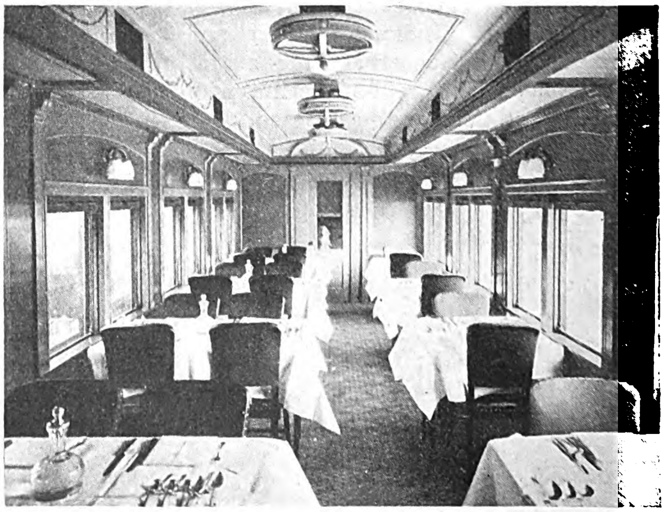
Longer than any equipment now in service on the South Shore Line, the new diners, 64 ft. x 10 ft., are designed to serve 24 persons at a time, the seating arrangement conforming with that in vogue on the steam roads. The color scheme for the interior is green, decorated enamel, which is enhanced by dome ceiling lights, plush carpeting, and individual lighting fixtures over the tables. The kitchen compartment is designed for the maximum speed in serving, and besides the customary range there are several refrigerators, cabinets for linen, china, silver, provisions and fruits, three sinks and several large electric fans. Egress and ingress are obtained through centrally spaced doors as in the case of the steam road equipment. Rounded ends, streamlines and the striking orange color, standard for the South Shore, are some of the exterior features.

More than 125 newspaper men, city officials and other prominent residents of South Bend, Michigan City, Gary, Chicago and other cities reached by the South Shore Line were guests of the company on an official inspection tour in the new cars on Feb. 10. Aboard the train were Britton I. Budd, president of the railroad; B. J. Fallon, C. E. Thompson and H. M. Lytle, vice-presidents; Charles H. Jones, general manager, and other officials of the company and affiliated railroads and Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL. The new de luxe limited trains now supplement the regular hourly express service between Chicago and South Bend and the half-hourly service between Chicago and Gary.

Incidentally, since the South Shore line has been under the control of the Insull interests, during the last two years $4,500,000 has been spent in rehabilitation of the property and an additional $2,000,000 will be spent in the next twelve months. Twenty-five new steel passenger cars have been placed in service and twenty more cars will be added during the summer.



Interior of Parlor-Observation Car Which Reveals Corridor Around Butler's Pantry and the Lounging Rooms for Male and Female Passengers



Dining Car Patrons Will Now Enjoy the Modern Appointments as Shown in This Interior Perspective. Decorated Green Enamel Is the Color Scheme

Headway Recorders Centralized in Dispatcher's Office at Denver

By Nelson R. Love

Chief Engineer Denver Tramway, Denver, Col.

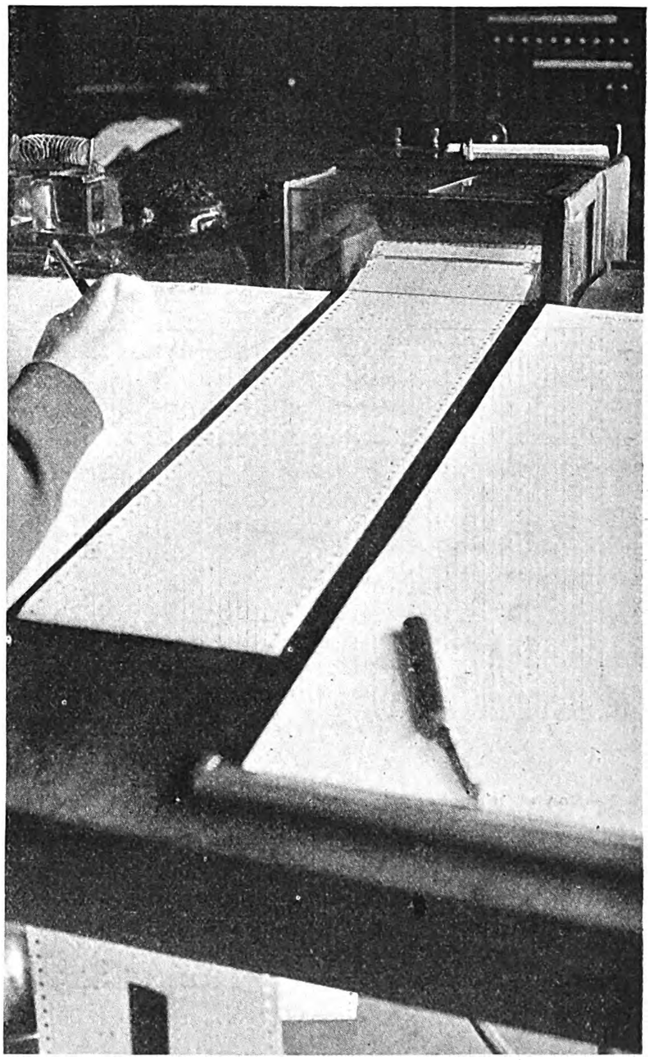
Continuous Check Provided on Operation of Ten Car Lines—High Voltage Spark to Burn Paper Is Used Instead of Ink—Single Wire Suffices for Registering in Two Directions

HEADWAY recording apparatus, arranged to register separately the time inbound and outbound at which cars pass given points on ten lines, has been installed in the dispatcher's office of the Denver Tramway. This centralization of equipment permits a continuous check-up by the dispatcher. Each route of the Denver Tramway is equipped with a telephone connecting with the dispatcher's office, located at approximately the center of the system. Cars are operated on printed schedules that are in the hands of all trainmen, but if any car is more than three minutes late the motorman reports to the dispatcher at the end of the line. Thus the dispatcher is able to issue such orders as may be required to operate the line to the best advantage under the circumstances. The method of dispatching used in Denver was given in detail in an article in this paper for Aug. 23, 1924, page 275.

For recording headways the apparatus used is a continuous strip-chart type of instrument, with spaces for twenty indications. One is used for the outbound cars and one for the inbound cars on each of the ten lines at present connected. The chart speed is 6 in. per hour, or 0.1 in. per minute, making one-half minute variations in time readily distinguishable. An accompanying illustration shows the arrangement of the headway recorder on the dispatcher's desk. It will be noticed that the chart passes over the top of the desk with approximately three hours of chart visible at all times. The dispatcher marks the schedule time for each car in red on the chart as it passes over his desk, thus showing up immediately every car not on time.

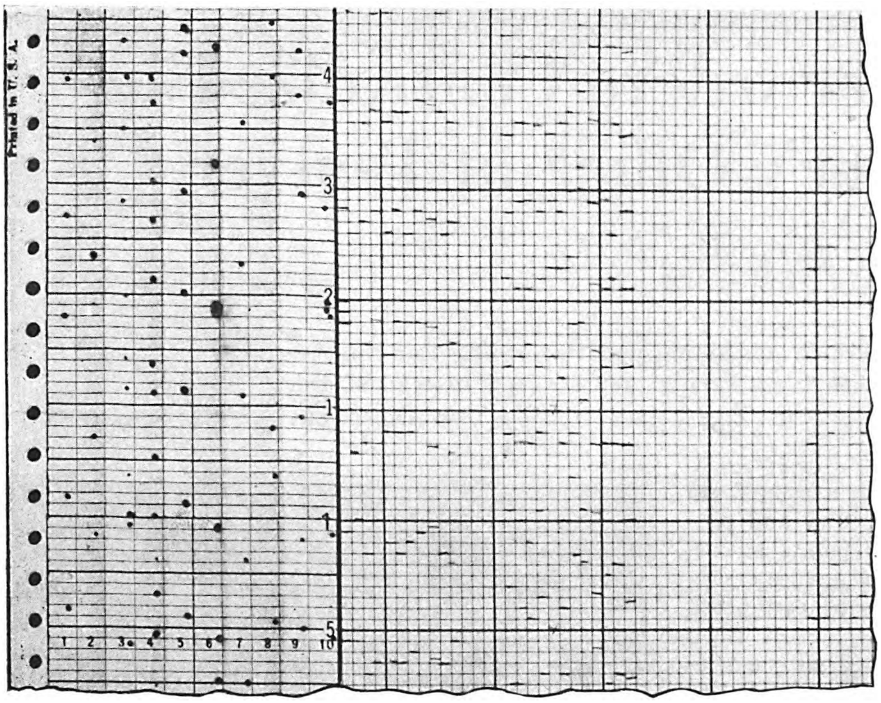
The time scale employed on the chart renders the transfer of the daily chart record to a comparative line record a simple matter by using standard cross-section paper ruled ten lines to the inch in sheets 20 in. wide by 9 ft. long. This sheet suffices for recording 90 days' performance of one line, showing Saturdays, Sundays and week days, inbound and outbound, separately at the right. A portion of one of these records is reproduced. The mark at the extreme left of each series of days is the time at which the car is due.

One clerk is able to take care of all of this work. The process of transferring the record consists in folding the original chart so that the line desired is at the edge. This is laid on top of the permanent record, alongside of the column for the day involved, and the time scale matched properly. The clerk then makes a mark for each mark on the chart, without reading or interpreting either the original or the new mark. About twenty minutes is required to transcribe the record for one line for one day.



Chart, on Which Are Registered the Headways on Ten Car Lines Operated by the Denver Tramway, Passes Over the Dispatcher's Desk

As originally set up, the recorder used capillary pens, each pen tracing a continuous line on the chart, and each car passage causing a horizontal offset to appear in the line. On account of passing over the dispatcher's desk, this method of marking the charts proved unsatisfactory. Various combinations of ink were tried. Oil would not dry at all. Water dried so quickly that the pens clogged. Alcohol made the ink run so freely that it dripped. Glycerine and water did fairly well, but would not dry completely. When the glycerine con-



Original Headway Record Made by Electric Spark (at Left) Placed Alongside a Large Sheet of 1-In. Cross-Section Paper (at Right) for Compilation of the Comparative Chart

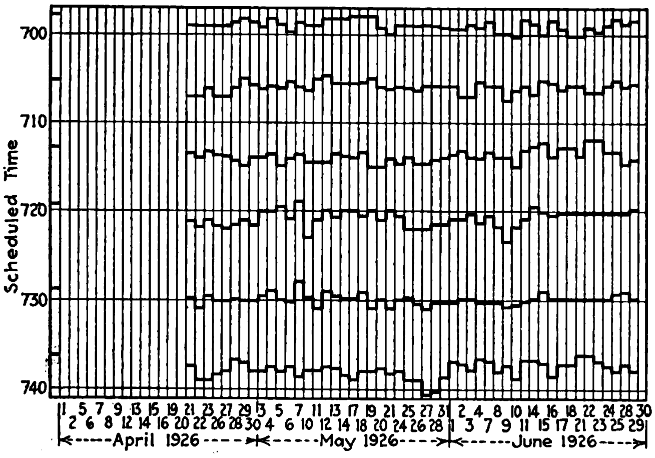
tent was kept down, the paper buckled from expansion, and so on. Finally the use of ink was given up entirely and an automobile spark coil was pressed into service. This has operated with no trouble whatever, each car passage being registered by a small round hole burned in the chart. It has black edges and so is readily visible on either a white or black backing.

The paper drive is operated electrically with a contactor on the pendulum of the master clock located in the dispatcher's office. This insures synchronism of time by which cars are dispatched and the record made by the automatic recorder. The master clock being a high-grade instrument with a mercury compensated pendulum, the error in the chart drive is only a few seconds per week. This is much smaller than the accuracy with which the chart can be read, and is not cumulative, as the paper chart must be renewed and the chart set anew each week. The driving mechanism consists of a 60-tooth ratchet wheel driven by an electromagnet energized once each second by the master clock. The ratchet wheel moves forward one notch upon release and is geared to the paper drive roll to give a chart speed of 6 in. per hour.

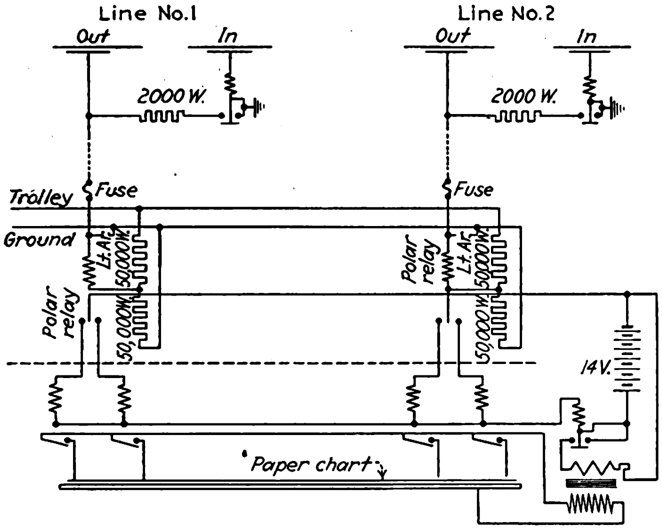
An interesting feature of this installation is the transmission of separate indications for outbound and inbound cars over the same wire. This is done by a polarized relay of telephone type at the recorder end of each wire. Current in one direction closes one contact, and current in the opposite direction closes another contact, operating the recorder itself with a local battery. Reversal of current is secured by connecting one terminal of the relay coil to the midpoint of a 100,000-ohm resistance between trolley and ground. The other relay terminal is connected to the line wire. Outbound cars connect the distant end of each line wire through a trolley pan direct to the trolley. Each inbound car operates a relay from a trolley pan connection, which in turn connects the line wire to ground. In order to prevent short circuit in the event that outbound and inbound cars of the same line strike pans at the same time, a resistance is connected between the trolley contact and the ground contact. This limits the current to about 0.25 amp. in such an event and does not interfere with the sensitive polarized relay used. Lightning protection to each polarized relay is provided by a vacuum type of spark gap arrester, with fuse in the line wire.

The spark to burn the indications in the chart is provided by a Ford spark coil. Its primary circuit is closed by a relay connected in the common local wire to the polarized relays, so that when one of the latter is operated the flow of local current causes a spark hole. The spark is distributed to the proper position on the chart by using the pens of the chart as relays to close the proper high-tension circuit through the appropriate spark gap, utilizing the movement of the metal pen to close a gap in the circuit.

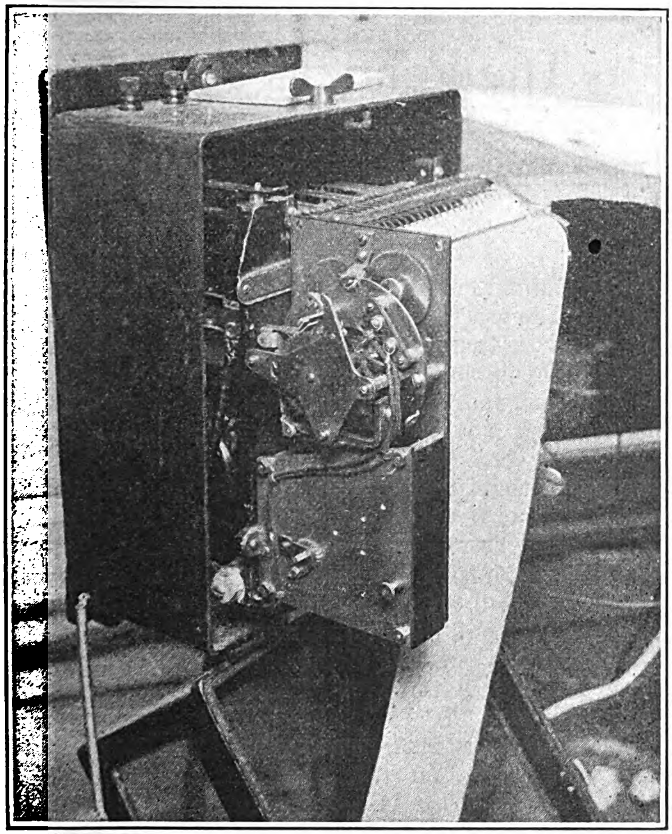
One coil serves for all indications. If two cars were



Portion of Weekday Headway Record for One Line in One Direction for Three Months. The Schedule Time of Each Car Is Shown at the Left



Wiring Arrangement by Which Inbound and Outbound Cars Register Over the Same Wire



Driving Mechanism for the Headway Chart Is Actuated by the Master Clock in the Dispatcher's Office

to cross contactors at exactly the same time, and for the same duration, only one indication could result. The chances of this happening, however, are extremely remote. Up to the present this never has taken place. Though two indications have been observed to come in so close together that the coil relay closed only once, two separate indications have always resulted. The wiring diagram for the polar relays, spark coil and recorder coils is reproduced herewith.

An inexpensive 14-volt storage battery supplies local current for all purposes, namely, paper drive, spark coil and recorder coils. This storage battery is charged continuously at a low rate by an electrolytic type of trickle charger, so that the storage cells used are of very small capacity. This battery has given excellent service and found to be ample for the requirements.

First Electric Railway in Oklahoma Celebrates Birthday

THE Oklahoma Railway on Feb. 3 celebrated the 25th anniversary of establishment of street car service in Oklahoma City, Okla. The Metropolitan Railway, which afterward became the Oklahoma Railway, was the first electric railway established in Oklahoma. It started with less than 6 miles of single-track railway and has expanded until it now has 65 miles of track within the city limits as well as interurban lines.

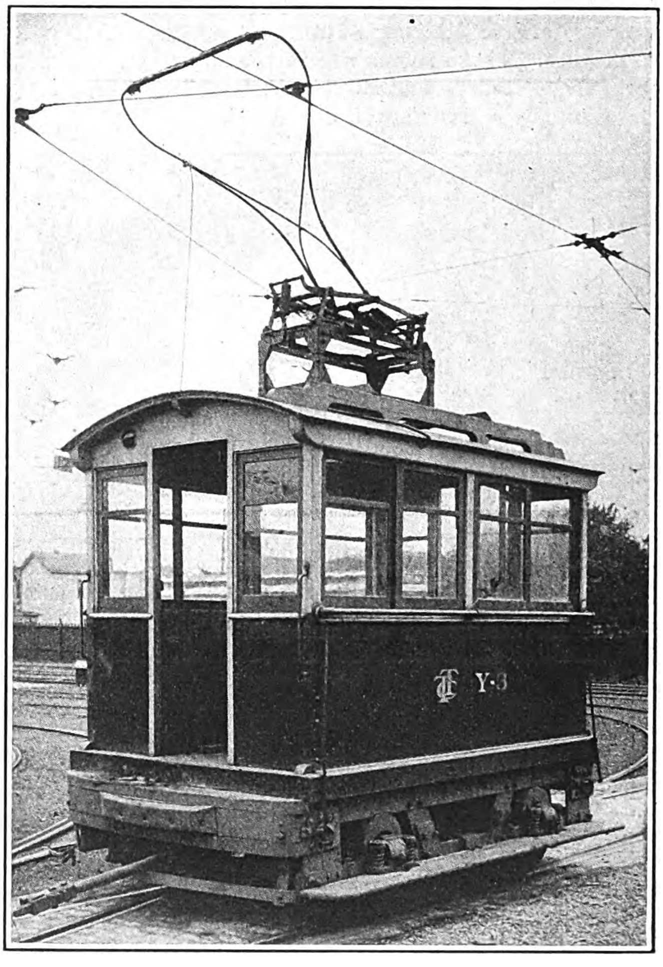
Lawrence Paulson, veteran operator, now on the El Reno interurban line, was at the helm of the first street car that operated in Oklahoma City 25 years ago. The city declared a holiday to see the strange phenomenon. Crowds lined the streets and cheered. Bolder spirits swarmed inside and others, unable to get inside, climbed to the roof and hung their feet over the sides.

Automatic Reversing Bow Collector

One-Man Operation of a Small Shifting Locomotive Has Been Made Possible by Designing a Bow Trolley that Will Reverse Automatically

FOR handling passenger trailers in the yards and shops, the Toronto Transportation Commission uses a small locomotive which is called a "shifter" or "shunter." This railway operates 258 trailers in its passenger train service. Due to the number of these it has been found most economical to have the special car, since the movements are usually quite short and reversing is very frequent.

An automatic reversing trolley was found desirable so that the locomotive could be operated by one man. As a result, the car is equipped with a bow collector of quite novel construction and quite different from the usual form of pantograph. When the car is reversed the direction of the bow collector automatically changes without breaking contact or without attention from the operator. In changing from one position to another, the supporting mechanism, which is ordinarily held in operating position by springs, is caused to depress against the spring action and thus provides space so that the bow collector will reverse and still keep uniform contact against the trolley wire at all times.



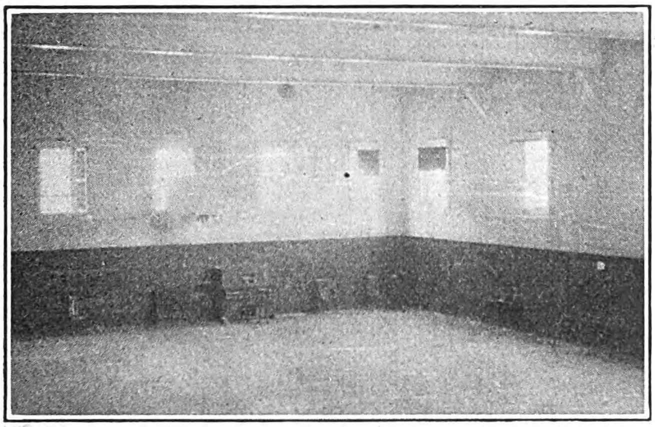
The Bow Collector Is Shown in the Trailing Position on the Car Used for Shifting Trailers

The use of a collector of this type has several advantages over the ordinary collector for this particular type of work. The locomotive is used only to shift trailers. The fact that the collector cannot leave the trolley wire results in a considerable saving in time, labor and maintenance, since it is unnecessary to have a second man to handle the trolley pole.

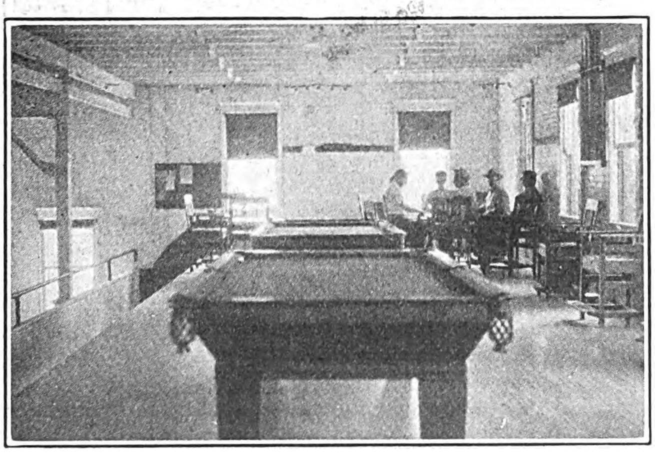
Some minor changes were necessary in the overhead construction in order to provide for the use of this bow collector. It was necessary to have the trolley wire at quite uniform height and this does not vary by more than a foot between highest and lowest positions. It was also necessary to reverse the single and double-curve pull-overs, so that none of the overhead would be below the plane of the trolley wire. The standard trolley frogs, cross-overs and section insulators work equally well with the bow collector as with the standard trolley wheel.

Huntington Completes New Trainmen's Rooms

NEW quarters designed to provide means for recreation in off hours have been provided by the Ohio Valley Electric Railway, Huntington, W. Va., for its employees. These rooms are in the same building with the general offices and directly across the street from the company's Huntington car station.



A Corner of the Main Floor Used for Basketball and Assemblies in the Recently Completed Trainmen's Quarters of the Ohio Valley Electric Railway at Huntington, W. Va.



On the Balcony of Huntington's New Rooms Devoted to Trainmen Are Pool and Card Tables. To the Left Are Seats Overlooking the Main Auditorium Floor.

A large room that can be fitted out as a gymnasium is provided for basketball, dancing and other general assemblies. On a balcony at one side pool tables are provided and several rows of steps or seats which will accommodate a small audience.

The Readers' Forum

"Motormen's Badges Are Poor Advertisements for Heavy Interurbans"

SAN FRANCISCO, CAL., Feb. 26, 1927.

To the Editor:

Years ago practically all interurban electric lines were nothing more than extended street car roads, frequently using city equipment. No one seriously regarded them as main line railroads. The steam roads thought them more or less a joke. Some of these interurbans, however, have changed with the years. They have come to realize that their service and equipment must be brought up to the standard of the steam railroads.

Changing from extended street car line to heavy electrified main line has cost many millions of dollars. Street car methods were dropped, because the public would not stand for a street car on a 50-mile run. But, strange to say, one relic of the past has remained. His name is Mr. Motorman, or "Scissorbill," as the steam roads call him.

Generally he is made conspicuous by a badge. If a sign were painted on each interurban coach, sleeper or diner reading, "This is a street car line," it wouldn't have any worse effect on public opinion than does the motorman's badge. Why? Simply because "motorman" is a street car word. It is out of place in heavy interurban service. The public is used to coupling the word "engineer" with railroads. If electric interurbans would use the title when referring to their motormen it could not but be beneficial.

Almost any one can be a "motorman" after a couple of weeks training, but a locomotive engineer is different. The public has learned that he is a highly trained man, and he is. It takes almost as long to train an interurban motorman as it does a steam railroad engineer, but few people know this, because they usually think of only one kind of motorman—the street car motorman.

Personally, whenever I ride on one of the electric lines that designates its trainmen as "motormen" I cannot help but wonder how safe the man is, or how long since he was promoted from city service. Surely if this feeling is shared by many, a motorman's badge is not a good advertisement. I believe it would be a good idea for the heavy interurbans to abolish the motorman's badge and adopt an engineer's badge. That is the practice in the West on heavy interurban lines owned by steam roads.

If the steam roads can designate a man as "engineer" at the controller, so can the electric lines. Many of the latter have abolished the blue uniform for interurban motormen and adopted in its place a locomotive engineer's outfit—overalls and jumper. Motormen on such lines haven't swelled up and asked for more pay. Neither would they if they had engineers' badges. Interurban motormen, as a rule, are highly intelligent men and they do not expect standard steam road pay, but they do not like to be known as motormen, as I have found out by talking to several of them.

I believe also the use of gongs in motormen's cabs instead of air whistles cheapens the road in the eyes of the public. Ding! Ding! let's go, street car! The street car foot gongs are bad; use the air whistle and be a railroad. A locomotive bell attached to the roof is another good thing to dispel the street car impression.

AN INTERUBRAN PATRON.

Older Cars Should Not Contrast Too Greatly with Recent Purchases

UNION STREET RAILWAY
NEW BEDFORD, MASS., Feb. 10, 1927.

To the Editor:

If we are to continue to exist as a transportation agency, and I firmly believe that we are, we must devise methods of attracting more patronage to our vehicles. Economical operation, while in itself of great importance, is not derivative of increased gross incomes. Our vehicle, whatever its kind, must be sufficiently attractive to invite patronage. Otherwise individual transportation units are bound to be used. One way to secure this increased patronage is by the operation of modern, attractive rolling stock. Careful consideration of modern cars makes one realize that they produce more intangible than tangible benefits. Even though up-to-date cars may not bring immediate large increased receipts, it is certain that the continued use of old, untidy cars will not encourage new traffic and will, as a matter of fact, discourage more and more of the present riding.

The general public is not willing to buy the same kind of merchandise for any length of time. Styles are continually changing and merchants are constantly endeavoring to satisfy the demands of their public. With this desire for new things uppermost in the minds of our patrons, it is no wonder that they expect us to improve and there is no better way of calling our improvements to their attention than by keeping our rolling stock up to date. The private automobile has taught people to enjoy a more comfortable method of transportation, and if we are to encourage this class of patronage we must appeal to them from the standpoint of service and comfort, as well as from the economical side of the question. Street cars are of a size and construction that afford greater opportunities for producing a more finished piece of workmanship than is possible to obtain in the smaller transportation units.

In New Bedford attractive and efficiently maintained rolling stock has done more to develop a spirit of friendly co-operation between the public and the company than any other individual item. For years cars have been painted or varnished every year, and a very thorough system of cleaning has been followed closely. No matter how attractive and comfortable new cars may be when delivered, their benefits will be short-lived if not accompanied by a very thorough system of maintenance and cleaning. Plush seats will not remain attractive very long unless they are cleaned nearly every day. It is also important that our de luxe improvements should be practical and easy to keep clean, as well as be attractive.

New appliances have been added from time to time to the existing rolling stock in New Bedford, so that there is not a great contrast between the older cars and those recently purchased. The public judges a railway's physical condition more from its complete complement of rolling stock than from a few pieces of equipment that were recently purchased.

It has been our endeavor to have our cars operate as quietly as possible and as a means to this end we have given special attention to the proper maintenance of our car trucks. Bearings, gears, wheels, journal boxes, brake riggings, etc., have been inspected and repaired constantly so that they would not produce rattles when the car was in motion. The track has also been efficiently maintained so as to give a very smooth ride; in many instances smoother than that obtained by the best of motor coaches.

In the last analysis it remains for the "men who man the cars" to sell our "product." The training and supervision of this personnel is very important, and the use of a modern training school, full-time instructor and several supervisors have played an important part in developing an efficient corps of transportation salesmen. Friendly co-operation and a thorough follow-up have been the secret of our success along this line.

HAROLD E. POTTER,
Assistant Superintendent of Transportation.

Popular or Mass Transportation?

MOUNT VERNON, N. Y., Feb. 16, 1927.

To the Editor:

'Twill be recalled that when Miss Julia Capulet learned that her Romeo was of the hated Montague clan, she cried: "What's in a name—a rose by any other name would smell as sweet."

So does one feel with regard to the efforts being made to foist new words on the public in cheerful disregard of the fact that most really popular words like "trolley," "jitney," "wow" and "movies" are the inspiration of the man in the street and not the perspiration of the press agent in the office.

You can call a morgue a "mortuary chapel," but the corpse is just as dead in his "casket" as in a coffin. The slithering wight who dresses him for eternity is still an undertaker or funeral director rather than a something rhyming with logician and mathematician.

A barber is still a hair-cutter who barbs and bobs—not a person addicted to tonsils. The alligator pear will taste no sweeter for being called by a name suspiciously like "advocate" in Spanish. And now the dentists want to be called gnathists, which makes us gnash our teeth.

A bus is a bus and a coach is a coach despite the effort to identify a lower form of street car with the luxury of an enlarged limousine.

Coming still closer home, know ye that since the horse car disappeared the ELECTRIC RAILWAY JOURNAL has tried to encourage the use of "carhouse" or "car station" for "carbarn," but even the younger generation sticks to "barns."

It may be that "mass transportation" carries implications of wretched service and poor equipment. However, in the writer's judgment, this term is rather a technical one used among ourselves to express the handling of business *en masse* as distinguished from transportation of small groups at special fares and under special conditions. To substitute "popular" for "mass" would rob the term of its precise meaning. Which is more popular if you have the price: A public utility car or bus, or a private motor car? Let us say directly to the public: "This Is Popular Transportation" only when we are doing something to make it more beloved, whether in fares, in service or in quality of equipment. This writer, for one, sees infra-red when a high-falutin' name beplasters a low-down object. Shades of "Euphues"!

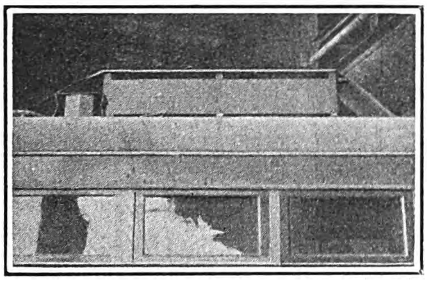
WALTER JACKSON.

Maintenance Notes

> *Neglect your maintenance, and equipment upkeep,*
> *And you're on the "One Way Street," to the scrap heap.*

Motor Rheostats Installed on Car Roofs

MAINTENANCE of motor rheostats was a large annual expense to the Jamestown Street Railway, Jamestown, N. Y., until J. L. Conner, superintendent of motive power, removed them from beneath the car and reinstalled them on the roof. Broken grids and grounded rheostats were a source of continual trouble when the rheostats were located beneath the car. Although suitable splash guards were installed between the rheostats and the truck wheels, the mud and water entered, causing insulation breakdowns and burnouts, with resulting road delays. Also foreign particles were being continually picked up and deposited against the grids, causing breakage.

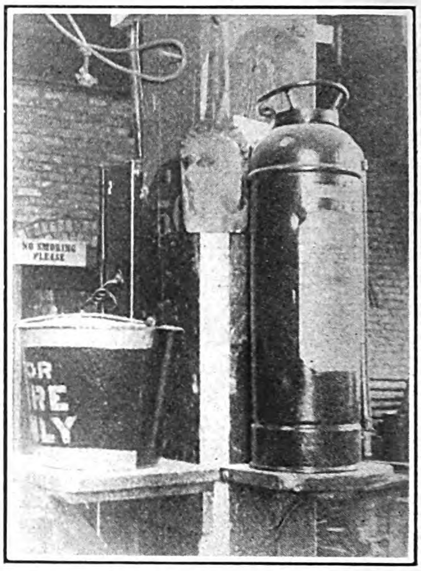

Trouble with Resistors Has Been Eliminated by this Car Roof Mounting in Jamestown, N. Y.

To eliminate this source of failure the rheostats have been reinstalled on the roof of the car. They are mounted on a piece of 1-in. asbestos lumber, fastened to the trolley board through suitable porcelain insulators. Protection from the elements is afforded by $\frac{1}{16}$-in. sheet metal plates fastened securely to 2-in. vertical steel angles, forming a box around the rheostat. These angle posts are bolted to the trolley board. The side plates are so installed as to permit of free air circulation and heat dissipation by leaving openings near the top plate and the trolley board. The cover plate is fastened to the vertical post. It is sloped to cause deflection of rain and snow.

The cost of labor and material was approximately $50 per car. The company claims that these rheostats have not needed a penny of maintenance expense since they were installed in their new location, and therefore they consider the expense of the installation was a very good investment.

Fire Equipment Location Shown by Striking Colors

LOCATIONS of fire extinguishers and sand pails in the shops of the Grand Rapids Railway, Grand Rapids, Mich., are painted red with a yellow border. These colors can be seen at a considerable distance and are sure to attract attention. Each fire station is numbered and a man is assigned to each particular station. For convenience, many of these are located on posts throughout the building. An accompanying illustration shows such a fire station.

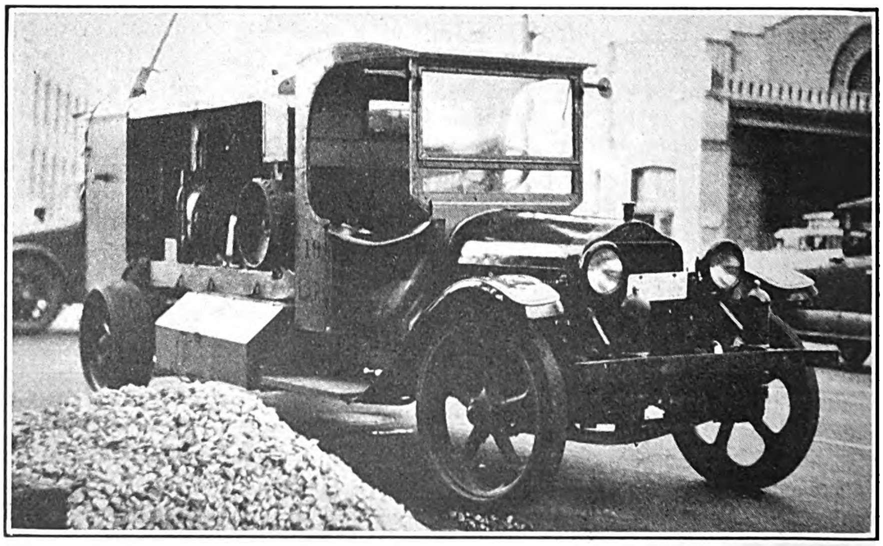


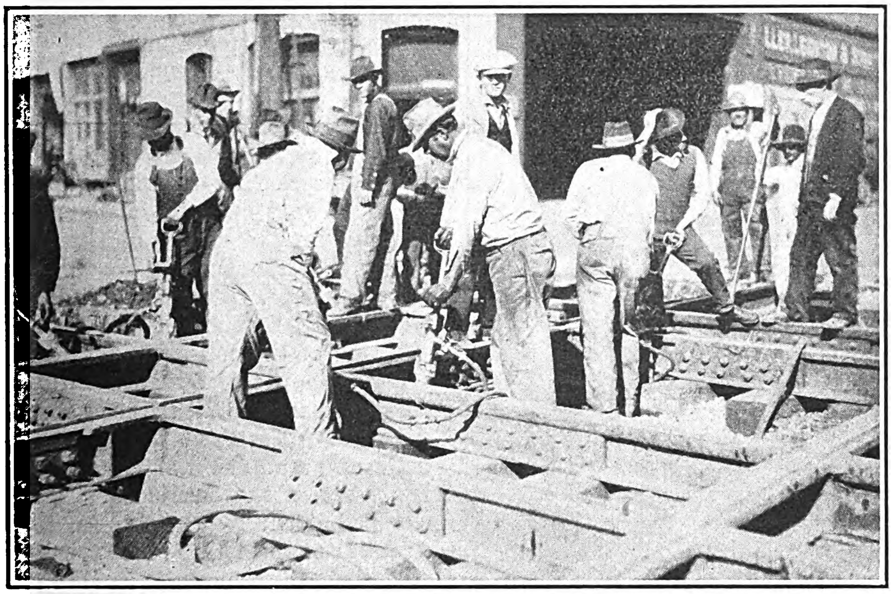
Fire Station Located on Central Posts in the Shops of the Grand Rapids Railway

In this case the number for the fire extinguisher is 55 and that for the sand pail 56. A small shovel is also used as part of the equipment for spreading sand.

Compressor Outfit on Bus Chassis

USE is made by the Los Angeles Railway of a standard White 15-45 bus chassis for mounting a large size portable air compressor outfit. The chassis, about to be scrapped by the bus department, was reclaimed by the way and structures department and with some minor modifications fitted for its new duties. Additional springs were placed on top of the regular springs at the rear. The pneumatic tires and wheels were replaced with solids of the same type as those used on double-deck buses.


Portable Compressor Outfit Assembled in Bus Chassis by Los Angeles Railway. Boxes on the Sides Hold Various Air-Operated Tools.



At Work with Air-Operated Tamping Tools on a Double-Track Crossing. The Air Used Is Furnished by the Portable Outfit Mounted on Bus Chassis

The compressor unit, consisting of an Ingersoll-Rand 245-cu.ft. pump driven directly from the trolley by a 600-volt motor, is carried on a channel sub-frame. This in turn is fastened to the main frame. The size of the chassis allows for a generous spacing of the several parts as well as the installation of tool boxes on the sides and a hose reel on the rear. This reel is inclosed in a sheet metal cabinet having double swinging doors which open to the rear. About 200 ft. of air hose can be carried on the reel, which has a diameter of 18 in. and a length of 30 in. with 30-in diameter flanges at the ends. The shaft of the hose reel extends through the side of the cabinet to take a cranked handle for winding in the hose.

On top of the outfit is carried a folding arm for making contact with the trolley. This is made of 3-in. x 2-in. ash jointed about 6 ft from its upper end. It is fastened to the top rear edge of the hose reel cabinet by a bracket and pin. The point of attachment is about 3 ft. from the lower end. The pin allows the boom to be raised by depressing the end which extends to the rear. The upper end is fitted with a piece of bare trolley wire, which is connected through jumper cable to the controller of the motor.

When down, the boom is folded back on itself and rests on a bracket support on the roof at the forward end of the compressor outfit. On the job, the folded boom is raised, the upper portion extended by a rope and the bare contact wire placed against the trolley. The weight of the boom maintains the contact.

Tool boxes on the sides are made of ¾-in. wood sheathed with sheet metal. They are of such size as to hold conveniently the air tools used for tamping ballast and other operations for which the air outfit is used. The metal covering protects the boxes and also gives a finished appearance.

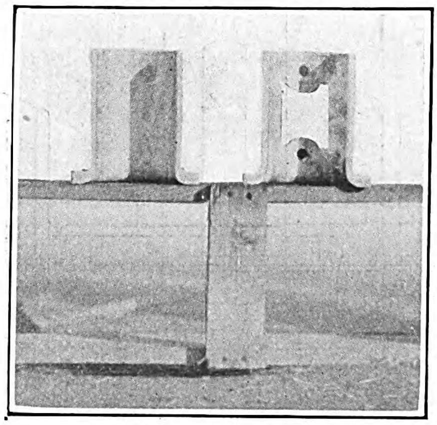
Another feature of the installation is the air-distributing manifold with its six operating outlets. A piece of 2½-in. pipe is brought out of one end of the air tank and carried in a double bend back to the compressor frame base. Here the manifold, made of 3-in. steel tubing, is supported by brackets on the base of the compressor. The supply pipe enters one end of this manifold. The other end is closed. The service outlets, spaced on about 4-in. centers, leave the top of the manifold. A valve controls each outlet.

This installation on a bus chassis has proved so satisfactory that the department now has under construction an electric track welding outfit on a similar chassis.

Axle-Bearing Maintenance Decreased

CAREFUL analytical study of motor axle-bearing maintenance expense on the Danville Traction & Power Company, Danville, Va., indicated that a very appreciable saving could be obtained if a bearing having a high percentage of zinc was adopted as standard.

The annual expense of axle-bearing maintenance formed a major portion of the total annual motor expense, as considerable trouble was experienced with axle-bearing breakage. Practically all of these broken bearings had to be scrapped and new bearings substituted. Some of these broken bearings were practically new, whereas others were only half worn out. Nevertheless, it was found necessary to scrap them due to the character and location of the breaks and the expense of making repairs.

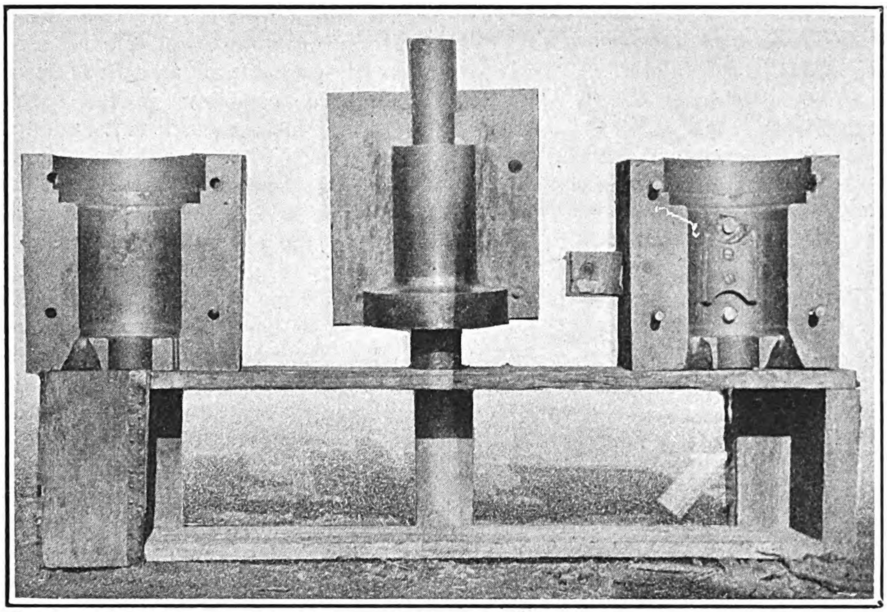


Set of Composition Axle Bearings Removed from Mold and Ready for Service

Experiments were started on the axle bearings of the GE-265 motor. A three-section steel mold was made in the shop. Careful consideration was given to the expansion and contraction factors of this mold, together with the shrinkage of the bearing metal, in order that a bearing could be removed from the mold and placed in service without any machine work other than slight filing of the edges. This mold is of rugged construction and is provided with heavy straps and dowels, so that the parts are held together accurately when assembled for the pouring of the metal. Provision is also made for casting the bearing waste window and dowel holes.

Bearings with various combinations of zinc, copper, tin and aluminum were cast and tested in service. After several trials, it was decided that the most satisfactory composition for toughness, nonbreakage and long life was 75 per cent zinc, 5 per cent copper, 10 per cent tin and 10 per cent aluminum. All of the GE-265 motor axle bearings have been equipped with bearings of this composition. Results obtained have been far better than was expected.

It is stated that two men can manufacture twelve sets of these



Appearance and Construction of Three-Section Mold Used for Manufacture of Axle Bearings

bearings an hour and that the bearing maintenance expense has been reduced 75 per cent since their installation. All broken or worn-out bearings are cleaned thoroughly and remelted for the manufacture of new bearings, so that little or no waste is experienced.

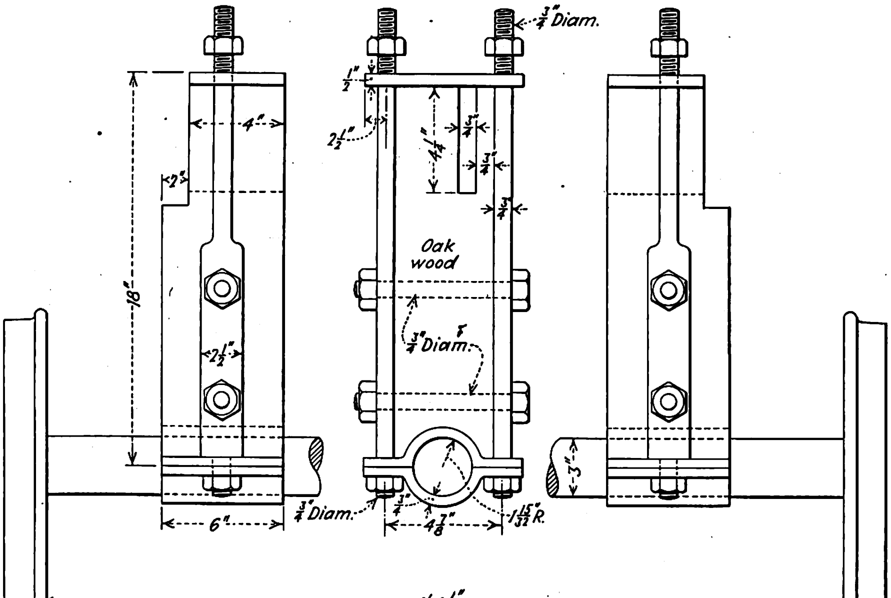
The results that have been obtained have been so encouraging that it is proposed to install these bearings on all motors in operation on the property.

> *Don't be a dead one, and have them "Say it with flowers,"*
> *Oil, inspect and overhaul your cars based on consumed power.*

Transporting Car Trucks with Broken Axles

SERVICE interruptions caused by broken axles have been reduced to a marked degree on the property of the Virginia Electric & Power Company, Richmond, Va., by the use of a dolly truck designed by the master mechanic, W. S. Hicks, and constructed in the shop. This truck consists of a pair of 11-in. flanged wheels with a 4-in. face, mounted on a 3-in. axle. Two pedestals are clamped to the axle and arranged for the support of the end of the truck frame. The body of the pedestal consists of an oak block about 17½ in. long, 6 in. wide and 4⅞ in. thick. The upper part of this block is notched to receive the steel angle frame of the truck and the lower end is fitted to the upper half of the axle clamp. A steel plate mounted on the top of the block provides a means for holding the truck frame angle rigidly in place. Two ¾-in. x 2½-in. flat bars, rounded on the ends and threaded, fasten the axle clamp to the axle and the truck angle frame to the pedestal. Two ¾-in. through bolts prevent splitting of the oak block and at the same time prevent shifting of the various parts. With the pedestal axle clamp fastened solidly to the dolly axle and the end truck frame angle set in the oak block slot and clamped down by the ½x4-in. plate a solid support for the truck is provided which permits skidding it to the place desired.

This equipment has afforded a means for rapid transportation of the car with the broken axle.

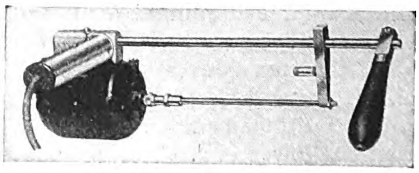


General Appearance of Assembled Dolly Truck. In Center, Appearance and General Dimensions of a Pedestal

New Equipment Available

Mica Undercutter Reduces Labor Costs

USE of a cutter of only $\frac{9}{32}$ in. diameter to facilitate ease in guiding and cutting commutator mica is a feature of a new electrically operated portable mica undercutter manufactured by the Hullhorst Micro Tool Company, Toledo, Ohio. This undercutter is sturdy and compact in construction and simple in operation. It can be operated at rapid speed by an unskilled man. An inexperienced workman can undercut mica to a depth of $\frac{1}{32}$ in. with this machine at a speed of 100 to 200 ft. per hour. The width of cut depends on the thickness of the cutter.



Portable Undercutter, Operating Handle and Other Details

The machine is driven by a Westinghouse motor and can be operated from any 110-volt lighting circuit by means of the attachment cord and plug. It is carried easily from one place to another by means of a case supplied with a leather handle.

Association News & Discussions

Central Traffic Meeting at Indianapolis

IN ACCORDANCE with the action taken at the last meeting of the Central Electric Traffic Association, the next regular meeting will be held at Lincoln Hotel, Indianapolis, Ind., on March 16 and 17, 1927, beginning at 9 a.m. Wednesday morning's session will be in the nature of a round-table discussion. Necessary committee work will be done the afternoon of March 16. The Thursday session will be devoted to reports of committees and such other business as may be properly presented.

Hotel reservations should be made with the Lincoln Hotel direct.

Southern Equipment Men Admit Manufacturers

MANUFACTURING companies or manufacturers' agents handling equipment or materials used by street railway operating companies may now be admitted as associate members of the Electric Railway Association of Equipment Men, Southern Properties. At the recent meeting of that association held in Memphis the by-laws were changed accordingly.

Dues for these associate members are fixed at not less than $10 per year, payable Jan. 1 for the ensuing year. Manufacturers or their agents wishing to become members should make application to the secretary of the association, A. Taurman, 2100 First Avenue, Birmingham, Ala.

American Association News

Rapid Transit

GENERAL discussion of rapid transit problems existing in the larger cities of the country took place at the meeting of the committee on rapid transit of the American Electric Railway Association held in New York on Feb. 25. An interesting point developed was that while rapid transit presents many peculiar problems individual to the local community, certain fundamental thinking should soon develop on principles. This should be set forth to guide cities facing the rapid transit situation in the coming few years. Managers of transportation companies in those American cities just below the fifth and sixth in size should have available fundamental data relative to types of systems, methods of financing and physical construction. These include relative advantages of two-track versus four-track tubes, minimum width of street to accommodate each and the economic conditions necessary for the various steps in the development of rapid transit business.

Members present were G. A. Richardson, chairman; D. L. Turner, Edward Dana, S. E. Emmons, R. E. Kerins representing J. S. Doyle, J. B. Stewart, Jr., Thomas Fitzgerald, E. J. McIlraith, R. F. Kelker, Jr., C. A. Burleson representing H. L. Andrews and H. E. Ehlers.

Special Rolling Stock Committee No. 2

DISCUSSION of essentials to be considered in the standardization of motor coach design and rules for inspection and maintenance of buses occupied the attention of special rolling stock committee No. 2, which met at association headquarters, New York, Feb. 7. Those present were V. W. Berry, chairman; H. C. Eddy, F. A. Klock, L. H. Palmer, T. L. Preble, A. J. Scaife and C. W. Stocks.

At the afternoon session G. H. Scragg, International Motor Company, who is also chairman of a committee formed to study and recommend uniform specifications for standard motor buses, was invited to describe the results which were being accomplished by his committee and work which they contemplated. He outlined a plan for a code of uniform requirements governing bus construction and explained that the work of his committee was sponsored by the N.A.C.C., which would print the final draft of the report. The report as at present outlined consists of five parts: (1) An introductory chapter giving general developments of the bus and looking forward to interstate regulation in 1928; (2) an analysis of the outstanding conflicts in the various state laws which have been analyzed to show how concessions can be made; (3) a discussion of every phase of regulation, both known and anticipated; (4) code of recommended practice to make possible the utilization or standardization of vehicles both as to size, weight and other requirements for the safety of passengers; (5) a complete index.

To avoid duplication of effort and save time, it was considered desirable to effect a close-working arrangement with Mr. Scragg's committee. This is to be done through Messrs. Stocks and Plimpton, each of whom is a member of one of these committees. Mr. Eddy, who is a member of the staff of the Board of Public Utilities Commissioners of New Jersey, explained how the standard motor bus specifications of that body were drawn up and told of the procedure used in reaching agreement. Mr. Eddy explained that there now are two sets of specifications being prepared, one to apply to buses of the city type, single deck, and the other to buses of parlor car design.

COMING MEETINGS
OF
Electric Railway and Allied Associations

March 8-10 — **Oklahoma Utilities Association, ninth annual convention, Huckins Hotel, Oklahoma City, Okla.**

March 16-17 — **Central Electric Traffic Association meeting, Lincoln Hotel, Indianapolis, Ind.**

March 17-18—**Illinois Electric Railway Association, seventh annual joint convention, Hotel Abraham Lincoln, Springfield, Ill.**

April 1—**American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

April 26-29—**Southwestern Public Service Association, convention, New Orleans, La.**

May 31—June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.**

With regard to the subject of inspection and maintenance standards, it was decided that questionnaires would be sent out asking for information as to methods that various companies are using. Members of the committee are also to communicate with companies in an effort to develop sufficient information on which to base recommended practices.

Public Service Section

UPWARD of 500 members attended a meeting of Public Service Company section A.E.R.A. on Feb. 18, at Newark, N. J. P. S. Young, vice-president of Public Service, and F. M. Rosseland, secretary-manager of the Newark Safety Council, spoke. Officers for the coming year were elected as follows: President, Philip F. Maguire; vice-president, Howard Briggs; secretary-treasurer, Joseph O'Driscoll; director for one year, William H. Shepherd; director for two years, James M. Symington; director for three years, George L. Walsh; director ex officio, Matthew R. Boylan.

There are now 395 members in the Public Service Company section, an increase of 77 since the gathering held last year in Jersey City.

The News of the Industry

New Franchise Draft in Omaha

A committee of 56, comprising leading business, professional men and labor leaders, has prepared a draft of a new franchise ordinance for the Omaha & Council Bluffs Street Railway, Omaha, Neb., that will be presented at once to the Council, with the request that it be voted on at the general city election on May 3. The franchise drawn by the company and submitted a year ago was voted down.

The new draft provides that the franchise shall run for 30 years instead of 40; that it may not be assigned to any out-state corporation or person; that the state royalty tax of $1,000 a year shall not be in lieu of occupation or similar taxes which may be assessed; that the Council may order extensions of lines, including bus service; that the company shall pay for paving, resurfacing and raising of track costs when ordered by the Council.

John L. Kennedy, a prominent citizen, who took the leading part in the negotiations, said that this step was necessary in order to save the railway system for the city. Action was vitally necessary this year as the company's $9,000,000 of bond indebtedness becomes due Jan. 1, 1928. Mr. Kennedy said that if the franchise election failed the city would be confronted with the danger of a receivership and a crippled system of transportation that might involve suspension of operation.

Discussion Put Over Until After Chicago Aldermanic Election

On Feb. 9 the committee on local transportation of the City Council of Chicago held its most recent meeting. At that time Alderman Joseph B. McDonough, chairman, complained of his inability to get all sides into a meeting at one time. It was suggested that three meetings be called on the theory that at one of those three meetings it might be possible to bring all the interested parties in.

A few of the Aldermen were frank enough to admit that they were not interested in traction matters or anything else just then, being in the midst of the aldermanic campaign. A motion to postpone all meetings until after Feb. 22, however, was defeated.

Bankers, traction officials and chairmen of the various bondholders' protective committees are prepared to tackle the situation, after the Aldermanic election. Now it appears that nothing is to be done until after the election on April 5.

Inquiry at the office of the transportation committee elicited the information that no meetings have been called and that none is contemplated until after that date. It is possible that some consideration will be given Mayor Dever's subway plan, but this does not involve any of the ordinances now before the committee.

Clarence E. Richard, writing in the *Journal of Commerce*, said:

> While the city hall seethes with pre-campaign turmoil and Aldermen are busy building their political fences and lining up their supporters for the mayoralty election in April as well as for the run-off between the high men, the traction problem has been lost sight of.
>
> Frequent attempts to get some one to discuss the question met with only puzzled looks—as if the city hall was unaware that settlement day is fast approaching, that the surface lines are now operating on a day-to-day grant that expires in a few months even if the maximum period is used up.

International Schedule Approved

The Public Service Commission on Feb. 24 revoked orders suspending schedules filed by the International Railway on Sept. 16, 1926, making increases in its rates for transportation in Lockport and on the Buffalo-Niagara Falls High-Speed Line and the Buffalo-Lockport-Olcott Divisions, and permitted the company to make the schedules, as filed, effective March 1 and to remain in effect for one year thereafter or until further order of the commission. The new fare in Lockport will be 8 cents. Six cents is now charged. The rate on the two other division will be increased from 2½ to 3 cents a mile.

Hearings were held by Commissioner Fooley in Buffalo and evidence was submitted covering operations in Lockport to Sept. 30, 1926. The commission's accountants allocated the fixed capital of the International Railway to the various communities served by it and also the revenues and expenses. The result of the commission's examination showed an operating deficit in Lockport of $37,640. The commission holds that the present 6-cent rate in Lockport is "insufficient to yield reasonable compensation for the service rendered and is unjust and unreasonable." The fixed book capital, as allocated to the city of Lockport, was $1,092,580.

The new mileage rate tariff applies to and from stations on the Buffalo-Niagara Falls High-Speed Line, also from Buffalo and Niagara Falls to Lockport via Division Street in North Tonawanda and to and from all stations between Buffalo and Olcott on the Buffalo-Lockport-Olcott Division, also from Buffalo and Lockport to Niagara Falls via Division Street.

The investigation by the commission brought the examination of the company's books down to Sept. 30, 1926, showing investment in road and equipment and operating results, segregated by localities. This investigation, based on book figures, disclosed an operating income of $113,488 for the year ended Sept. 30, 1926. The operating income of $113,488 provides a return of 1.61 per cent on the value of the road and equipment, $7,035,738, used in giving service on the two divisions.

Seven Cents in St. Louis—Grant Before Voters

The United Railways, St. Louis, Mo., on March 1 returned to the 7-cent fare as a result of the decision on Feb. 25 by a special court of three federal judges at Kansas City, Mo., which held that the company was not entitled to a continuation of the 8-cent fare or two tokens for 15 cents, a rate which went into effect temporarily on Feb. 7. The special court ruled that the federal court at Kansas City lacked jurisdiction so long as the railway's application for increased fare was pending before the Missouri Public Service Commission, inasmuch as the state body had not unduly delayed a decision. Under the terms of the court's ruling the railway is supposed to return to each patron the excess fare charged from Feb. 7 to March 1. The sum so to be returned is not believed to exceed $3,000 as receipts for extra fare were given to passengers only on request.

The United States District Court at Kansas City had previously issued a temporary restraining order against the Missouri Public Service Commission and other state officers to prevent interference with the charging of the higher rate of fare.

On Jan. 7 Receiver Wells had informed the commission that the company would put into effect the increased fare schedule in 30 days. The commission later suspended this schedule and it was then the company appealed to the federal courts.

The special court pointed out that the state commission had proceeded to examine into the fare situation as expeditiously as its machinery would permit and that the company should not have sought to override this process by filing its arbitrary schedule on Jan. 7. The three judges agreed that there was no evidence of dilatory tactics on the part of the commission.

The commission is expected to complete the audit of the company's books by March 10 and a decision in the application, which was filed June 7, is anticipated shortly after the commission audit is filed.

Mayor Victor J. Miller of St. Louis, Mo., will not officially present to the Board of Aldermen at this session of the board the measure to grant a blanket franchise to the St. Louis Public Service Company, which plans to purchase the properties of the United Railways at foreclosure sale in the near future. The Mayor has already made public the terms of the measure as tentatively drawn following numerous conferences with representatives of the company. It is the present plan of the Mayor to permit the company to propose the bill to the Board of Aldermen or to the voters by initiative petitions. He prefers a direct submission to the people. The company also wants the voters to pass on the measure.

The bill as drawn provides for a 30-year franchise if passed by the aldermen and a 50-year grant if the people approve. The company will operate on the service-at-cost plan under the bill. The time is now too short to get the proposition on the ballot at the municipal elections on April 5. The bill provides that should a special election be necessary the company must defray the cost of holding such election. This would amount to almost $50,000. The present session of the Board of Aldermen ends on April 11. A new president and fourteen of the 28 members of the board will be elected in April.

Open House in Williamsport—Carnations for the Ladies

During Saturday afternoon and evening, Jan. 22, the new carhouse and shops of the Williamsport Passenger Railway, Williamsport, Pa., were visited by more than 2,000 citizens of Williamsport. The company had invited the public to inspect its new quarters at West Third and Park Streets, and from 2 in the afternoon until 9 at night the place was thronged with visitors.

A number of very interesting and unusual features in the building were explained, and on exhibition were three new cars. On the new cars were signs describing them, and on the old car was a sign calling attention to its dilapidated condition and stating that after all the contemplated improvements were completed the company did not expect to operate cars of that character except in emergencies.

On the walls of the building were signs and charts and one large map showing the new trackwork that was done in 1926 and the cost of each item. Another sign described the "weekly pass," which the company was to put in use under the new fare plan, arranged to go into effect about March 1. Another sign had a large drawing of the metal tokens that will be sold two for 15 cents under the new fare plan and also contained two sample tokens, so that those visiting the exhibit could become familiar with them.

Music was furnished throughout the afternoon and evening by a ten-piece orchestra and coffee and doughnuts were served, the doughnuts being made in a motor-driven doughnut machine in full view of the visitors. Upon entering the building visitors were directed upstairs to the office portion, where women visitors were presented with carnations.

The lighting of the new carhouse was very brilliant and apparently every possible facility has been installed to make convenient the maintenance and repair of cars. Visitors to the building found that much attention had been paid to convenient arrangement and to easy supervision, as practically all partitions are of clear glass, so that operations in any department can be easily supervised.

Saturday evening at 6.30 L. W. Heath, the general manager of the company, gave a dinner at the Lycoming to the presidents and secretaries of the Rotary, Kiwanis, Lions and Exchange Clubs, Newberry Progressive Association, Merchants' Association, officials of Williamsport and South Williamsport, members of the traction investigation committee, bankers and representatives of the press, and at this dinner Mr. Heath gave a short talk, which he termed "A Report of Stewardship."

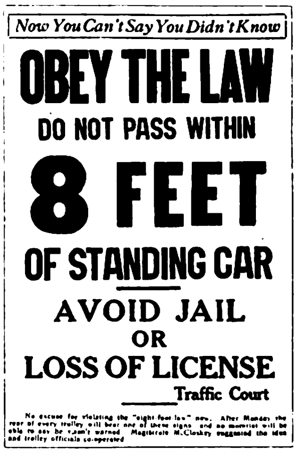
He briefly related the real progress to date, since the report of the railway investigation committee was made to the City Council a year ago, and stated that the railway situation in Williamsport and the method followed in improving it, providing better service and facilities, had been termed by railway men "The Williamsport Experiment," because, as far as was known, no other railway had ever applied to the city in the same co-operative way as had the local company, asking that it be investigated by a committee of business men, and that the result of what was being done is being watched with much interest in a number of other cities. Facts and figures were given to show that the railway to date was ahead of the program required of it by the committee's report, which was adopted by the city, and that the company had deferred for a year the increase in fare for the reason that it wished to show the people of Williamsport that it was going to do all that was required of it.

George Frey of the J. G. Brill Company said that the new cars built by his company for the local railway were probably the most elaborate cars they had ever made for city service.

After dinner was over, the party was taken on a tour of inspection to the new carhouse and shops.

"Eight-Foot Law" Reiterated in Brooklyn

Car cards bearing the direct warning from the traffic court against violation of the "8-ft. law" are being carried on both ends of the cars of the Brooklyn City Railroad and the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. This poster was developed at a conference with representatives of the traffic court, the Police Department and the transportation companies in Brooklyn. It was suggested by Magistrate Francis A. McCloskey of Homicide Court and indorsed by railroad officials.



Now You Can't Say You Didn't Know

OBEY THE LAW

DO NOT PASS WITHIN

8 FEET

OF STANDING CAR

AVOID JAIL
OR
LOSS OF LICENSE

_____Traffic Court

No excuse for violating the "eight-foot law" now. After Monday the rear of every trolley will bear one of these signs and no motorist will be able to say he wasn't warned. Magistrate McCloskey suggested the idea and trolley officials co-operated.

Warning Signs on Brooklyn Cars

In the same place usually occupied by theater advertisements, motorists following a trolley car see this court announcement, "Obey the Law. Do not pass within 8 ft. of standing car. Avoid jail or loss of license. Traffic Court." Police officials concurred in the idea and promised to conduct a campaign of enforcement. It was said that railways in Manhattan would likely adopt the idea, which took tangible form in Brooklyn on Feb. 21.

Engineers Go Ahead with Plans for Chicago Subway

Completion of engineering plans, costs and specifications for a downtown subway in Chicago awaits only advice from the City Council, according to a recent announcement by R. F. Kelker, Jr., engineer for the local transportation committee of the City Council.

Upon instruction received from the City Council, Mr. Kelker, in company with other city engineers, has been constantly at work for the last ten weeks on a field survey of the plan recommended last August by the citizens' advisory subway commission for the construction of two subway routes under the Loop district; one a rapid transit tube under State Street between Chicago Avenue and Roosevelt Road and the other a low-level loop subway for street cars only under Washington, Michigan and Jackson Boulevards. Having recently completed this survey, upon which it is hoped the City Council will presently frame an ordinance, the engineers are now working on general specifications for any subway plan that may be adopted, especially the difficult rearrangement of sewers and public utility conduits which subway construction would make imperative.

Major Kelker is also studying the possibility of creating a mid-city elevated trunk line in the neighborhood of Ashland Avenue, connecting the Ravenswood and Englewood branches of the Chicago Rapid Transit system and assuring residents of the west side of the city direct north and south transportation without making it necessary to take a circuitous trip through the Loop district.

Mayor William E. Dever strongly advocates immediate construction of subways. He has indicated in recent speeches in his campaign for re-election that he will do all in his power to have a subway ordinance submitted to the voters at the judicial election next June.

New York's Mayor Urges More Money for Subways

Doubt appeared to have been removed on March 3 that the Legislature of New York would pass the resolution to submit the proposed constitutional amendment empowering New York City to borrow $300,000,000 outside its debt limit to build new subways. Mayor Walker urged the passage of the resolution at the hearing the previous day, but he was no more specific than he has been in the past, merely repeating the 5-cent fare and other political shibboleths handed down from Hylan, the former Mayor.

Late on March 3 a movement developed to delay the submission of the amendment to the voters until 1928, which will be a Presidential election year. This was started by Senator John Knight, Republican leader of the upper house, who asked Attorney-General Albert Ottinger whether it would be legal to provide for the submission next year instead of at the November election this year.

The Attorney-General gave an informal opinion that the Legislature had the legal power to delay submission, the State Constitution providing that a proposed amendment might be submitted in the time and manner that the Legislature might direct.

Attack on Minneapolis Regulatory Act

Should the Brooks-Coleman street railway regulatory act be repealed at the present Minnesota Legislature chaos would result. This was the opinion expressed by Charles B. Fowler, counsel for the Minneapolis Street Railway; Pierce Butler, Jr., counsel for the St. Paul City Railway, and Oscar Mitchell of the Duluth Street Railway, at a hearing before the Senate committee on legislation recently at the Capitol. Proponents of the repeal had their inning a week previously.

The Brooks-Coleman act was passed in 1921. Since then the electric railways of the state have been regulated by the Minnesota Railroad and Warehouse Commission as to issues of stocks and bonds and as to rates of fare.

At the previous meeting a special committee of the Minneapolis Civic and Commerce Association presented the following opposing resolution:

> Minneapolis car service is second to none in the United States.
>
> The act was passed after careful consideration by legislators, and citizens and civic organizations.
>
> Before enactment the electric railway situation was constantly injected into politics.
>
> Expense of reaching valuation figures to fix fares would be wasted by repeal.
>
> Fare fixing should be left to disinterested arbitrators.
>
> Since passage of the law differences between the Minneapolis City Council and the railway have been largely composed.
>
> Repeal would lose all that has been gained by such harmony and improvement of service.
>
> Chaos would prevail in the legal status of city and company by repeal.

.The three railway attorneys said that repeal would not reinstate the old franchise even if they had not expired as in the case of Minneapolis in 1923. The attorneys for St. Paul and Duluth took the opposite view. Mr. Fowler said the Brooks-Coleman act extends local control over railways. The main object is to provide a workable, practical and equitable method for having a rate of fare determined from time to time as conditions change. The Council represents its constituents and cannot do otherwise. In the very nature of things it must be biased in favor of the citizens. He said further:

> To such an extent has this view been adopted that there are 39 states which have public utilities commissions to which much more extensive powers are granted with reference to the regulation and control of utilities within cities than is given by the Brooks-Coleman act.

In case of repeal the company would try to get the highest rate it could. The battle would be on with the city over fares, extensions, improvements, etc. The situation would be worse than in 1921.

The St. Paul City Railway counsel held that repeal would make it impossible to refund $10,000,000 bonds in 1928 and the result would be receivership. The Duluth Railway counsel said a $3,000,000 bond issue to be refunded in 1930 would be in danger of finding no market.

Editorials were quoted from Twin Cities and Duluth newspapers opposing the repeal.

A decision is expected soon by the general legislation committee of the Senate.

"Turn Backward, Oh, Time——"

WHILE in New York Mr. Lowry inspected the new invention of Van Depoele & Sprague, which is a horseless car. Motors are built into the floor of the car and by wire are connected with an overhead current which propels the car along a steel track without horses being necessary. Mr. Lowry said:

"The car isn't practical yet, but if the inventors ever do get it where it is usable, you can rest assured the system will be adopted for Minneapolis."

The above statement is part of a clipping taken from the Minneapolis *Journal* of Feb. 23, 1887, and included in a special edition of the *Journal* distributed at the fortieth anniversary of the Minneapolis Real Estate Board on Feb. 23 at the Hotel Radisson.

N. B.—Mr. Lowry has ceased to expand the horse lines, but each year renews his faith in the electric lines.

Free Parking Space at North Shore Stations

Free parking space at stations for the automobiles of customers is the latest feature of service on the Chicago, North Shore & Milwaukee Railroad. This extra bit of service, started in connection with the railroad's Better Business Campaign, is expected to increase passenger traffic materially. On the Shore Line route parking space is provided at the Milwaukee, Racine, Kenosha and Ravinia stations. On the Skokie Valley route eleven stations provide this service. A special booklet, containing information about this latest innovation of North Shore Line service, has been prepared and is being distributed by station agents.

Completion of First Hole of Moffat Tunnel

President Coolidge, by remote control, set off the blast which broke down the last barrier between the two bores of the preliminary work of the Moffat tunnel on Friday night, Feb. 18, at 8.10 o'clock mountain standard time. Elaborate ceremonies in honor of the event were staged in Denver, conducted by Governor Adams of Colorado and broadcast from radio station KOA of the General Electric Company in that city.

The Moffat tunnel, boring under the Continental Divide, will be 6.04 miles long, the second longest tunnel in the World. It will be 3 miles shorter than that of St. Gothard under the Alps. Its completion will mark the culmination of a heroic struggle for the construction of a transcontinental route through Colorado, running from Denver to Salt Lake City. It will open the western slope of the Rocky Mountains to all-year traffic, connecting in the west with Moffat's original railroad below the snow blockage line.

With the utilization of the proposed Dotsero cut-off, a 41-mile branch railroad to be built from the west portal of the tunnel, the distance from Glenwood Springs, on the west slope, to Denver, will be reduced from 343 to 173 miles. The railroad in the tunnel will be electrified, electric locomotives hauling the trains. The steam locomotives will have their fires banked and will be hauled through with the trains. Tunnel construction work was started in October, 1923.

Wide World Photos

Governor Adams of Colorado Congratulates Mayor C. C. Nelson of Salt Lake City (Left) After Final Blast in Moffat Tunnel

Extracts of Governors' Messages Continued

A digest of the Governors' addresses to the Legislatures was started in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 26. Five more messages are now added. They are from the states of Rhode Island, Tennessee, Washington, Connecticut and Wisconsin.

RHODE ISLAND

Aram J. Pothier, Governor, stated in his message to the Legislature that of late years there had been an increasing tendency on the part of the state to control the matter of the issuance of the bonds and stock of public utility corporations from the outset by giving to the regulating commission the power to pass upon the issue of securities of such corporations and to scrutinize the arrangement under which these are paid for. The results to be expected from it are, in the end, a great simplification of the problem of regulation, as under it the outstanding securities will gradually come to be, at least *prima facie*, the measure of the real investment devoted to the public service upon which it may ultimately be conceded a proper return is due. The purchaser of such securities would be assured that proper application was made of the funds derived from the issuance and public confidence would be created in the integrity of such securities.

The exercise of such authority by the Public Utilities Commission would make necessary the employment of expert engineers and accountants in order that its duties might be properly performed. Inasmuch as such regulation would largely inure to the benefit of the utility and the holders of its securities, it would appear proper that any such extraordinary expenses involved in reference to a particular issuance of securities be charged to the particular utility concerned. He therefore recommended to the General Assembly the passage of suitable legislation vesting in the Public Utilities Commission the power to regulate all issues of bonds and stocks of all public utility corporations in the state.

He recommended an increase in the gasoline tax from 1 cent to 2 cents per gallon, to go into effect on July 1, 1928. The Motor Vehicle Department, during the past year, has made an earnest effort to reduce the terrible toll of highway accidents.

TENNESSEE

It is the plan of Gov. Austin Peay to continue during the next two years to build state highways. He opposed any increase in the gasoline tax, believing that 3 cents a gallon was enough tax to pay on gasoline. Further, because his state could build and complete its state system of highways on the present tax, it was generally a fine thing to maintain a lower tax. He referred to the report of the Commissioner of Highways and Public Works, which contained suggestions for the regulation of travel and traffic on the state highways. Parking automobiles on the traveled portions of these roads was causing many accidents resulting in loss of life and property.

On the subject of buses, he said that regulation had become necessary to safeguard the security and comfort of the public; that exclusive franchises to operate these bus lines would be sought. Such franchises, if granted, would be exceedingly valuable and could be sold for large sums. He believed that the state had a right to part of the receipts from all bus lines. He recommended that a commission be created and invested with proper authority to regulate schedules, fares and service on all buses and bus lines and such form of transportation, and to receive and collect a right percentage of all the receipts accruing from such use of the roads by these buses and bus lines, or in lieu thereof that an annual tax be levied and collected in keeping with the value of the franchises and rights that they are using, whether or not they be exclusive.

He recommended proper legislation on the distribution and price of gasoline. On the question of public utilities, he recommended the abolition of the Board of Public Utilities, which he claimed never functioned to the satisfaction of the people. He reiterated his thoughts on the subject which were expressed in opening the campaign for Governor a year ago.

He recommended the passage of a bill to simplify corporation laws so as to encourage the investment of foreign capital in the state, and to save the loss of fees and revenues which the state is now losing through the use of foreign charters to corporations whose business was largely domestic.

WASHINGTON

Gov. Rolland H. Hartley reminded the state Legislature that he had previously expressed belief that the state was spending too much money for highways and had requested the reduction of motor vehicle license fees. He said he was still of the opinion that a smaller construction program could be carried on with better supervision, less cost and more satisfactory results to the general public.

CONNECTICUT

In Connecticut the problems of motor vehicle regulation become each year more numerous and pressing. Governor Trumbull, in his message to the General Assembly, urged upon the Legislature the creation of a joint standing committee on motor vehicles which should have exclusive charge of the consideration of all proposed legislation dealing with these topics. He said that it must be recognized that transportation problems and regulations of the various forms of vehicular traffic are becoming each year more vital to the economic stability of the industries and specific conditions of the inhabitants of the state.

WISCONSIN

Gov. Fred R. Zimmerman, in his message to the Wisconsin Legislature, has approved the segregation of the motor vehicle department, placed under a commissioner to be appointed by the Governor. He recommended that the property tax on all motor vehicles should be removed and an increased tax on gasoline should be substituted.

Free Rides in Spokane

Two business institutions of Spokane, Wash., have announced the policy of free car rides. For the second time in six months, Culbertson's, a department store, chartered all inbound cars of the Spokane United Railways for its semi-annual assistant buyers' sale, paying the company direct for all passengers carried between 9 and 10 a.m. on the day of the sale. Thousands of shoppers took advantage of the offer.

The second institution was the Clemmer Theater, which has announced it will pay the fare of any patron at its theater who presents a transfer at the ticket office dated the day it was taken to the theater and presented between 11 a.m. the opening hour, and 1. p.m.

Trolley Topics, published by the Spokane United Railways, says that the department store and other houses realize how necessary it is to have reliable and responsible transportation always at hand.

Old Richmond Franchise Relinquished

The Virginia Electric & Power Company, Richmond, Va., has formally surrendered all its old franchises and certified the agreement as to the surrender of its three toll viaducts within five years at the option of the city. The deeds of surrender were handed to City Clerk Alfred H. McDowell, who gave an official receipt for them. The form and style of execution of the documents were approved by the city attorney. When the city approved the so-called blanket traction franchise ordinance on Aug. 19, 1926, it was agreed that within six months the company would surrender the franchises whose privileges were included in the blanket agreement. The old franchises, all of which were operative until the blanket franchise was drawn to replace them, were acquired by the Richmond Passenger & Power Company, the Virginia Railway & Power Company and the Virginia Electric & Power Company as the local railway system in the city of Richmond developed.

Missouri Line Receives Franchise

A franchise for the construction and operation of an electric passenger and freight line with its Clay County terminus in Liberty, Mo., and its Jackson County terminus in Kansas City, Mo., has been recently granted by the Clay County Circuit Court. The right of way is said to be under option. This project was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 26, page 393.

Articles of association have been granted by the Secretary of State to W. E. Winner and eleven business men and land owners of Liberty and its vicinity. Construction plans, according to Mr. Winner, call for a 150-ft. right-of-way in Clay County. The men associated with the project are planning a double track.

The road will run northeast to the Missouri River from the point contemplated, crossing on its own bridge at a point approximately 3 miles south of Birmingham and a trifle to the west. Following the river east a short distance, the line would then branch off northeastward, passing just east of Birmingham. At a point approximately 3 miles from Liberty the plan contemplates a branch line east to the Atwood quarries.

$314,000 Expenditure at Macon Suggested

Virtual rebuilding of the entire railway system of Macon, Ga., at an outlay of $314,000 is proposed in an exhaustive survey made by F. L. Butler, copies of which have been received by Mayor Wallace Miller and members of Council of Macon. Mr. Butler is vice-president of the Georgia Railway & Power Company, which is included in the system of the Georgia Power Company, which also controls the Macon property.

In return for this expenditure, a very large one for a city of the size of Macon, the company wants the gross receipt tax of 2 per cent imposed by the city lifted, the pavement assessment levy imposed by the city lifted, and a cash fare of 10 cents with three metal tokens for 25 cents.

In addition to the main points set forth above a multitude of minor changes are proposed and the public utilities committee of Council awaits a report from the city electrical engineer, Charles H. Humphreys, before giving the proposal consideration. At least several weeks must elapse before the city will be ready to take up the matter with the company for discussion.

Bill Against Indiana Commission Killed

The Indiana Senate has killed the Cann bill, providing for the abolishment of the Indiana Public Service Commission. The vote was 30 to 17. Seventeen Senators entered the debate. Howard A. Cann, who introduced the measure, declared that the state administration defeated the bill. Many of the Senators who voted against the bill said in their arguments that any opposition to the present personnel of the commission or to its decisions was not a reason for abolishing the regulatory form of adjusting public utility relations with civic government.

Amendments to the Moorhead public utility bill in the Indiana Senate have been made as follows:

> To bring holding companies, whether inside or outside the state, under the jurisdiction of the Public Service Commission.
>
> To fix the value of utility property in all proceedings other than for rate-making purposes "as a going concern at the actual present fair value thereof," the idea being to exclude good will and other matters as part of the valuation.
>
> To require utilities to exhaust every avenue of appeal through the state courts before taking an appeal from a decision of the commission to the federal court.
>
> To make the commission on law conform with the Interstate Commerce Commission act as regards suspension of rates and reparations.
>
> To provide for the appointment of members of the commission by the Governor. Members of the commission would be removable for cause by the Governor, or on verified petition filed by any taxpayer in the Circuit Court at Indianapolis, with right of appeal from that court to the State Supreme Court as in civil cases.

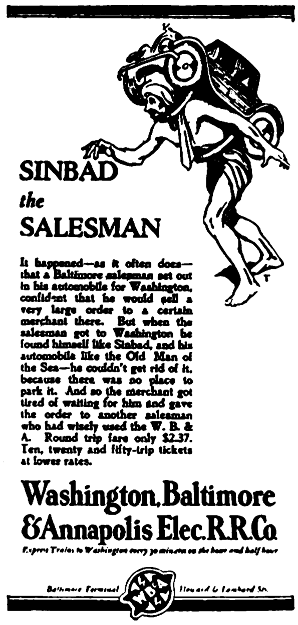
Developments in Los Angeles Fare Problems

In a message to the City Council on the railway situation Mayor George E. Cryer, Los Angeles, Cal., recommends the suggestion of the Municipal League that Delos F. Wilcox, traction expert, be brought to the city to advise on the railway problem now at the front with the application of the Los Angeles Railway for an increase in fares from 5 to 7 cents. The Mayor believes that Mr. Wilcox should be able to "assist us in the pending rate case," as well as to report upon other phases of the railway situation.

Meanwhile the application of the Pacific Electric Railway for fare increases on its urban and interurban lines operating in southern California is scheduled for hearing before the California Railroad Commission on March 10. The city of Los Angeles has already appropriated funds to oppose the rate raise.

Sinbad the Salesman in Bad

He couldn't get rid of it because there was no place to park and so the merchant got tired waiting for him and gave the order to another salesman. The latter was a wiser salesman because he had traveled from Baltimore to Washington on the Washington, Baltimore & Annapolis Electric Railroad. For him the round-trip fare was only $2.37, while the round-trip fare for the other salesman was too costly to be computed. The inability of Sinbad to rid himself of his burden, namely his automobile, is illustrated effectively in *Printers' Ink* of Feb. 3, 1927. In newspaper advertising the Washington, Baltimore & Annapolis Electric Railroad is meeting the problem presented by the motorized sales force.



SINBAD
the
SALESMAN

It happened—as it often does—that a Baltimore salesman set out in his automobile for Washington, confident that he would sell a very large order to a certain merchant there. But when the salesman got to Washington he found himself like Sinbad, and his automobile like the Old Man of the Sea—he couldn't get rid of it, because there was no place to park it. And so the merchant got tired of waiting for him and gave the order to another salesman who had wisely used the W. B. & A. Round trip fare only $2.37. Ten, twenty and fifty-trip tickets at lower rates.

Washington, Baltimore & Annapolis Elec. R.R. Co

Express Trains to Washington every 30 minutes on the hour and half hour

Baltimore Terminal Howard & Lombard Sts.

CONSPICUOUS EFFORT TO SELL SERVICE

The accompanying reproduction shows another conspicuous effort in the electric railways' campaign to urge the use of the electric line for transportation to the office, for shopping and to insure prompt attendance at the theater.

News Notes

Paving Question on Grand Rapids Ballot.—The City Commission at Grand Rapids, Mich., has approved by unanimous vote the plan to place on the ballot at the primary election on March 7 the charter change which will allow the commission to eliminate the charge now assessed against the Grand Rapids Railway for paving between tracks.

Fares in Annexed Region Reduced.—The Lynchburg Traction & Light Company, Lynchburg, Va., has reduced car fares in the annexed territory to 5 cents. The company has charged 6 cents since March, 1922, and since annexation sought to prevent the city from cutting the extra cent out. This was done by application to the federal courts for an injunction, but the District Court and Circuit Court of Appeals held they had no jurisdiction.

P. R. T. Released from Air Mail Contract.—Cancellation of the air mail contract for the route between Philadelphia and Norfolk via Washington is announced by the Post Office Department, the Philadelphia Rapid Transit Air Service, the contractor, having requested a release. The service was operated primarily as a passenger carrying line during the Sesquicentennial Exposition and had been suspended for the winter.

Wage Conferences in Augusta.—Negotiations are in progress between the management and employees of the Augusta Railway & Electric Corporation, Augusta, Ga. It is said that though both parties are agreed upon the main questions at issue, the company is unwilling to accede to certain demands involving money concessions upon the alleged plea of financial inability to meet added obligations under present conditions. Under the existing contract failure to reach an amicable agreement calls for arbitration.

Route Numbers for New Jersey Cars.—Trolley cars of the Public Service Railway, Newark, N. J., operating in the Essex Division are to carry route numbers, in addition to other signs indicating destination. The Central line cars already have been so equipped, and other lines will follow. Public Service bus lines have carried route numbers for some time, routes being designated by even numbers. Trolleys will have odd numbers, and the bus and electric railway lines operating in the same territory will have, so far as possible, contiguous numbers.

Rehearing on Permit Transfer Denied.—The Public Service Commission on Feb. 17 denied the petition of the Schenectady Railway for a rehearing on the commission's order, dated Oct. 6 last, consenting to the transfer of the certificate for the operation of a bus line between Schenectady and Guilderland, N. Y., from John Coons to Bohl Brothers, on the ground that sufficient reason had not been advanced by the railway for a further hearing. Bohl Brothers Inc., operating under another certificate covering a line between

Albany and Altamont, commenced through travel between Albany and Schenectady after the certificate covering the Guilderland-Schenectady line had been transferred to them. Following this action by the commission, the Schenectady Railway alleged that Bohl Brothers were operating between Albany and Schenectady by way of Guilderland in competition with it.

Expect Increased Revenues Since "Ride a Day" Urged.—"A Ride a Day Will Make Them Pay" was the slogan of the Ride the Street Cars Week in Seattle, Wash., which extended from Feb. 20 to 27 and which was sponsored by the Seattle Municipal Street Railway. Practically every civic club in the city co-operated in an effort to help lift the burden of debt from the lines. The Owl Drug Company gave away car tokens to all customers with purchases of 50 cents or more. All of the daily newspapers, in editorials and front-page stories, extended aid in advertising the plan.

Higher Fare in Johnson City. — A 7-cent fare for Johnson City, Tenn., was announced recently by D. R. Shearer, vice-president and general manager of the Johnson City Traction Company, following approval of the new rate by the State Railroad and Public Utilities Commission. An appeal for aid was prompted by the continued decrease in traffic, the deterioration of the cars and need for repairs to the tracks. Mr. Shearer said that at the present time the indebtedness was about $30,000. If the people would co-operate, he said he would put a plan in effect calling for a ten-minute schedule throughout the system and eventually would install buses to points of the city which are not now reached by the street cars. Any added income is to be diverted to improving the physical property.

Improvement Classes in Salt Lake City. — The Utah Light & Traction Company, Salt Lake City, Utah, has started night classes for supervisors, carhouse foremen and employees in general, by means of which they will be enabled to increase their knowledge of several subjects, including mathematics, mechanical drawing, English and spelling. Two nights each week are devoted to these classes. No charge is made. A large number has enrolled.

Higher Fare Approved. — The Citizens Railway, Clarksville, Tenn., has been authorized by the Tennessee Railroad and Public Utilities Commission to increase its cash fare by 2 cents. The new fare will be 7 cents with a 6-cent book rate and 3 cents for children. The old fare provided a 2½-cent fare for children. The railway system, with a trackage of only 3½ miles and at present operating only three cars is a semi-civic project, the stock being owned by citizens who fifteen years ago bought the system when operation was about to be discontinued by the private owners.

Express Service Discontinued.—The Jacksonville Traction Company, Jacksonville, Fla., has served notice of the discontinuance of its express service on the Brentwood line. The operation of the express cars has been carried on for the past two months as an experiment.

Recent Bus Developments

Bus Proposal Rejected

For Second Time Cincinnati Residents Vote Down Proposal to Replace Railway with Coaches

Two hundred and fifty citizens of Mount Lookout, a residential section of Cincinnati, Ohio, voted on Feb. 11 to refuse the offer of a four months trial of motor coach service to replace electric railway service. The proposal was made by Walter A. Draper, president of the Cincinnati Street Railway, after careful study of the transportation problem of that district and after many conferences with the special transportation committee of the Mount Lookout Business Men's Club.

The Cincinnati Street Railway is confronted with the necessity of reconstructing its tracks within a year or two on Delta Avenue, the route that serves Mount Lookout. Much had been said in conferences with the transportation committee about the feasibility of motor coach transportation, and it appeared that motor coach service might be more desirable to these people. The $175,000 necessary for new tracks would then be practically a loss. Work on the new tracks could not be started at once and the old tracks were already in rather poor condition.

It was proposed with the motor coach service to give a through line to the main business district of Cincinnati in both directions, whereas the railway furnishes through service only to the north. A transfer to Eastern Avenue at Delta is necessary if one wishes to go downtown, south on Delta. The rate of fare would remain the same as regular motor coach fare in Cincinnati.

In presenting the proposal to the people Mr. Draper said in part:

> In considering the suggestion I am especially desirous that it be understood that it is being made without any other motive than as outlined herein, and that is to give the people of Mount Lookout on Delta Avenue an opportunity to determine for themselves and by experience whether they prefer or can better be served by motor coaches or cars. Without trying motor coaches exclusively they cannot have the actual experience to be used as a basis for comparison. If they can best be served by motor coaches and prefer them after a trial, and if motor coaches are able to take the place of street cars in some communities, such as Mount Lookout, it would seem to me that it is desirable to find this out before expending the money and putting the new tracks in the street.
>
> It should be clearly understood that the matter is to be left to the people and that the temporary discontinuance of street cars should in every way be safeguarded so as to require the restoration of street cars in case your people should so desire.
>
> In conclusion I desire to say that this matter has been discussed with Edgar Dow Gilman, the Director of the Department of Public Utilities, and it is now being submitted to you with the approval of that department, the understanding being that the temporary operations proposed to be undertaken as a trial will be approved by the city if your people express themselves as desiring it to be done.

The real wishes of the people were expressed in the following motion:

> It is the sense of this meeting that we do not favor a substitution of motor coaches for street cars on Delta Avenue, even for a trial, but desire the street car service to be continued.

This is the second time the Cincinnati Street Railway has had a proposal to substitute motor coaches for railway service rejected in a thickly populated section. The other case was similar to this, except that the street paving was being renewed and the tracks were torn out. In that instance the company offered to substitute motor coach service for railway at once, or to have the center of the street left open and the sides paved while a trial of motor coach service took place. Both phases of the offer were rejected by the people in that district.

Connecticut Commission Reversed in Bus Case

Judge Newell Jennings of the Superior Court, sitting at Hartford, Conn., recently rendered a decision setting aside and declaring void an order of the Public Utilities Commission which granted to the New England Transportation Company a certificate to operate a bus line between Waterbury and Hartford via Milldale, Southington, Farmington and West Hartford.

In its original application the New England Transportation Company, which is a subsidiary of the New York, New Haven & Hartford Railroad, requested the Public Utilities Commission for a certificate to operate a bus between Danbury and Hartford via Waterbury. This it did despite the fact that the Waterbury & Milldale Tramway operates an electric railway between Waterbury and Milldale, a third of the distance between Waterbury and Hartford, and operates a bus line in conjunction with its railway between Waterbury and Milldale for some period of time. It applied to the commission for an extension of its bus certificate from Milldale to Hartford via Southington, Plainville, Farmington and West Hartford. The railway produced evidence to show that public convenience and necessity demanded the operation of a bus over the route which was proposed by it.

After the evidence had been closed, the Transportation company amended its route so that it paralleled that of the tramway. Notwithstanding the fact that the tramway had produced the evidence, the commission passed an order granting the certificate to the Transportation company. From this order the tramway appealed to the Superior Court and was successful when Judge Jennings recently decided that the commission erred in granting the certificate.

The decision in this case is of particular interest because a ruling of the commission has not been reversed by the Superior Court for some time. The appeal of the tramway acts as a stay, so that the Transportation company has been unable to operate between the terminals of the route.

The Transportation company has now appealed to the Supreme Court of Errors of Connecticut.

Worcester Consolidated Company Buys Lake Bus Lines

The Worcester Consolidated Street Railway, Worcester, Mass., has bought the Lake Bus Lines. Included in the transaction are seven buses, a large leased garage with a repair shop and the good will of the Lake Bus Lines, Inc. It is the first strictly "city" bus line bought by the railway and in a measure supplements the only other local bus lines operated by it.

When the Massachusetts Omnibus Company of Boston sent a fleet of eighteen buses to Worcester Mr. Carter, from whom the Worcester Consolidated Street Railway bought the Lake line, was in the trucking business. The bus company was forced out of business. Mr. Carter bought four of the buses for $1,600. He used them for a time to carry private parties, but finally established the Lake lines at the urgent plea of Lake district residents in Worcester. The Consolidated, in addition to its local routes, now operates buses to Marlboro, Clinton, Oakdale and Southbridge.

Bus Capacity Tax in Dallas Questioned

A test of a city's right in Texas to levy and collect from street car systems operating buses for carrying passengers the same per passenger capacity tax levied on other buses used as common carriers is to be made in Dallas, Tex. A temporary injunction was granted recently restraining John H. Cullum, county tax collector, from levying and collecting the $4 per passenger capacity tax, in addition to the regular registration fee, on seven of 21 buses operated by the Dallas Railway & Terminal Company. This company operates the railway lines in Dallas and runs 21 passenger buses as feeders. The petition of the railway sets forth that Tax Collector Cullum was tendered the regular registration fee for these trucks operated as passenger-carrying buses, but that he refused to accept such fee without the additional $4 per passenger capacity fee. The plaintiff also is asking that a writ of mandamus be issued directing Mr. Cullum to accept the registration fee and issue a license for authority to operate during 1927.

Holyoke Litigation Ends

The Holyoke Street Railway, Holyoke, Mass., has won a final and decisive victory over the appeal of the Interstate Buses Corporation, Hartford, Conn., for a rehearing of the case. The latter company has received notification from the United States Supreme Court that petition for a revival of the case has been finally denied. The final denial of the courts to hear an appeal will prevent the Interstate Buses Corporation from taking passengers between Springfield and Greenfield without the necessary licenses, which the company has been unable to secure.

The lines of the Holyoke Street Railway and Interstate Buses Corporation run parallel for a great distance between Springfield and Greenfield, Mass. The former company alleged illegal competition and sought to prevent the bus company from picking up passengers over any of this distance without first procuring licenses from the towns passed through.

The railway alleged that the bus company was acting in violation of a Massachusetts statute, while the Interstate company said the statute was unconstitutional. The trial a year ago was based on this argument and the result upheld the state of Massachusetts and its bus laws. The Interstate in its fight attempted to have an injunction issued to prevent officials from prosecuting bus drivers of the company. It succeeded in securing a temporary injunction in the state courts. Three judges of the United States District Court later ordered the bill dismissed. On an appeal the Supreme Court upheld the District Court.

Petition on Framingham Bus Substitution Heard

The petition of Franklin T. Miller, receiver of the Boston & Worcester Street Railway, Framingham, Mass., in which he seeks to gain permission to supplant bus service for electric railway service over parts of the lines, was heard recently before Judge Carroll of the Supreme Court.

Roland W. Boyden, representing the bondholders, said that any discontinuance of electric railway service would injure the good will at a sale of the property if a reorganization is effected. Mr. Boyden brought out that plans for reorganization were temporarily held up awaiting the action of the Public Utilities Commission regarding the valuation of property. Just recently the commission decided that the property had a valuation of $2,900,000. There is a bond issue of $2,500,000.

Mr. Boyden's request for a postponement for a month to permit plans to be made for a reorganization was granted.

New Line Authorized.—The Public Service Commission granted on Jan. 18 the petition of the Utica Railway Coordinated Bus Lines, Inc., for a certificate for the operation of another bus line within the city of Utica, N. Y. The line is about 3 miles long.

Certificate Granted.—The Public Service Commission on Feb. 25 granted the petition of the Rochester Railways Co-ordinated Bus Lines, Inc., for a certificate for the operation of bus lines from the city of Rochester to Manitou Beach, Grandview Beach, Island Cottage and West Greece, N. Y.

Bus Line Approved.—The Public Service Commission granted the petition of the Olean, Bradford & Salamanca Bus Line, Inc., for permission to operate a bus line between Olean and Salamanca and between Olean and the New York and Pennsylvania state line on the road to Bradford, Pa. This company is a subsidiary of the Olean, Bradford & Salamanca Railway, which is now in receivership, and which desires to replace cars with buses.

Bus Petition Granted.—The Public Service Commission on Feb. 25 approved the petition of the County Transportation Company, Inc., for a certificate calling for the operation of bus lines in Port Chester and Rye. Trolley service has heretofore been given in this territory by the New York & Stamford Railway, which discontinued its lines in December, 1926. The bus company is a subsidiary of the railway. The routes authorized by the commission are more extensive than the electric railway lines.

Abandonment of Unprofitable Service Favored.—A resolution was adopted recently favoring the proposal of the Wisconsin Public Service Corporation to abandon its unprofitable railway service in Two Rivers, Wis., and interurban service between Manitowoc and Two Rivers. The discontinuance was favored on condition that adequate bus service be installed under some plan agreeable to both cities.

Allowed to Run Bus Line.—The Public Utilities Commission has granted permission to the Connecticut Company to operate a bus line between Newington Junction and Hartford via West Hartford, Quaker Lane and Capitol Avenue. The company is planning to start operations over the new line about April 1. The service to be maintained will be decided upon after a trial period. The rate of fare between Newington and Hartford will be 20 cents or two tokens with the privilege of transfer. At the start an hourly headway will be arranged. It is planned to add a bus during the rush periods as the business grows.

Rush-Hour Service in Effect.—The bus service installed on Washington's Birthday by the Twin City Motor Bus Company to supplement railway service into Bryn Mawr of the Minneapolis Street Railway, under a recent permit of the Minneapolis, Minn., Park Board and the State Railroad and Warehouse Commission, operates only in rush hours. The service is every twelve minutes between 7 and 9:30 a.m. and 3:18 and 8 p.m. It is accommodating workers and school children in a newly settled community beyond Bryn Mawr and the center of Minneapolis. The settlement is not sufficient to warrant continuous service. The bus line is the first operated by the Twin City Motor Bus Company over parkways in Minneapolis and the fourth opened for the railway within the city limits since last fall. The regular fare prevails with transfer privileges.

Substitution by Bus Approved.—The Public Service Commission on Feb. 25 granted the petition of the Westchester Street Transportation Company, Inc., for authority to substitute bus service for street cars on a portion of its route in Scarsdale, N. Y., and authorized the putting into effect of its tariff of rates on one day's notice. This company is a subsidiary of the Third Avenue Railway. On Dec. 9, 1926, the commission authorized the substitution of buses for street cars in White Plains with the approval of the city authorities. On Jan. 26, 1927, the village of Scarsdale approved the substitution of buses for street cars, which the commission approves in this order. The company proposes to operate its lines in White Plains and Scarsdale in one continuous route. The rate of fare authorized within the city of White Plains or in the village of Scarsdale is 10 cents and from Scarsdale to White Plains or return 15 cents.

Financial and Corporate

Georgia Consolidation Concluded

Consolidation of six Georgia public utility companies into the Georgia Power Company has been completed with the issuance of a charter to the new company by Secretary of State S. Guyt McLendon. The new company begins operation at once.

Simultaneously with the granting of the charter the Georgia Power Company acquires title to and control of properties formerly operated by the Athens Railway & Electric Company, Georgia Railway & Electric Company, Georgia Railway & Power Company, East Georgia Power Company, Rome Railway & Light Company and the constituent Georgia Power Company, the last named including properties formerly belonging to the Athens Gas Light & Fuel Company, Georgia Southern Power Company, Georgia Utilities Company and Milledgeville Lighting Company.

In addition to the above companies subsidiaries of the new company include the Central Georgia Power Company, Macon Railway & Light Company and Macon Gas Company, serving the Macon district; the Mutual Light & Water Company, operating in Brunswick, and a number of others.

Officers of the new company, as designated in the charter, are: H. M. Atkinson, chairman of the board; P. S. Arkwright, president; G. W. Brine, Charles G. Adsit, F. L. Butler and F. P. Cummings, vice-presidents; W. H. Wright, secretary; I. S. Mitchell, Jr., treasurer; F. R. Mitchell, assistant treasurer; B. T. Simpson, assistant secretary, and Stephen A. Dawley, assistant secretary. With the exception of Mr. Cummings and Mr. Dawley, who reside in New York, all of the officers are of Atlanta.

Merger of the companies brings to an end, so far as names are concerned, some of the oldest utility companies in Georgia. At the same time it increases their scope of service in the new company. One of the oldest of the companies is the Georgia Railway & Electric Company, which came into existence in 1902. While this company continued to exist until the present, all of its properties were leased to the Georgia Railway & Power Company, organized in October, 1911.

The organization of the latter company was the first real step in the development of Georgia's vast water power resources, as it immediately undertook the development of the Tallulah, Tugalo and Chattooga Rivers in North Georgia, and this year will complete the last of a chain of six water power plants on these rivers, which have a total capacity of 284,500 hp. of electrical energy.

In addition to serving Atlanta with electricity, gas, steam heat and transportation, the Georgia Railway & Power Company has rendered service to many other towns and cities in the state. It was the largest of the companies involved in the consolidation and also the largest in the state.

The Athens Railway & Electric Company came into existence in 1910, and besides furnishing Athens with electricity, gas and transportation service, it also developed three water-power sites adjacent to Athens.

The Rome Railway & Light Company was chartered in 1906 and furnished electric light and transportation service to Rome.

The Georgia Southern Power Company, which served Dublin and surrounding territory, was organized in 1925. The Milledgeville Lighting Company was chartered in 1924.

St. Louis Sale Recommended

Special Master Williams in a report to the federal court on Feb. 24 recommended foreclosure sale of the properties of the United Railways, St. Louis, Mo., under a $9,790,000 issue of St. Louis Transit Company bonds in default since last October.

In this connection it has been indicated that United States District Judge Faris about March 20 will fix a date for the sale of the properties under foreclosure, as recommended by Mr. Williams. The court is also expected to fix the minimum or "upset" price at which the properties may be purchased. The foreclosure sale would quickly terminate the receivership, which began in April, 1919.

The recommendations of the special master was based on hearings for foreclosure under the mortgages securing the $9,790,000 St. Louis Transit Company 5s, the $4,500,000 St. Louis & Suburban general bonds and $3,000,000 of St. Louis & Meramec River Railway bonds. Interest on the Transit and the Suburban bonds has been in default since Oct. 1, 1926, and on the Meramec River bonds since Nov. 6, 1913. The bonds of the latter are held merely as collateral security for the Suburban generals. The Suburban general bonds cover that part of the car system taken over when the properties of the St. Louis & Suburban Railway were purchased by the St. Louis Transit Company.

The St. Louis Public Service Company has already been formed to acquire the United Railways properties at foreclosure sale. This company has been negotiating with city officials for a new franchise under the service-at-cost system, but no agreement has been reached on the rate of return to be allowed the company, nor on some tax questions, referred to elsewhere in this issue.

Financing of Porto Rico Railways Purchase Arranged

For the purpose of acquiring the Porto Rico Railways, Ltd., Ponce, P. R., and for extending and improving controlled properties, offering is made of $3,000,000 of 6½ per cent 30-year gold debentures of the International Power Company, Ltd., a public utility holding and operating company, which controls properties in Bolivia, British Guiana, Newfoundland, Porto Rico, Salvador and Venezuela. The debentures are offered by Royal Securities Corporation, Ltd., and G. E. Barrett & Company at 100 and interest yielding 6½ per cent and mature March 1, 1957. They are redeemable on 30 days notice at 105 and interest, payable at the rate of $4.86⅝ to £1.

Purchase in Norfolk Arranged

The stockholders of the Virginia Electric & Power Company, Richmond, Va., a subsidiary of the Engineers Public Service Company, have voted favorably on the propositlon to acquire the Norfolk Railway & Light Company, which is now operated by the Virginia Electric & Power Company under a 99-year lease entered into June, 1906. The Virginia Electric Company will acquire the capital stock of the Norfolk company on a basis of $33 a share in cash or one share 6 per cent cumulative preferred stock and $9 cash for each three shares of the latter. The Virginia company already owns 62,400 shares of the 66,000 shares outstanding of the Norfolk company.

Seattle Tax Decision Stands

The decision of the lower courts that the city of Seattle, Wash., must pay the Puget Sound Power & Light Company $545,370 to reimburse the company for taxes paid on the railway lines sold by the company to the city in 1919, together with interest, will stand. The United States Supreme Court on Feb. 28 refused to grant a writ of certiorari to review the case. Each side had appealed, the company from a decision by the Court of Circuit Appeals, which modified the decree of the District Court so as to provide payment from a special fund, and the city from the entire order. In a decision some months ago the Supreme Court held in a related case that the contract by which the company sold the street railway to the city was binding upon the city to pay the taxes for the year in which the sale was made.

Local Company Not Interested in Washington Interurban

The Washington Railway & Electric Company, Washington, D. C., has rejected a proposal that it take over and operate the Washington-Virginia Railway, now in the hands of receivers. The proposition which the Washington company was considering did not involve outright purchase of the holdings of the Washington-Virginia line, but called for a plan of joint control with certain Virginia interests, it was learned. Recently an announcement was made by the receivers that the holdings of the interurban would be sold at public auction.

The company operates electric cars from Twelfth Street and Pennsylvania Avenue over one double-track line to Arlington Junction, Va., where separate lines diverge to Alexandria and Mount Vernon and to Clarendon, Falls Church and Fairfax. The railroad also operates a bus line over the Lee Highway to Fairfax.

Twin City Expands

Net Income in Minneapolis and St. Paul in 1926 Shows Gain—Taxicab Control

The total operating revenue of the Twin City Rapid Transit Company and its subsidiary companies of Minneapolis and St. Paul, Minn., for the year ended Dec. 31, 1926, was $13,945,266, an increase of $1,566,914 as compared with the year previous. Total operating expenses were $10,322,488, compared with $9,234,088 for 1925. These facts were included in the annual statement of Horace Lowry, president of the company, to the stockholders.

CONSOLIDATED INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY*

	1926	1925
Revenue from transportation	$13,825,851	$12,269,156
Revenue from other operations	119,415	109,196
Total operating revenue	$13,945,266	$12,378,352
Way and structures	$1,201,892	$1,215,796
Equipment	1,106,303	1,129,065
Power	1,198,256	1,270,698
Conducting transportation	4,475,622	4,391,692
Traffic	46,492	36,233
General and miscellaneous	1,217,687	1,248,919
Transportation for investment—Credit	*39,544*	*58,317*
Motor bus expense	1,115,778	......
Total operating expenses	$10,322,488	$9,234,088
Net operating revenue	$3,622,778	$3,144,263
Taxes assignable to operation	1,229,115	1,291,137
Operating income	$2,393,662	$1,853,125
Income from unfunded securities and accounts	$50,199	$73,045
Miscellaneous income	6,298	49,666
Net income miscellaneous physical property	......	61,918
Total non-operating income	$56,498	$184,631
Gross income	$2,450,161	$2,037,757
Rent for leased roads	$3,000	$3,000
Interest on funded debt	995,520	988,954
Interest on unfunded debt	5,887	......
Miscellaneous debits	7,311	8,375
Net loss miscellaneous physical property	1,636	......
Total deductions from gross income	$1,013,355	$1,000,329
Net income transferred to profit and loss	$1,436,805	$1,037,427

*The income statement for 1926 includes the operations of the Twin City Motor Bus Company.

The net earnings of the company's buses for the year 1926 were small because complete control and operation of all the bus lines operating between the cities of Minneapolis and St. Paul and local lines was not acquired until during the early part of 1926 and it required some months to obtain the authority necessary to consolidate operations on an efficient basis. The report stated that the management was satisfied that the operation of the bus properties would earn a much larger return during 1927.

During the latter part of 1926 a prominent Minneapolis investment house secured control of practically all of the taxicab companies operating in Minneapolis and St. Paul, as well as some outside points in the state, and was about to make an offering of the stock of the consolidated taxicab company. The railway management recognized that if this stock became scattered at the time it would be impossible for the company to enter that field of transportation in the future and for that reason, on Jan. 4, 1927, acquired a controlling interest in the taxicab combination. Mr. Lowry said that in view of the constantly increasing use of the motor-driven vehicle it seemed imperative that the Twin City Rapid Transit Company should engage, as far as possible, in all forms of public transportation, and inasmuch as it was already operating the local and intercity bus lines, it was only logical that the operation of the taxicab business should also be taken over.

The unification of the various competing cab companies will increase materially public transportation by the elimination of congestion, according to the management, which is satisfied that the Twin City Rapid Transit Company will be paid a fair return on its investment which has been made by it in the taxicab business.

During 1926 the company earned sufficient to pay regular quarterly dividends at the rate of 7 per cent per annum on its preferred stock and paid four quarterly dividends of 1¼ per cent on the common stock, which is 1 per cent more for the year than was paid during 1925.

Mr. Lowry referred to the previous report, which called attention to the provision in the commission's order fixing the rate of fare in the city of St. Paul. He referred to the general election in November on the city charter amendments for St. Paul and their non-passage by the voters, because of the fact, he said, that any voter not voting on the question at a general election had the effect of counting as a vote against the measure. He said that the management was now urging the St. Paul City Council to call a special election at which the city charter amendments only would be submitted. If the city did not take this action the company would be forced to seek other relief.

PROFIT AND LOSS ACCOUNTS OF THE TWIN CITY RAPID TRANSIT COMPANY*

Balance Jan. 1, 1926		$1,866,347
Additions for the year		1,436,805
Net adjustments	$30,247	
Dividends on preferred stock	210,000	
Dividends on common stock	1,100,000	
Balance carried forward	1,962,905	
	$3,303,152	$3,303,152

*The consolidated statements this year include the accounts of the Twin City Motor Bus Company.

CONSOLIDATED STATISTICAL REPORT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1926	1925
Total revenue	$14,001,764	$12,562,983
Total operating expense	$10,322,488	$9,234,088
Net revenue	$3,679,276	$3,328,895
Revenue passengers carried	190,826,784	200,783,106
Transfers redeemed	69,248,145	72,814,559
Operating, per cent of revenue, taxes included	82.50	83.78

STATISTICAL STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

Track-miles, all track reduced to single track	504.53
Total car-miles operated	29,297,108
Gross passenger car revenue	$12,603,215.75
Revenue passengers carried	185,711,950
Transfer passengers carried	68,917,932
Revenue passengers per car-mile	6.34
Total passengers per car-mile	8.69

Stark Electric After Canton Lines

Negotiations for control of the city railway lines at Canton, Ohio, have been opened by officials of the Stark Electric Railroad, Alliance, Ohio, with offices of the Northern Ohio Power Company, which operates the Canton lines. The franchise of the Northern Ohio Power is about to expire. Launching plans for new operating rights that company asked the Council at Canton for an exclusive grant.

If this deal is consummated the Stark Electric will double its mileage. At present the company owns 30 miles of interurban track from Canton to Salem. The Canton system consists of 30 miles of track.

There have been several conferences between officials of the two companies, but no definite action has yet been taken. The outcome, according to E. W. Sweezy, general manager of the Alliance company, depends on the degree to which the Canton City Council cooperates with the Stark Electric in the proposal. Action in taking over the Canton city lines will not affect present interurban service to Canton and other near-by cities by the Northern Ohio Power Company. That company will continue to operate the intercity lines, surrendering only the city routes to the Stark.

Seattle & Rainier Property Tax Discussed

A resolution urging the City Council of Seattle, Wash., to enforce collection of a delinquent franchise tax owed by the Seattle & Rainier Valley Railway has been shelved by the Council utilities committee. The resolution, submitted by the Commonwealth Club, which is fighting the proposed purchase of the valley line by the city, states that over a period of years the railway is now in arrears approximately $75,000 in taxes. It was pointed out that the City Council, in closing the contract, to be voted on March 8, allowed in the price for the tax.

A new plan for collection by the city of the tax due has been proposed by Councilman Oliver T. Erickson and has been drafted in an ordinance by T. J. L. Kennedy for presentation to the City Council. Under present arrangements, the line exacts a 10-cent cash fare from patrons desiring a transfer to the municipal car lines. Of this 10 cents, half goes to the Seattle Municipal Railway and half to the company. Mr. Erickson proposes that the Rainier line reduce its fare, with privilege of transfer to the city-owned line, to 8⅓ cents, with the understanding that the city will credit the system with 1⅔ cents on each transfer accepted from the company's line, the amounts so credited to apply on franchise debt owed the city.

Wichita Property Reported Sold

Reports have it that the railway and bus lines run by the Wichita Railroad & Light Company, operating in Wichita, Kan., are to be taken over early in March by the Wichita Transportation Company. The latter corporation, it is said, is headed by Howard V. Wheeler, Robert B. Campbell and R. C. Clevenger, local capitalists.

Three Miles of Line Sold.—The board of directors of the Fort Loramie Railway, Fort Loramie, Ohio, and officers of the Western Ohio Traction Company recently completed the sale of 3 miles of railway line to the Western Ohio Traction Company of Lima. The latter company is now in possession of the holdings. The line was built in 1911 by the citizens of the section from Fort Loramie to Minister.

More Passengers Carried.—During the fiscal year ended Jan. 31, 1927, the Chicago Surface Lines, Chicago, Ill., carried 1,574,969,802 passengers, against 1,518,510,661 in the previous fiscal year, or an increase of 56,459,141 rides. Traffic handling facilities during 1926 were increased with the addition of 100 new cars and more than 99 per cent of the 3,639 cars now owned by the system are in service. October, 1926, marked the month of largest traffic for the system, when 135,878,579 passengers were carried. This exceeds by 2,929,063 rides the previous high monthly record made in December, 1925.

Rental Payment Declared on Manhattan Stock.—The regular quarterly dividend rental of $1.25 a share on stock of the Manhattan Railway is announced subject to the plan of readjustment by directors of the Interborough Rapid Transit Company, New York, which controls the former by lease.

Equipment Being Scrapped.—Scrapping of local railway and interurban equipment of the Ohio Service Company, Coshocton, has been started in Cambridge, Ohio. The work is being done by the E. P. Gaynor Company of Wheeling, W. Va. The company suspended its railway service between Cambridge and Pleasant City on Feb. 1. Bus service has been started in Cambridge and to points south, which had been served by the interurban line.

B.-M. T. Bond Rise in Effect.—The increased price for 6 per cent bonds of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., on sale by the War Finance Corporation went into effect on Feb. 15. Of an original offering of $18,199,200, the corporation has $10,262,000 unsold, the same total as on Feb. 3, when the increase in price was announced. The bonds are now offered at par and accrued interest against the price of 99½ and interest asked when the securities were first put on sale.

New Financing Arranged.—Day & Zimmermann, Inc., announce that the Southern Ohio Public Service Company, Zanesville, Ohio, has completed arrangements with Harrison, Smith & Company and Howes, Snow & Bertles, Inc., for new financing. Within the next few days, $2,100,000 first mortgage bonds will be offered, from the proceeds of which the company will pay off $690,750 first and refunding mortgage 6 per cent bonds of Southern Ohio Public Service Company. These will be called and redeemed on or about April 15, at 105, with accrued interest. The company is also paying off at par March 1 $1,000,000 Zanesville Railway Light & Power Company 6 per cent bonds. The Southern Ohio Public Service Company is the successor to the Columbus, Newark & Zanesville Electric Railway.

Legal Notes

ALABAMA—*Highest Degree of Care Must Surround Passengers.*

In a suit by a passenger who was thrown from the steps of a trolley car, as she was alighting therefrom, to the pavement, which was muddy and rough and which had been torn up by the defendant, in preparation of its resurfacing, the court charged that the duty of the railway was to exercise the highest degree of care and provide reasonably safe and convenient places for their passengers to ride, and see that no danger befalls them in and about the duty of their agents in carrying passengers on their cars. [Birmingham Elec. Co. vs. Sheppard, 110 Southern, 604.]

CALIFORNIA—*The Automobile Driver Is Not Without Responsibility.*

Plaintiff who was injured was a passenger in an auto, driven by her son, which was struck by a trolley car as it crossed the tracks. There was proof that the auto had been proceeding at a speed from 20 to 40 miles an hour; that the approach to the tracks was somewhat obstructed, but that the car could be seen at a distance more than 200 ft. west of the crossing; that the car bell was rung for a considerable distance from the crossing, and when about 50 to 60 ft. from the crossing the operator saw the auto for the first time about 6 to 8 ft. from the tracks. It was held that the last clear chance doctrine was only applicable to a defendant who actually perceived danger of plaintiff in time to avoid the accident by exercise of due diligence and it could not be held liable on the theory that it should have discovered the peril. [Chappel vs. San Diego & A. Ry., 251 Pac., 321.]

KENTUCKY—*Window Sash Falling on Passenger's Arm Not Necessarily Due to Company Negligence.*

Appellant's elbow had been resting on the window sash and the window fell, injuring his elbow. The contention was that the sash which fell was under the exclusive control of the carrier, and since window sashes, if in good order and properly fastened, do not fall, there arose a presumption of negligence. The proofs failed in this respect. The court took notice that window sashes are often raised and lowered by passengers acting independently and therefore the doctrine of *res ipsa loquitur* does not apply. [York vs. Cincinnati N. O. & T. P. Ry., 288 S.W., 750.]

MISSOURI—*Humanitarian Doctrine Held Inapplicable to Pedestrian Hit by Rear of Car.*

A person standing too near the track when a car rounded a curve was struck by the rear end. The motorman could not know the pedestrian would not step back to avoid the end of the car, especially as he had to look forward to avoid traffic. To recover under the humanitarian doctrine, the plaintiff must be seen in a position of imminent danger immediately impending, actually or constructively known to the defendant, and he must then fail to exercise ordinary care (proportionate to the calls of that danger), to avoid injury to the plaintiff. [Siegel vs. Wells, 287 Southwest. Rep., 775.]

MISSOURI—*Boy Climbing Tree Injured by Charged Guy Wire.*

A boy 13 years old, climbing a shade tree in a parkway, came into contact with a guy wire, originally installed by a telephone company, against which two sagging live wires of a power company had come in contact. The power company was held responsible. [Shannon vs. Kansas City L. & P. Co., 287 Southwest. Rep., 1031.]

NEW JERSEY—*Bus Drivers Must Not Turn Without Warning.*

A driver of a bus suddenly and without warning slowed down and turned to the left, crossing the entire width of the road. Plaintiff, who was following the bus in his auto, was forced off the road into a ditch, damaging his auto and injuring passengers. The court held that the jury was justified in finding negligence on the part of the bus driver. [Winter vs. No. Jersey Bus Co., 135 Atl., 473.]

NEW YORK.—*Sale of Bus Franchises in Cities of the Second Class.*

A statute requires franchises in cities of the second class to be sold at public auction to the highest bidder and provides regulations as to the giving of security, etc. The city of Yonkers offered certain bus franchises for sale, but reserved the right to reject any and all bids if not reasonably satisfied as to "the good faith, responsibility and legal capacity of the bidder or bidders." This clause was held not in accordance with the statute and tending to discourage bidders, hence would make the sale illegal. The ordinance also required the bidder to accept only a portion of a route if any such portion was considered a public convenience and necessity by the Public Service Commission. This also was considered illegal by the courts as it required the bidder to accept a franchise he did not bid for and which the common council did not sell. The proper course would be that if the route approved by the commission was materially different from that sold, the bidder should not be compelled or permitted to accept it. A provision in the ordinance requiring the bidder to connect with stations on a subway were held valid as they did not make the franchise indefinite and uncertain. [Yonkers R. vs. City of Yonkers, 218 New York Supp., 103.]

NEW YORK.—*State Controls Rapid Transit in Cities Unless It Has Divested Itself of that Power.*

An attempt was made to hold a city referendum by which the electorate of New York City might instruct the Board of Estimate as to its duty on rapid transit policies. On the plea of a citizen and elector, the City Board of Elections was required to omit from the ballot all reference to this matter. The State Court of Appeals held that the plan proposed was an attempt to supersede the State legislature and to take from the Board of Estimate certain powers and duties which had been conferred on it by state legislation. The plan also proposed to take away powers which the state had confided to the Public Service Commission. In the matter of rapid transit regulation, the cities of the state have not been fully emancipated from the power of the legislature. For these and other reasons given in its decision, a mandamus was granted. [McCabe vs. Vorhis et al., 153 Northeast. Rep., 849.]

NEW YORK—*Autoist Thought He Saw Red When That Was Impossible.*

A verdict was recovered as a result of a collision of a car and auto. One witness testified that as the car passed him it had a red headlight on it. All other proofs submitted were that the car was in proper operating condition; that a red headlight could only be shown as a headlight when the operator turned the so-called reverse lever in neutral position, in which case power could not be so transmitted to propel the car in either direction. The verdict was set aside, as against the weight of the evidence. [Baldwin vs. International Ry., 218 N. Y. Supp., 599.]

OHIO—*Attempt by Bus Operators to Preserve Individual Identity but Operate as a Unit.*

The Public Utilities Commission had issued certificates for the operation of buses to certain individuals along a state highway, in competition to the service furnished by the petitioner. An application was made by the petitioner to revoke the certificates on the ground that the holders thereof were operating as a partnership under the name of Red Star Transportation Company and that they had obtained the certificates of convenience and necessity by representing themselves to be engaged in operating as individuals when they were in fact a partnership and that they had renounced their certificates by operating as a partnership. The proof showed that the individuals had employed a common manager, had a joint schedule, shared certain expenses and purchased certain equipment from common funds. It was held that unless the evidence also shows that such operators so taking the profits shared them not only as principals in a joint business, but that each had an express or implied authority to bind the other as principal and agent, the relief played for will not be granted. [So. Ohio P. S. Co. vs. P. U. Commission of Ohio, 154 N. E., 365.]

WASHINGTON — *Certificate Properly Withheld from Bus Company, Even Though Promising Through Service.*

The Department of Public Works properly denied the application for a certificate for operation of through bus service between two towns where existing bus service required two transfers. However, in each of these two cases the transfers were made in the same bus station, through tickets were sold and no complaint had been filed that this service was inadequate or insufficient for the public need. [State vs. Department of Public Works et al., 250 Pacific Rep., 1088.]

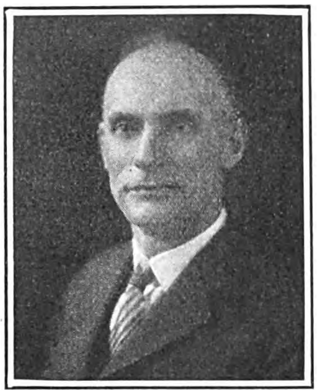
Personal Items

Del A. Smith General Manager at Detroit

Official Who Has Been Acting Manager of Municipal Railway Is Named to Succeed H. U. Wallace

Del A. Smith has been named general manager of the Detroit Department of Street Railways, Detroit, Mich., by the Street Railway Commission. He was made assistant general manager of the municipal system on Dec. 15, last, and became acting general manager on Jan. 1, when the resignation of Col. H. U. Wallace, former general manager, became effective.

During the absences of Col. Wallace last year, Mr. Smith had active charge of the municipal system and demonstrated his ability and his knowledge of street railway operations. His former appointment as assistant general manager filled a vacancy in that office which had existed after the resignation of H. M. Gould.



D. A. Smith

Mr. Smith has worked up through the ranks in various positions from conductor in the interurban service.

His electric railway experience began in 1905 when he started as conductor on the Jackson division of the Detroit United Railway, the Detroit, Ypsilanti, Ann Arbor and Jackson line. Prior to that he had been in the train service of the Chicago, Milwaukee & St. Paul Railroad. He was made carhouse foreman with the Detroit United lines in 1907. From that position he was promoted successively to assistant division superintendent in 1911, night superintendent in 1916, supervisor of fare collections in 1918 and division superintendent in 1919.

On May 15, 1922, he was transferred to the Department of Street Railways with the city lines when they were taken over by the city from the Detroit United Railway. He was made assistant superintendent of transportation in July, 1922, and superintendent of operation on Dec. 1, 1924. His next promotion was to general superintendent, Nov. 9, 1926, which position he held until he was made assistant general manager.

Mr. Smith's appointment as general manager was made by Street Railway Commissioners John J. Barlum and H. H. Esselstyn. The third member of the commission, G. Ogden Ellis, is making a world tour, but it was announced that Mr. Smith's appointment had his full approval. The salary of the new general manager is $12,000 a year.

Following the appointment several improvements and extensions of the municipal lines suggested by Mr. Smith were approved by the commissioners. The estimated cost of the extensions totals $280,000 and work will start as soon as weather permits. All the improvements and extensions are to be financed out of the revenues received from the lines. It was also announced by Mr. Smith that the Detroit Municipal Railway has begun the rehabilitation of about 1,000 cars, the work being done in the Highland Park shops. It is planned to continue this work at the rate of about 100 cars a month.

Mr. Smith's appointment has been very highly approved by his associates and other employees of the municipal system, whose interests he has at heart and whose problems he understands by virtue of his past practical experience. His selection was also pleasing to city officials in departments with which he has come in contact and co-operated during his long service with the street railway.

Other Changes in Stone & Webster Personnel

In furtherance of recent changes in the personnel of the Stone & Webster management announcement has been made of the following assignments:

George H. Clifford, formerly district manager of the companies located in the southwestern district, has been appointed division manager in charge of companies located in the southwestern district, the Virginia Electric & Power Company and subsidiaries and the northern district properties of Eastern Texas Electric Company (Delaware corporation). Mr. Clifford's headquarters will be in the Boston office beginning April 1.

Walter H. Burke, formerly manager of the Northern Texas Traction Company and Tarrant County Traction Company, has been appointed district manager of the companies in the southwestern district, comprising the properties located in Texas, Louisiana, New Mexico and Mexico. After March 15 Mr. Burke will be located at Houston, Texas.

Alfred F. Townsend, formerly manager of the Florida Motor Lines, Inc., and its affiliated companies and vice-president of Florida Motor Lines, Inc., has been appointed manager of the Northern Texas Traction Company and Tarrant County Traction Company.

Philip M. Wentworth, formerly manager of Cape Breton Electric Company, Ltd., has been appointed manager of Florida Motor Lines, Inc., and its affiliated companies, and elected vice-president of Florida Motor Lines, Inc.

Leon E. Seekins, formerly assistant to the manager of the Lowell Electric Light Corporation, has been appointed manager of the Cape Breton Electric Company, Ltd.

Luke C. Bradley, formerly president of the Virginia Electric & Power Company, assumed his new duties as president of the Rhode Island Public Service Company on Feb. 20.

William E. Wood is now president of the Virginia Electric & Power Company.

The two last-named changes were announced in the ELECTRIC RAILWAY JOURNAL issue of Feb. 12, page 313.

Los Angeles Superintendents Exchange Positions

Ernest R. Dye, superintendent at Division 3 of the Los Angeles Railway, Los Angeles, Cal., and George E. Ferguson, superintendent at Division 5, exchanged positions on Feb. 15.

Superintendent Dye went to the company in 1899, serving as a conductor out of Division 1, and was later transferred to Division 5. He resigned from the service in February, 1902, but was re-employed as conductor at Division 1 in August, 1903. In August, 1919, he became extra student instructor at Division 5, regular instructor in February, 1920, and was made superintendent of Division 3 in February, 1921.

Superintendent Ferguson entered the service of the company in October, 1905, as conductor out of Division 2. He resigned in April, 1912, and was re-employed a year later as motorman. In February, 1914, he was made extra dispatcher, and regular dispatcher in June, 1917. About three years later he entered the schedule department, was made special representative of the superintendent of operation in April, 1921, acting division superintendent of Division 5 in May, 1924, and regular superintendent of that division in January, 1925.

Neal Brewster was nominated by Governor Smith, and his name sent on Feb. 28 to the Senate for confirmation as a member of the Public Service Commission, to fill the vacancy caused by the expiration of the term of Charles Van Voorhis. Mr. Brewster was born at Weedsport, Cayuga County, N. Y., Jan. 30, 1879. He was graduated from Syracuse University in 1902 and was admitted to the bar the same year. Since that time he has been engaged in the practice of law in Syracuse, being a member of the law firm of Lee, Brewster & Johnson. He was Collector of Internal Revenue at Syracuse from 1915 to 1920 and City Comptroller of Syracuse from 1922 to 1926.

Sir J. Henry Lamperd, traffic expert of Melbourne, Australia, and head of the traffic system there, is on a visit to the United States to study traffic regulation. He arrived in Philadelphia recently for a brief study of Philadelphia's Traffic Bureau. He intends to survey conditions in other large American cities.

Richmond's New President

"Will" Wood Has Been with Stone & Webster Twenty Years in Many Capacities

Just twenty years ago a youth fresh from algebraic tussles at the Georgia Institute of Technology entered the already famous office of Stone & Webster at Boston to match his ingratiating South Carolinian accent against the more customary twang of the resident Yankees. It was "Will" Wood, and "Will" Wood it has remained to this day, although the more formal cognomen of "W. E. Wood" has been gracing more and more important documents with the passing years.

To be "cabined, cribbed, confined" to an office stool was not to young Wood's liking. After a year in Boston, he was transferred to Jacksonville to go through a realistic course of nuts to soup, viz., from the nuts on the controller to the superintendency of the Jacksonville Traction Company in the period 1907-1912.

Rising Stone & Webster men appreciate the adage that "a rolling stone gathers no moss," barnacles or other impedimenta toward an unclogged judgment. In 1916 "Will" Wood made his first shift by going to Houston as general superintendent. A little later he learned something of the noble width of Texas in becoming superintendent of the El Paso Electric Company, but in 1918 he returned as a neighbor to Houston in becoming local manager of the Galveston Electric Company. Two years later saw him manager of the Houston Electric Company and the Galveston-Houston Electric Railway.

W. E. Wood

UNDER MR. BRADLEY'S EYE

In these Texan years the ability, sincerity and likableness of "Will" Wood had been noted at first hand by the keen, kindly eyes of Luke C. Bradley, manager of the southwestern district of Stone & Webster. So when that firm took over the Virginia Railway (now Electric) & Power Company, with Mr. Bradley as president of the new concern, it was "Will" Wood who was invited to become ranking vice-president.

These two men, with other able companions brought up from Texas, took the reins at Richmond on July 1, 1925. Within the next year and a half the brilliant results accomplished there in better public relations led to a flattering offer to Mr. Bradley to accept the presidency of the Rhode Island Public Service Company, Providence, R. I. With twenty years service in the Stone & Webster organization, "Will" Wood, in February, 1927, had become president of one of its largest properties. Thus, the bare outline of achievement.

As "Will" Wood toiled upward, he never forgot to help his fellow-workers on or off the property. The records show that almost from the first he was an eager worker in territorial associations for mutual service. In 1925, his last year in Texas, he was elected president of the Southwestern Public Service Association. Perhaps he treasures even more than this honor from fellow-craftsmen the warm-hearted message which a group of big Houston men spread on the parchment, when he left for Virginia, to let him know he was loved as a man and respected as a useful citizen whose place in community affairs would not be easily filled.

As for the utility men of the Old Dominion, they waited no longer than the first convention to which Mr. Wood was a delegate to make him their president.

"How do they do it?" is the question always asked about men who get there. No copybook maxims will be quoted about "Will" Wood, but let this comment of a co-worker suffice: "He's so square and good-natured that you just can't get mad at him."

Obituary

Charles Sidney Baxter died recently at his winter home in Miami, Fla. He was in his 60th year. He was admitted to the bar in 1895 and for some years was in charge of the law department of the Boston Elevated Railway, Boston, Mass. He was Mayor of Medford, Mass., for four years and took an active part in many political campaigns.

Edward Carpenter Wood, president of the Mica Insulator Company of New York City, Chicago and Schenectady, N. Y., died on Feb. 17 in New York. Mr. Wood was a pioneer in the mica insulation industry and played an important part in the development of "Micanite," which was put on the market by the Mica Insulator Company in 1893 and of which the company has been the sole manufacturer ever since. Mr. Wood had been identified with the Mica Insulator Company since its inception in 1893.

Edwin Samuel Ely, consulting engineer for the Virginia Electric & Power Company, now under Stone & Webster management, died on Jan. 16 at Norfolk, Va. He had rendered a truly valuable service to his company, and, after all, a service in favor of the community. Through the 25 years that he was associated with the system and its people he was always to be found the same—a dealer in kindliness and fair play toward his friends and business associates and a clean influence for good throughout the organization.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Central Western Roads Go Ahead

Expenditures for Rolling Stock Feature $7,500,000 Programs of Nine Ohio Companies

Many electric railways in Ohio are planning betterments and improvements of rolling stock and equipment this year.

The Cincinnati Street Railway proposes capital expenditures in the amount of $3,000,000. This will go toward new shops, additions and betterments to way and structures and miscellaneous improvements.

The Cleveland Railway is planning an expenditure of $2,050,000 for carhouses, new cars and buses.

While the Community Traction Company, Toledo, has not definitely decided on the new capital expenditures for this year, due to the fact that the proposed ordinance under which such expenditures would be made has not been passed, it is estimated that approximately $1,500,000 is required for rehabilitation not absolutely essential to the operation of the property but highly desirable.

The Chillicothe Electric Railway, Light & Power Company and the Ohio Utilities Company, which are owned and operated by the same interests, will expend $500,000, but the bulk of it will go toward the electric light department.

The Wheeling Traction Company, which operates in Washington, Jefferson and Belmont Counties, Ohio, probably will spend from $200,000 to $250,000 on track and roadway in Belmont County this year. In this instance it seems unlikely that any new rolling stock will be acquired during this year.

According to J. M. Pogue, general manager of the Indiana, Columbus & Eastern Traction Company, with headquarters in Springfield, Ohio, about $130,000 will be expended this year. Of this amount $80,000 will go toward track improvements and $50,000 toward new freight equipment.

The Cleveland Southwestern Railway & Light Company will expend approximately $75,000 for way, structures and power.

Track of the Steubenville, East Liverpool & Beaver Valley Traction Company east of Steubenville will be relocated at a cost of about $30,000.

The Dayton & Western Traction Company is committed to no fixed program of capital expenditure.

The Toledo & Western Railway, the Lima-Toledo Railroad and the Lima City Street Railway have not made their estimates for 1927 up to this time.

The Lake Shore Electric Railway will spend $150,000. New car seats will cost $30,000, snow-fighting equipment $10,000, overhead construction $100,000 and track improvement $10,000. The Lorain Street Railroad, controlled by the Lake Shore, will spend $100,000, of which $60,000 will go toward passenger cars and $25,000 for substations and $15,000 for carhouses.

Lead Production Higher

January lead production by countries which supplied about 85 per cent of the world's output in 1925 was calculated last week at 131,783 tons, compared with 118,845 tons in January, 1926. The monthly average output in 1926 was 122,023 tons.

First Reservation Sought for Car Space at Cleveland

Fred Dell, director of exhibits of the American Electric Railway Association, announced on March 4 that he had received his first request for track space at the Cleveland convention. J. R. Blackhall, vice-president of the Chicago & Joliet Electric Railway, Joliet, Ill., has indicated that he will show a new type of city car in Cleveland next October. One of the interurban cars of this company was exhibited at Cleveland last year by the Cummings Car & Coach Company. The receipt of this request for reservation of space seven months prior to the convention indicates quick response to the appeal of President Sawyer to the industry for a representative car exhibit.

Electrification Extended by Mexican Railway

The officials of the Mexican Railway Company, Ltd., have arranged for the extension of the electric zone now operating over the Maltrata Incline eastward to Paso del Macho, a distance of about 22 miles. The most difficult portion of this grade section was converted to electrical operation in 1924, and during the past year an additional 17 miles was placed in service.

The extension now under way will require an additional substation which will be located at Portrero, a short distance east of Cordoba. Equipment for this extension, which will be supplied by the International General Electric Company, includes line material and bonding, and a complete 3,000-kw. substation, to contain two 1,500-kw., 3,000-volt synchronous motor-generator sets with transformers, switchboards and switching equipment. This station will be a duplicate of the present substation except in capacity.

When this extension is completed there will be a total of about 70 miles of electrified track running through the severest grade section of the line between Mexico City and Vera Cruz. Grades run as high as 5.25 per cent maximum, with an average of 4.7 per cent for about 25 miles. The remainder of the electric zone ranges from 2 to 3 per cent. All trains on these grades will be handled with regenerative electric braking and it is expected that the same 150-ton locomotives used on the original electric zone will be used on the extension.

The overhead line will be supported entirely by steel structures fabricated from used rails which the company has on hand. Due to the circuitous route followed by the railway tracks, the entire 70 miles will be fed from two substations. The motive power for the electric zone, all of which was furnished by the International General Electric Company, included ten locomotives of the six-axle type, with a normal hourly rating of 2,700 hp. These have been in service since 1924.

American Brake Shoe Has Record Year

American Brake Shoe & Foundry Company reports for 1926 net profit of $3,029,216, after charges, depreciation and federal taxes. This is equivalent, after preferred dividends, to $15.04 a share on the 156,928 shares of no-par-value common stock. It compares with $2,786,607, or $13.57 a share, on 156,093 shares outstanding in 1925.

The balance sheet as of Dec. 31 shows total assets of $30,108,590, against $28,747,182 at the close of 1925, and a profit and loss surplus of $9,640,486, compared with $8,119,314.

In his report to the stockholders, Joseph B. Terbell, president of the company, writes:

> A new wheel plant is under construction at Toledo, Ohio, similar in design to the new St. Louis plant. The building of this plant is necessary in order to take care of the increasing business in that district.
>
> A further extension of the car wheel company occurred in December by the purchase of the plant and equipment of the New York Car Wheel Company of Indiana, located at Hammond, Ind. Your companies have not heretofore sold wheels in the Chicago territory. The Hammond plant is located on one of the belt lines of Chicago, giving it access to the various railroads entering that city. Based upon the previous tonnage of wheels produced by this plant, we expect the earnings will justify its purchase.
>
> A new brakeshoe plant has been established in Pittsburgh, Pa., by converting the plant of the Pennsylvania Casting & Machine Works into a brakeshoe foundry. With the addition of this plant we now have, with few exceptions, brakeshoe plants at all of the larger railroad centers.
>
> During the year the American Brake Materials Corporation was incorporated to take over the manufacture and sale of "brakebloks" designed for use on automotive equipment. It is expected that by the first of April the corporation will begin operations at Detroit, where new machinery is now being installed.
>
> Our two principal associated companies, the Ramapo Ajax Corporation and the American Manganese Steel Company, have each shown satisfactory results, the latter having enjoyed the largest net earnings in its history.

Time Extended for Work on Texas Interurban

The City Commission at Dallas, Tex., has voted the Dallas Southwestern Traction Company until Dec. 31, 1927, to construct 5 miles of the proposed interurban line from Dallas to Irving.

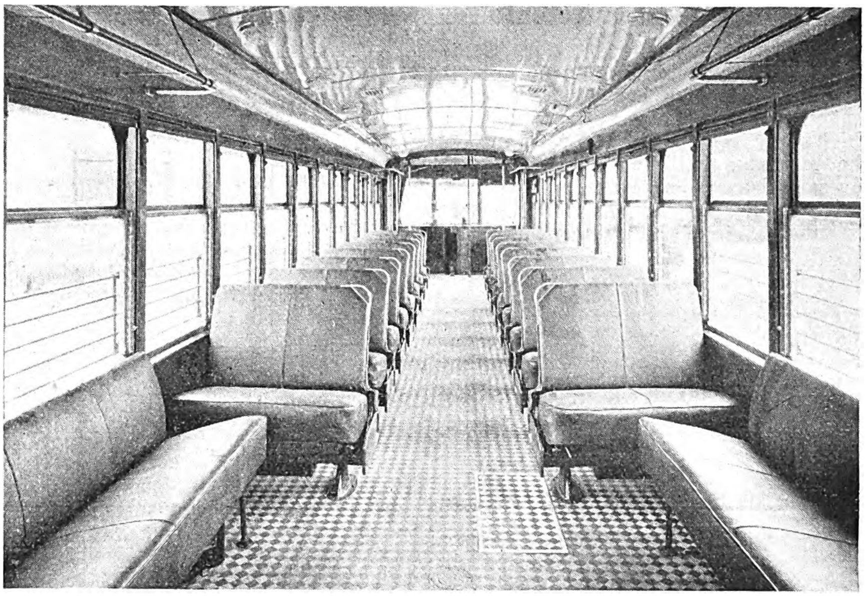
The action was taken at the request of E. P. Turner in compliance with provisions of the charter franchise granted the company and on payment by the company of a forfeit of $1,400 in bonus money of the $15,000 fund originally deposited with the city when the franchise was granted.

Mr. Turner in the application for an extension of time pointed out that at least 82 per cent of the grading for the line already has been completed, but that the company has so far been unable to dispose of bonds for financing the completion of the line.

It originally had been stipulated that the company must have completed 10 miles of the line by a certain date, which has been extended previously from year to year. By the action just taken the City Commission reduced the mileage that must be constructed in the time limit from 10 to 5.

Brill 177-E Trucks for Fitchburg Order

Brill 177-E trucks will be used on the four double-truck safety cars ordered by the Fitchburg & Leominster Street Railway, Fitchburg, Mass., and also on the 25 double-truck safety cars recently ordered by the Eastern Massachusetts Street Railway. In announcing the award of the Fitchburg & Leominster Street Railway order, the JOURNAL inadvertently gave the truck number as 117-E instead of 177-E.

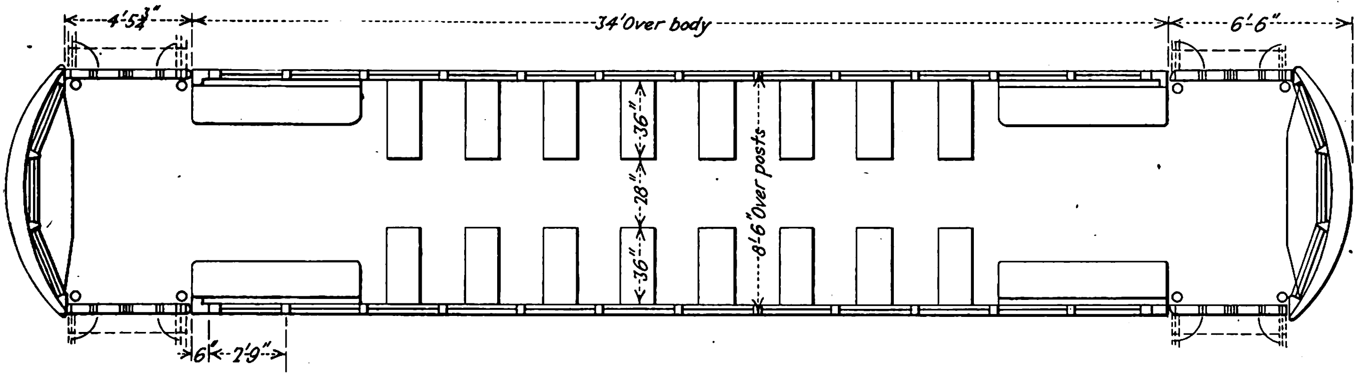


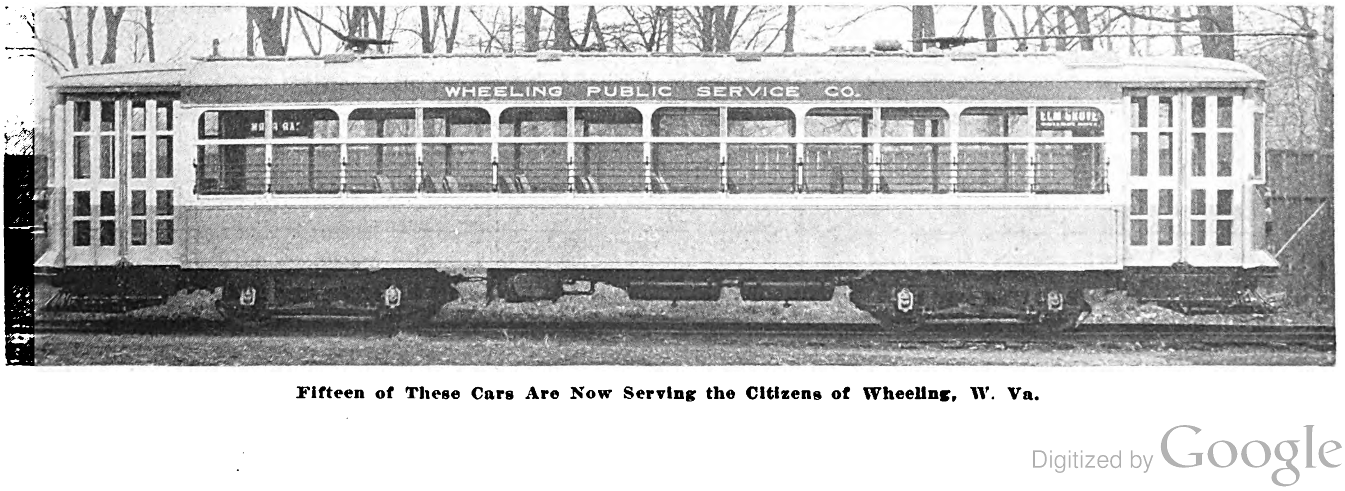
Spacious Interior of the New Cars Recently Delivered by the G. C. Kuhlman Car Company to the Wheeling Public Service Company

Wheeling Company Operating New Cars

Following are specifications for the fifteen double-truck light-weight cars mentioned in the JOURNAL of Sept. 4, 1926, as having been ordered by the Wheeling Public Service Company, Wheeling, W. Va., from the G. C. Kuhlman Car Company, a subsidiary of the J. G. Brill Company. The new cars were delivered on Dec. 27, 1926, and are now in service. Order for the rolling stock was placed July 25, 1926.

Seating capacity	48
Weights:	
Car body	17,600 (estimated) lb.
Trucks	6,110 (including gears) lb.
Equipment	9,420 (estimated) lb.
Total	33,130 (estimated) lb.
Bolster centers, length	24 ft. 0 in.
Length over all	47 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	10 ft. 8 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Kuhlman
Center and side bearings	Brill
Control	K-35
Curtain fixtures	Rex
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Fenders	Steel pilot
Finish	O'Brien enamel
Hand brakes	Brill, vertical handle
Heater equipment	Utility
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Four Westinghouse No. 514-A, outside hung
Sanders	Nichols-Lintern
Sash fixtures	Rex
Seats	Brill 201-B
Seating material	Genuine Spanish grain leather
Slack adjuster	Westinghouse
Springs	Brill
Step treads	Kass
Trolley catchers	Knutson No. 5
Trolley base	U. S. No. 20
Trucks	Brill 177-E
Ventilators	Nichols-Lintern
Wheels	28-in.





Fifteen of These Cars Are Now Serving the Citizens of Wheeling, W. Va.

50 to 100 Cars for Toronto

The Toronto Transportation Commission is to ask tenders on 50 or 100 new cars, the number to be bought depending somewhat on the reduction which may be obtained for quantity. The purchase will be financed out of the commission's own reserves, which are available to the extent of $1,500,000. Chairman Ellis of the commission is reported to have said:

> We anticipate buying the cars in Canada, but will not build them ourselves. They are for use on existing routes. Their purchase will not mean the abandonment of cars already in use—the one-man cars, for instance? They will be additional. The one-man car is thoroughly established everywhere and the technical journals are full of its praises.

Charlotte Company Experiments in Building Cars

Mechanics of the Southern Public Utilities Company, Charlotte, N. C., recently turned out from the company's Charlotte car shops a new 18-ton, 40-passenger car which, with the exception of trucks and air brake equipment, was built from stem to stern by the company's force. The work was under the direction of W. B. Osborne, master mechanic, and the new car cost approximately $10,000.

Rolling Stock

Macon Railway & Light Company, Macon, Ga., if a program suggested to the city is approved, will purchase sixteen new cars and rebuild old ones retained.

Burlington Traction Company, Burlington, Vt., is putting Johnson D. M. fare boxes on its rolling stock in connection with a change to one-man operation.

Market Street Railway, San Francisco, Cal., is planning several new features for the 73 cars now being constructed in its shop. All cars will have crosswise seats, leather-cushioned. In the smoking compartments the latest model rattan and wicker seats will be used. The smokers will be glassed in on one side and open on the other. The open sides will be equipped with tight-fitting storm curtains. When these are in use there will be ample light from the glass windows opposite, and in the heat of summer the glass windows can be lowered.

Jamestown Motor Bus Transportation Company, Jamestown, N. Y., subsidiary of the Jamestown Street Railway, has purchased six 21-passenger buses from the Reo Motor Car Company, to be placed in service on the company's city bus routes. The new buses are of the street car type, with pay as you enter facilities. An especially attractive color scheme has been worked out. The bodies have been painted a Quaker gray, with a town car blue stripe and letterboard.

Western Ohio Railway, Lima, Ohio, has installed its first chair car, and an exhibition trip from Lima to Wapakoneta, Ohio, and return was arranged for a party of officials and guests. The new car is divided into three compartments. The major compartment is equipped with bucket type chairs, fitted with air cushions and luxuriously finished in plush. The seats in the smoking compartment are finished in Spanish leather. The company plans to complete the reconstruction of its cars at the rate of one car a month.

Los Angeles Railway, Los Angeles, Cal., has equipped all of its cars and buses with Johnson D. M. fare boxes, designed to accept pennies, nickels and dimes and also tokens of 0.650 in. diameter. The tokens are being sold six for 50 cents.

Trade Notes

Hubbard & Company, manufacturers of shovels, spades, scoops and railroad track equipment, recently held their third annual sales convention in Pittsburgh, Pa. The meeting was attended by all the company's salesmen, district managers, and three plant managers. In addition to discussing the sales and advertising program, the force heard several stirring sales talks made by officials of several larger manufacturing concerns.

Copper and Brass Research Association announces the appointment of H. A. Call of New York as mid-Western representative. Mr. Call has left New York to establish a branch in St. Louis.

H. D. James has been promoted to consulting control engineer of the Westinghouse Electric & Manufacturing Company, and **E. B. Newill** appointed manager of the control engineering department, according to a recent announcement by Vice-President Rugg. Mr. James, a native of Baltimore and a graduate of the University of Pennsylvania, has been continuously associated with the Westinghouse company since 1904. He has been president of the Engineering Society of Western Pennsylvania, chairman of the subcommittee of the Electric Safety Conference and chairman of the control section of the Electric Power Club and is an original Fellow of the American Institute of Electrical Engineers. Mr. Newill, a native of Atlanta, Ga., has been with the Westinghouse company since 1915. He is a graduate of the Georgia Institute of Technology.

Sullivan Machinery Company, Chicago, Ill., announces that it will occupy booths 122 and 123 at the Railway Appliance Exhibition in the Coliseum, Chicago, March 7 to 10 inclusive. Equipment to be exhibited will include portable and stationary air compressors; an operating model of the Sullivan air lift pump; one-man hammer drills; pneumatic concrete breakers; clay spaders; and a portable Turbinair hoist. The company will be represented by Joseph H. Brown, sales manager, Chicago; R. W. Scott and George Rowen, Chicago sales department; and by John Oliphant, manager pneumatic pumping department.

Metal, Coal and Material Prices

Metals—New York	Mar. 1, 1927
Copper, electrolytic, cents per lb	13.15
Copper wire, cents per lb	15.25
Lead, cents per lb	7.55
Zinc, cents per lb	7.16
Tin, Straits, cents per lb	69.55
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.625
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	2.175
Central. Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.50
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.72

W. C. Stettinius, president of the American Hammered Piston Ring Company, Baltimore, Md., has been appointed a member of the merchandising committee of the Automotive Equipment Association, filling the vacancy caused by the resignation of T. H. Quinn of the National Lamp Works of the General Electric Company. Mr. Stettinius at the present time is president of the N.S.P.A., having been elected to that office at the association's meeting last November, and has also in the past served on the service parts committee of the A.E.A.

New Advertising Literature

Charles Cory & Son, Inc., 183 Varick Street, New York City, are now distributing their new bulletin, No. 60-29-A, describing annunciators, bells, button and signal equipment. The bulletin contains 60 pages of descriptive text, 117 illustrations, alphabetical, numerical and thumb indexes.

Ohio Brass Company, Mansfield, Ohio, has recently issued a folder describing its Form 4 trolley base. Outstanding features of construction, as claimed by the manufacturer, are: The use of hardened steel bushings on the hinged fork which pivots with the vertical movement of the trolley pole; the use of forged steel eyes within closed-in end tension springs; use of renewable bearing spools on the lower ends of the tension springs, where they are anchored to the turret arm studs; and the use of a long trolley pole supporting clamp.

United States Rubber Company is issuing a facsimile of *World's Work* magazine, in which is reprinted "The Story of Rubber," whicn appeared in that magazine for January, 1927.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is mailing out a folder describing its industrial electric furnaces. The folder includes specifications on the type H box furnace, type O lead and salt baths, and type J lead and salt pots.

Wiswell Improved Railroad Crossing Company, Chicago, Ill., is issuing a circular letter descriptive of its noiseless crossings, to which is attached a testimonial letter from W. L. Roller, engineer of maintenance of way Hocking Valley Railway Company, Columbus, Ohio.

Mack Trucks, Inc., New York, N. Y., has just issued an elaborate poster illustrating the effect of torque or twisting efforts upon crankshafts of different diameters.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, March 12, 1927 *Number* 11

Attempt to Return to Home Rule Fails

LEGISLATION inimical to the best interests of the railways of Minnesota, and in the last analysis inimical to the best interests of the citizens there, apparently has failed. By a vote of 41 to 23 a committee has recommended an indefinite postponement of the bill to repeal the Brooks-Coleman law, which placed the regulation of electric railways in the hands of the State Railroad and Warehouse Commission. Senators Henry Morin and Charles Hausler, authors of the repeal bill, contended that the law had failed to work as promised and had been unfair to the people of the city. Senator Sullivan, defending the committee report, said that the 1921 Legislature passed the law because it realized that the railways in the large cities were being made political footballs. The chambers of commerce in the three interested cities opposed the repeal of the act. Quite naturally the railways were concerned. The position they took was made plain in the article in the JOURNAL for March 5, in which comment was made to the effect that the repeal of the state regulatory act was not a prospect which the people of the Twin Cities could contemplate with equanimity. They really stood to lose more than did the railways.

Since the legislation has failed this comment may seem like a case of much ado about nothing, but that is not really so. Administration of regulation in Minnesota appears to have been beyond suspicion. Attempts made there and elsewhere to undo the work of the past in building up regulatory structures that are essentially sound are persistent. Perhaps in some cases fault does lie in commission personnel or some phase of commission administration, but that is no reason for upsetting a plan which, by and large, has proved itself effective and in the best interests of all concerned.

Where Unification of Transport Facilities Sometimes Strikes a Snag

LITTLE things often influence a man's opinion more than do those of greater importance. This is particularly true of his ideas on public utility management. Months of dependable service are forgotten because of irritation over small shortcomings. Trifles rather than the actual merits of the situation are likely to determine his attitude toward the company. An evidence of such reaction sometimes is found in public opposition to the placing of all local transportation facilities under the control of a single management.

An important aspect that may have a great influence is the dehumanizing process that frequently follows the absorption of a small independent operator by a large transportation corporation. The individuality of employees is lost. Old familiar faces disappear. Mere numbers replace names. The patron becomes simply a passenger instead of being a friend of the company. New rules promulgated by some far-away office govern operation. "Step lively" is the slogan instead of the former "good morning." The rider cares not that the efficiency of transportation has been increased. For him a mechanical process has replaced a friendly journey.

To any one who has carefully studied this matter the advantages of unification seem self-evident and outweigh the minor disadvantages. The quantity and quality of transportation service must be adjusted to the traffic requirements. Only when the street car, the bus and the taxicab are rendering the service for which each is best suited will community transportation be on a sound basis. Obviously, this cannot be done when these various facilities are under separate managements.

If the human element is lost to sight in the change of management, the loss reflects chiefly the desire on the part of the company to supply a quick and efficient service. On every hand transportation companies are trying to establish friendly personal relations with their patrons. It is well that constant vigilance be exercised to this end, so that important unification plans of the future will find public opinion favorable.

Getting Down to Brass Tacks in Production Practices

NO MOVEMENT in American industry deserves higher commendation or support than the one that seeks simplified practice in production. Born in the hectic days of the World War, it has gained tremendous impetus due to co-operation between the Department of Commerce, producers, distributors and consumers. Elsewhere in this issue of the JOURNAL is a review of a primer just released by the Department of Commerce which not only outlines the results of six years intensive study in eliminating a needless variety of sizes, dimensions and types of commonplace articles, but reveals the enormous savings effected. From milk bottles to structural steel it is one splendid story of what common sense and co-ordinated effort can accomplish. Estimates of savings in money by some of the industries now producing on the simplified practice plan recorded in the primer are: Paving brick, $1,000,000; sheet steel, $2,400,000; steel reinforcing bars, $4,500,000; warehouse forms, $5,000,000; inquiry, purchase, order, and invoice forms, $15,000,000; and lumber, $200,000,000. These figures are proof that much so-called individuality in production in the past was superficial and useless, and further that odd sizes gave the producer no competitive advantage. As the primer points out, "the passing of this misconception has led to a point where today industries as a whole are very generally competing with other industries through simplification to broaden markets and induce the widest possible consumption of their respective products.

Perhaps one of the most gratifying aspects of the movement is that it has gained world-wide recognition, so that industrial experts, writers and others from foreign countries are urging their industries to follow the example of the American producers. Abroad the approach is for a reduction of variety through standardization rather than simplified practice. "In Anglo-Saxon countries," the primer states, "the relatively greater weight is put on specifications. In continental Europe emphasis is put on dimensional standards. Germany now has more than 1,000 approved standards, while Austria, Switzerland, Holland, Czechoslovakia and Sweden are working along dimensional standardization." All of this is a healthy indication that eventually our friends across the sea will come to simplified practices as the ultimate solution.

When considered from the standpoint of the electric railway field, the movement for simplified practices in production is one that should demand co-operation from every purchasing agent and manufacturer. Already there is sufficient evidence of what economies have resulted from co-operation in determining the essentials and non-competitive items that affect the needs of the industry. Nothing but good has resulted from such co-operation, and as the primer reminds us, elimination of the non-essentials and the false efforts toward individuality "still leaves room for the development of individuality." Every new friend of the movement will be reflected by decreasing production costs, greater efficiency and a broader conception of what is meant by getting down to brass tacks in production practices.

The Spirit Must Be Backed by Knowledge

MUCH has been said and written about the consequences of the car operator's dealings with the public. Discussion of the importance of courtesy and of the need for transportation salesmanship have occupied a prominent place in the councils of the industry and have been considered among its most important immediate objectives.

It may well be said that the success of public transportation depends on the attitude taken by employees in their contact with their riders. The spirit is the thing. That is the first and indispensable requirement. A disgruntled or a grouchy employee is the very antithesis of a salesman. Loyalty, interest, cheerfulness and courtesy constitute the big four of personality upon which the industry must build. With these factors anything is possible; without them failure is a foregone conclusion.

Consequently the industry has been wisely concentrating on the job of building up and improving the attitude of both management and employees toward the public. But something more is required. There is the need for knowledge and training. It is probably safe to say that every day, on every car, there arise public relations problems that require expertness in their handling. Without proper training the average man finds himself faced many times with situations in which the best of intentions may prove of no avail.

The transportation salesman must be trained for his work. He must know in advance the best method of handling a specific problem which arises in his dealings with the public. The principles and methods to be used are not established. Their determination is a job for experts with a peculiar combination of talents. After that, the problem or case method of instruction probably will be most effective in transmitting this to the men on the job. That is to say, the student will be required to handle in the class room definite situations that are set up to duplicate actual experiences gathered by careful surveys of the problems that arise on a car platform. Training of car men may be expected to become much more thorough than at present. The spirit of employees is important, but the activity of a salesman must be backed by knowledge.

Wood Preservation Becomes Increasingly Attractive

MANY times this paper has called attention to the desirability, if not the absolute necessity, of preservative treatment for ties and timber used by electric railways. It has been shown that treated wood lasts from twice to several times as long as wood in its natural state. Furthermore, it has been found possible to substitute cheaper grades of wood, particularly those which are not inherently able to withstand rot, for the so-called hard woods which formerly were used almost to the exclusion of others for ties and structural timbers.

In the past, most of the activity in wood preservation has been by the steam railroads. Though the A.E.R.E.A. wood preservation committee has done excellent work in showing the value of treatment, for some reason electric railway men have not taken kindly to the use of preservatives, and at times have attempted to prove that the cost of treatment offsets the gain in life and in ability to use the cheaper grades of wood. It also has been argued that treated wood is hard to handle. If complete refutation of statements of this character were needed, it is found in the article by C. A. Smith published in this issue. The Georgia Railway & Power Company, with which he is connected, was a pioneer in the use of treated timber, having begun it in 1895. Results have been so satisfactory that the company has extended the use of the process very greatly.

Proof of the value of treatment is seen in the cost figures presented by Mr. Smith. Savings as high as $290 per mile of open track have been made. Where the track is beneath paving, much depends on the type of pavement and the length of time it can go without being ripped up. Savings of $528 to $1,188 per track-mile have been obtained with creosoted ties in paving.

Proportionately, for ties the saving runs from 26 to 30 per cent of the cost for non-treated wood. For timber the saving shown is 17 per cent, while for poles it is as high as 52 per cent. This large economy is in part due to the use of a relatively cheap pine instead of chestnut, although the life of the treated pine pole is 22 years, against five years for untreated chestnut.

With such figures before him, it is difficult to see how an engineer can fail to appreciate the money value of preservative treatment. If unsatisfactory results have been obtained in the past it may have been due to wrong methods of treatment, and further investigation should be made to ascertain the reason for poor success. Incidentally, the supply of first grade timber is being exhausted at a rate so rapid that present costs are not likely to obtain for any considerable time. With all grades of timber becoming increasingly expensive, the value of preservative treatment is becoming greater at an accelerated rate.

"Look Here, upon This Picture, and on This"

PUBLIC debt today is much in the same position of a man taking one step forward and then slipping back two. A few statistics illustrate the point: From Jan. 1, 1920, to Jan. 1, 1926, the national debt was reduced about $4,250,000,000. During the same period state and local government debts increased about $6,750,000,000. Between these same dates expenditures of the national government were reduced about $2,000,000,000 a year, while on the other hand current expenditures by state and local governments increased more than $2,000,000,000 a year, and are still increasing—almost a clear case of inertia as regards removing the burden of taxation. And further, while the national debt is being reduced about $750,000,000 a year, state and local government debts are on the increase at the rate of more than $1,250,000,000 every twelve months.

Taking the same five years as a base it is revealed that state governments contracted new debts about twenty times as fast as they paid off old debts, and that the orgies in state and local government debt were being indulged in at a pace 4¼ times as fast as was the case before the war. And to cap the climax, the amount of state and municipal bonds sold during the past 25 years has risen from $131,549,300 in 1901 to $1,399,637,900 in 1925.

Top this off with the fact that the total public debt of all form of governments in this country is higher now than when our war debt was at its peak in 1919, and it is child's play to envisage the enormous sieve into which is being poured the people's money, to say nothing of that squeezed from public utilities and the manufacturers.

Examine this sieve closer and it is discovered that some of the big holes are formed by 40 per cent of national expenditures, 20 per cent of local expenditures and about 10 per cent of state expenditures being required to pay interest and to amortize existing public debt.

As Hamlet advises: "Look here, upon this picture, and on this," then decide who is the garroter that is strangling the life out of not only those who struggle to furnish adequate local and national transportation, those who manufacture what is vital to transportation, but those from whom public utilities receive their revenues. It is a tremendous problem, which can be solved only by a national movement. Those who sit in the council chambers, and those who dance while they fiddle, must be impressed with the truism that when transportation is strangled the heart of commerce ceases to beat.

Cincinnati Has a Problem in Co-ordination

OVEREMPHASIS should not be placed on the vote of residents of Mount Lookout, a residential section of Cincinnati, Ohio, to refuse the offer of a four-month trial of motor coach service to replace electric railway service, but the vote is not without its significance, particularly since this is the second time a similar proposal has been rejected. These two instances would seem to bear out the theory of R. N. Graham, also based on experience, that any choice between the two vehicles on the part of the passenger is simply one of greater convenience. But more important than this is the concern that the losses on its buses is causing the Cincinnati Street Railway. Particularly interesting is President Draper's answer to the question, why the motor coach operation of the company loses money when independent companies apparently made a profit.

The remedy suggested does not include discontinuance of any coach lines at this time. The ultimate object is so to fit the coaches into the service that they may be run to the best advantage. This is in line with the ideas of Mr. Draper that there is a place in a unified transportation system for all forms of transportation that can demonstrate their lasting qualities. Mr. Draper says that being charged with the responsibility and obligation of providing unified transportation, the company cannot neglect to adopt any reasonable form of transportation that the public desires and is willing to pay for. It is merely seeking to find out how best to attain its objective. The proposals advanced by Mr. Draper, outlined elsewhere in this issue, are of more than local interest in Cincinnati in that they represent to a considerable extent the objects sought by the industry as a whole in its efforts to co-ordinate service at a reasonable fare in a way least burdensome to the company and to the best advantage of the public.

Review of the Past Gives Hope for the Future

RETROSPECTION is good in that it makes the individual or the industry pause for a moment to take stock after a review of the past. That is what Lucius S. Storrs, managing director of the American Electric Railway Association, did in his address this week before the Oklahoma Utilities Association. His review of the past ten years of transportation history portrays vividly the worst period the industry ever has seen. Due largely to lack of understanding and failure to appreciate the situation, both by the operators and by their customers, the public, the electric railway industry all but collapsed under the combination of burdens thus heaped on it.

It is greatly to the credit of those men influential in the financial life of the properties that they had the vision to see that local transportation is essential to community growth and the courage to carry on despite every sort of discouragement. As Mr. Storrs pointed out, they are investing their own money and the millions of their stockholders in local transportation enterprises, confident that there is a demand for local common carrier transportation and that, having learned its lesson, adverse conditions similar to those of the past few years will not recur in the future.

While it is agreed that there always will be a demand for community transportation service, and that it can best be supplied with a co-ordinated electric car and bus system, there is still much work to be done. Heed should be taken of Mr. Storrs' statement that the bus problem has not yet been solved. The bus has proved a very efficient tool for certain phases of transportation, but it has been demonstrated also that it cannot effectively do the work that has been performed so well by the street car. The problem is being worked out, but it will require the careful attention of transportation men for some time to come if the most satisfactory solution is to be reached.

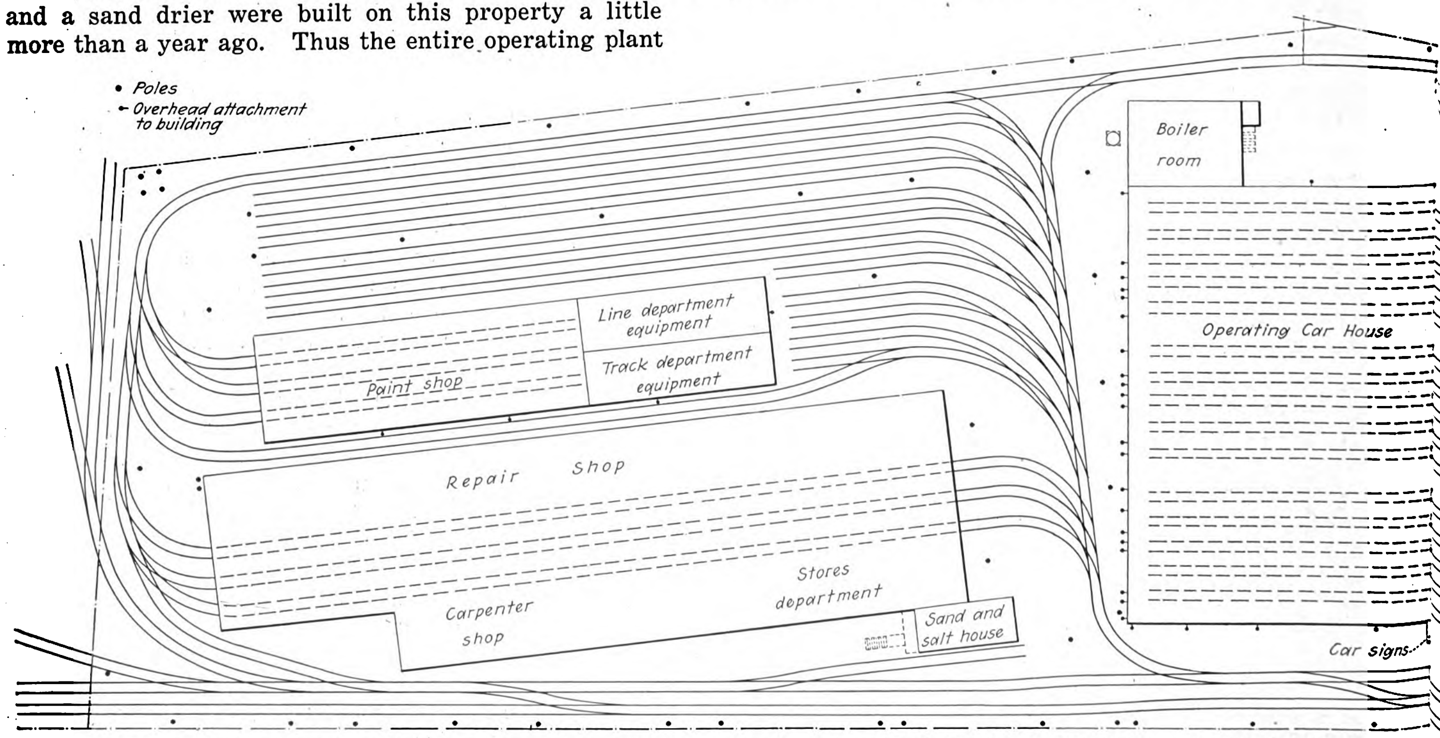
Extensive Improvements

Made at Waterbury

Connecticut Company Has Spent More than $600,000 in Construction of New Administration Building, Operating Carhouse, Sand Drier, Steam Heating Plant and Yard Track Layout

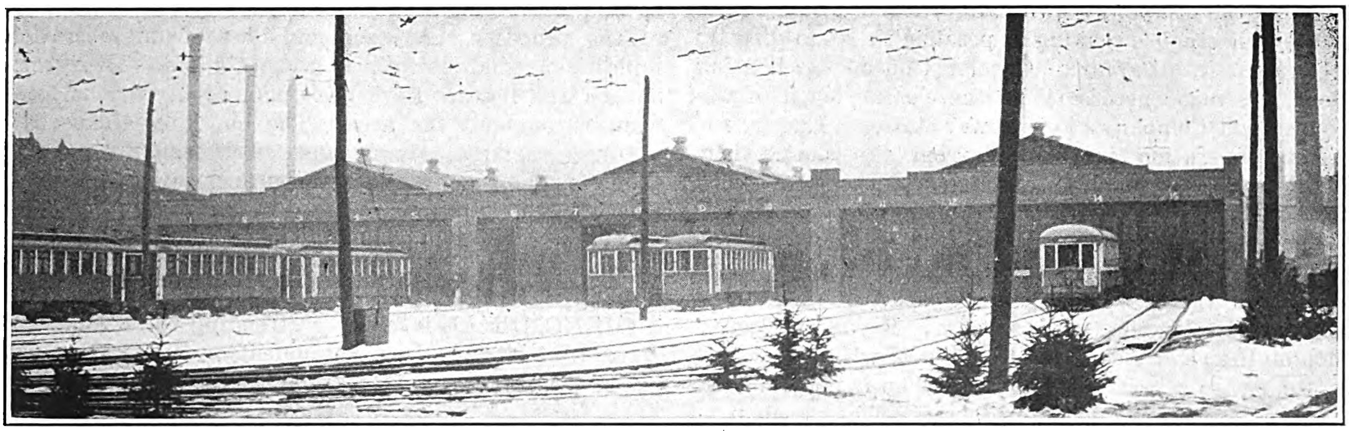
SINCE the completion last fall of extensive improvements to the property of the Connecticut Company bordering the Naugatuck River at Waterbury, this railway has had one of the most up-to-date car operating and maintenance plants in the country. The principal elements in this development are a new administration building accommodating all the local offices of the division, a new operating and inspection carhouse, and a central steam heating plant. A paint shop and a sand drier were built on this property a little more than a year ago. Thus the entire operating plant is new. Altogether more than $600,000 has been spent by the company in making these improvements.

Prior to this development, facilities at this location, excepting the general repair and overhauling shop, were antiquated and unsatisfactory. The administrative offices were housed in a two-story wooden building erected during the war to accommodate trainmen recruited in other cities who came to Waterbury and found it difficult to secure lodgings. This structure,



• Poles
← Overhead attachment to building
Boiler room
Line department equipment
Track department equipment
Paint shop
Repair Shop
Operating Car House
Carpenter shop
Stores department
Sand and salt house
Car signs

Improvements on Connecticut Company Property in Waterbury Include a New Administration Building, Operating Carhouse, Steam Hea



Three Bays of Five Tracks Each Accommodate a Total of 55 Cars Under Cover in the New Operating Carhouse at Waterbury

however, was ill-suited for use as an office building and was inconveniently located across the river from the operating headquarters. A shed of wood and corrugated iron, known familiarly as the "tin barn," and three other dilapidated structures constituted the only shelter provided for the rolling stock which was not in the overhauling shop. Plans had been under consideration for a long time to improve the car storage, operating and office facilities of this division, but their execution was postponed for various reasons. In 1924 the paint shop and sand drier were built, and last year the improvement was practically completed.

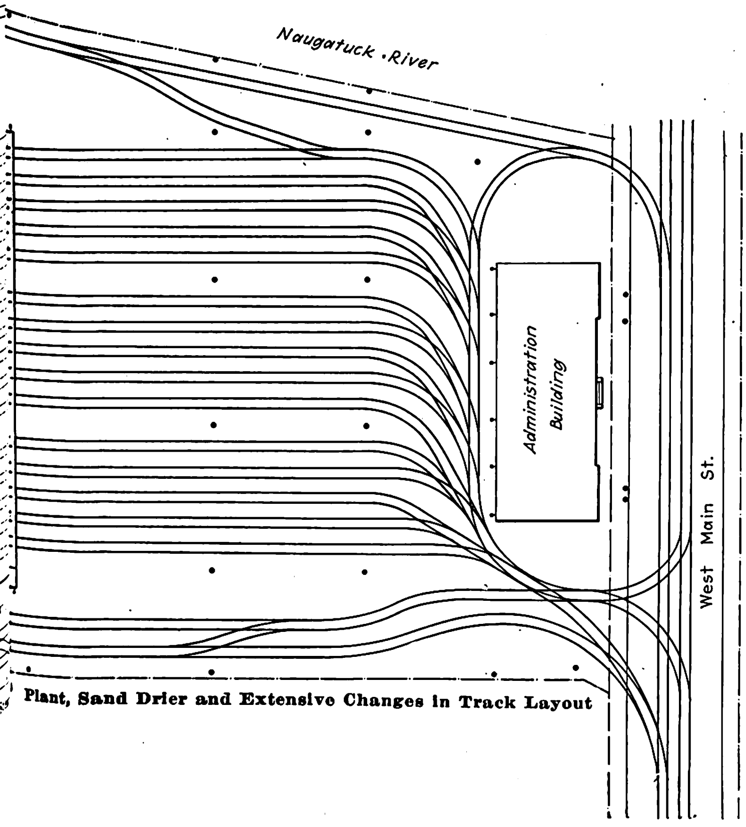
By itself, the Waterbury division of the Connecticut Company constitutes a good-sized local transportation system. Rail lines total approximately 85 miles of single track. In winter 95 passenger cars are operated. In summer this division has assigned to it some 30 additional open cars that are stored elsewhere under cover during the seasons when they are not in use. Bus operations require a total of 22 vehicles. The operating personnel consists of 150 trainmen, 20 bus drivers and eighteen inspectors and starters. The relatively large number of inspectors and starters is accounted for by the heavy rush-hour traffic characteristic of this industrial city. From the foregoing it will be seen that extensive facilities are required for car storage and inspection, as well as for operating and administrative offices.

Approaching the property from the center of town, one sees first the new administration building, fronting on West Main Street. Constructed of red brick and concrete colored to resemble Georgia marble, this building presents a simple and businesslike appearance. On the second floor are housed the offices of the division manager, the superintendent of transportation, the timekeeper, the dispatcher and the local officials of the claims, track and line departments. On the first floor are the office of the receiver, a trainmen's room, a locker room and a room for inspectors and starters. A school of instruction is located in the basement. This is equipped with the usual control and fare registering apparatus as well as with signal apparatus, because in the Waterbury division there is considerable single-track mileage protected by automatic signals.

Behind the administration building is an open storage yard with fifteen tracks. These tracks terminate in the new operating and inspection carhouse, which has three bays of five tracks each. Its walls are of red brick. The roof is of steel truss construction, supporting slabs of gypsum, making the structure thoroughly fireproof. Numerous glass skylights render the interior bright and cheerful. The general floor level in two sections is about 4 ft. 6 in. below ground, while the rails are supported on reinforced concrete columns spaced 5 ft. apart, as shown in an accompanying illustration. Between the tracks reinforced concrete flooring is provided, but the space between the two rails forming each track has been left open to facilitate inspection of equipment underneath the car. The construction of the building in this way was comparatively simple because it is located on filled land. The other or westerly section is not filled.

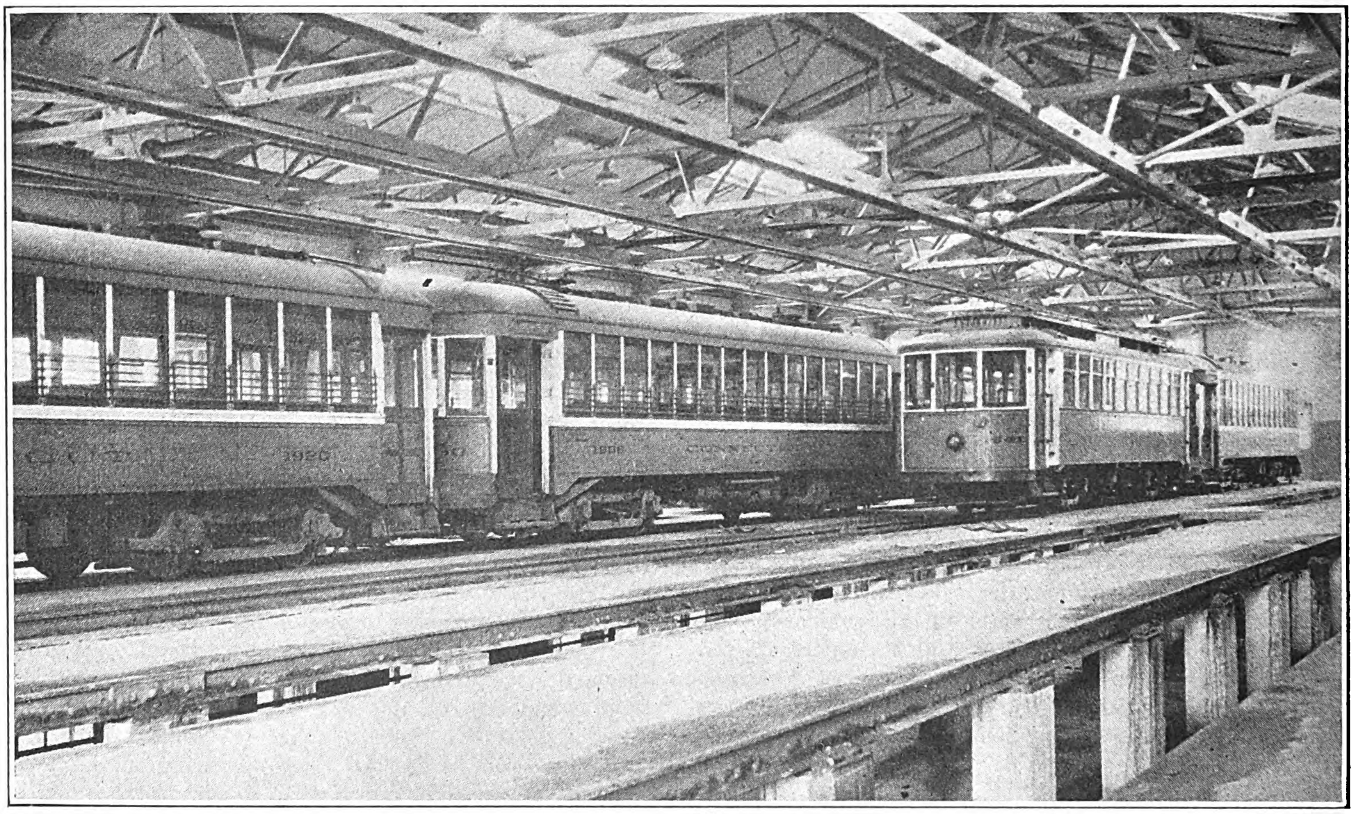
At present the capacity of this building is 55 cars, and it is planned to extend it in the direction of the administration building. Ample room exists in front of the present structure where there is now a car storage yard to build an extension equal in size to the part already completed. The overhaul and paint shops have capacity for a considerable number of additional cars, but these facilities are not used for ordinary night storage.

Alongside the operating carhouse a steam heating plant has been built. From this point steam is sent to all buildings on the property. Coal is brought to the



Plant, Sand Drier and Extensive Changes in Track Layout plant by the company's own cars, a track passing close to the boiler house making it possible to dump directly from a car into the bins. Construction of this heating plant was made necessary by the closing down of the Connecticut Company's local power station. Energy for railway operation is secured from the Connecticut Light & Power Company through a substation owned by the latter.

Behind the carhouse are the repair shop and the paint shop, housed in separate buildings. Each of these shops has three tracks, while a service track runs through between the two structures. Beyond the paint shop on the river side is a storage yard with six tracks. As the entire capacity of the paint shop is not required at this time for car painting, a section has been partitioned off for storage of equipment belonging to the line and track departments.



In the Operating Carhouse the General Floor Level Is 4 Ft. 6 In. Below Ground, with the Rails Supported on Reinforced Concrete Columns. The Space Between the Two Rails of Each Track Is Left Open to Facilitate Inspection of Running Gear of Cars

At one corner of the car overhaul shop a sand drying plant has been built. This is of unusual size on account of the hilly territory served by the lines of the Waterbury division and consequently large use of sand. Several unusual features have been embodied in its design. These will be dealt with in another article to appear in a future issue of ELECTRIC RAILWAY JOURNAL.

BUS GARAGE PROVIDES FOR ORDINARY MAINTENANCE WORK

To accommodate the 22 buses now operated as part of the local transportation system, a section of the trolley express building on this property has been converted into a garage. Facilities for ordinary maintenance work have been provided. Heavy overhauling of buses, however, is done at the company's New Haven garage. The remainder of this building is still used for trolley express purposes.

Particular attention has been paid in the execution of this improvement program to the general appearance of the property. At each end of the administration building a small lawn has been laid out. Evergreen shrubs and flowers have been planted in various locations throughout the area. The buildings themselves are necessarily of simple and substantial design, but their neat and businesslike appearance gives a pleasing aspect to the property.

Farm Demonstrations via Interurban

PHENOMENAL interest is attending the demonstration of electric farm equipment on board the farm electric railway car fitted out by Purdue University agricultural extension department in co-operation with the Indiana electric companies and interurban lines. The car is now making a tour over all the electric lines of Indiana. Farmers along the line interested in studying the costs and production possibilities of electricity on the farm will have an opportunity to inspect the car en route.

Truman E. Hienton of the agricultural engineering staff, who is in charge of the car, broadcast on the radio recently, telling of the purposes of the tour. The car is equipped with a model farm kitchen. Electrical appliances on board include milking machines, cream separators, poultry house lighting systems designed to increase egg production, ensilage cutter, feed grinder, incubator, fanning mill, water supply system, cider press, wood saw, churn and grindstone.

Officials of the university predict that many thousands of farmers will have seen the car before the tour is ended. Interest during the first few days of the tour was acute and those in charge were kept busy with explanations of costs and like information.

Transportation Winning Hardest Business Battle in History

By Lucius S. Storrs

Managing Director American Electric Railway Association,
New York City

Lucius S. Storrs

IN AN ADDRESS before the Oklahoma Utilities Association at Oklahoma City on March 9 Mr. Storrs presented an unusually strong plea for co-operation on the part of all utilities and portrayed in vivid manner the momentous economic struggle from which the industry is emerging head up and shoulders back. Every transportation executive will get new inspiration from this abstract of Mr. Storrs' thinking.

PROGRESS and prosperity of all utilities are closely identified with the growth of the communities. Just as cities go forward so do the utilities serving them grow and prosper. It behooves us for selfish reasons, if for no other, to do everything within our power to encourage and help them. Thus it becomes apparent that there is need for all of us to work together, shoulder to shoulder. We should extend our services jointly, have a common interest in seeing that all of us render the best possible service and obtain a square deal from public officials and the public generally.

I know that all of you will be pleased to hear that the industry is on a better basis than it has been at any time in many years and that there is no great problem before us today which does not seem possible of solution, provided we have the united support of all the branches of the utility business.

Not a little of this advance has been due to co-operation. Local transportation men are joining hands with other utility men in carrying out the plans of state committees on public utility information, state associations, sectional associations and, finally, national associations.

Initially, I want to impress upon you that the local transportation industry is not decadent. If you have been led to believe that its funeral is imminent, put that thought out of your mind now. It is not true.

In urban centers, particularly, there never has been greater need for high-class local transportation both by electric cars and buses than there is today. It has been proved conclusively that the bus is not going to replace the electric car in mass transportation, that private automobiles cannot furnish all of the required service and that co-ordinated electric railway and bus service under single managements is the logical solution of the local transportation problem. Electric railway men are going forward throughout the country to supply this great public requirement.

The industry is emerging from its ten or more years of reverses more physically fit, with a broader vision and with an increased appreciation of its opportunities, just as the United States emerged from the great World War a stronger nation. Today, instead of being a decrepit plant waiting for the undertakers to carry it away to the boneyard, the electric railway industry is charged with new energy and is more capable of rendering good service and more determined to render it well than it has been at any time in the last fifteen years. Out of ten years of discouragements, marked by rising costs, bus competition and many other reverses, the industry is emerging head up and shoulders back, working with keen mind and willing hands and going forward to a constructive and profitable future.

You have heard much of abandonments of electric railway mileage, so I want to set you right on that situation. Despite private automobile and bus competition, the total electric railway mileage in the United States today is only 4 per cent less that it was at the peak record for all time in 1917. And virtually all of these abandonments have been in towns of from 8,000 to 25,000 persons, or in rural sections where not one foot of the track ever should have been laid. The pioneer builders made two serious mistakes that have exerted a great influence on the industry during the recent years. First, they built many lines without regard to the traffic demands, and, second, they tried to operate them on a fixed 5-cent fare in cities and a much lower fare than steam lines in rural sections. Not one property in a city of 50,000 or over ever has been permanently abandoned. Those are the facts about electric railway abandonments in this country, and they supply a most eloquent answer to the assertion that the electric railway is doomed.

The cost of producing rides varies in different communities and, naturally, the sales price of them also will differ. The public generally, in most cities except New York, now has come to realize this, and practically all communities are willing that fares shall be adjusted with changing costs.

The advent of the European war, with skyrocketing wage and material costs, brought about revolutionary changes. Almost over night the cost of wages and material doubled, but fares were not changed. Service had to be continued, so it was necessary to meet these rising costs and hope that fares would be raised proportionately. Unfortunately, the industry had put in some 30 years educating the public to a fixed 5-cent fare, so it was impossible to change fares rapidly enough to meet rising costs.

For several years fare raises came about very slowly. Coincident with rising costs and almost stationary fares had come jitneys, private automobiles and bus competition. As a result, when President Wilson in 1918 appointed the Federal Electric Railways Commission, composed of representatives of the public, labor, financial houses and electric railways, to investigate the conditions of electric railways throughout the country, about one-sixth of the total mileage of the industry either was bankrupt or in receivers' hands.

The stock-taking by the industry before the commission in 1919 certainly showed a deplorable condition. The fact that the industry has come back to render the excellent service that it does today proves conclusively the essentiality of it and also the measure of the men engaged in it. If the industry had not been an essential one, or if it had been manned by weaklings, it would have passed out under the conditions existing shortly after the close of the European war.

The inquiry resulted, however, in a remarkably constructive report on existing conditions and a series of suggested remedies of a high order. The outstanding declaration was that public transportation by rail cars not only was a necessity but would be for many years to come and that good service could be obtained only by closer co-operation between the public, managements and men. The fixed fare system and independent jitney and bus competition were scored heavily as economically unsound and the need for better public relations, obtainable through frank dealings, stressed.

Mere acceptance of the federal report did not restore the industry to its present improved state. Local transportation men turned back toward home from those Washington hearings to face one of the hardest business battles in history. Included in the program they sought to carry out were creating better public feeling, obtaining equitable fares, eliminating unfair competition, improving service, co-ordinating the rail car and the bus and obtaining a readjustment of their taxes.

PUBLIC FRIENDSHIP BEING WON

The problem of enlisting public support was the initial one approached. Managements which carried their story to the public honestly and showed themselves willing to be friendly soon found a friendly response. The printed word was used widely, executives and employees made speaking campaigns and gradually public understanding began to be created. After a foundation had been laid through an explanation of conditions, the advertising campaigns quickly shifted to salesmanship, and today rides are being merchandised as intensively and as intelligently as are many commodities.

The bus problem is a grave one and it is not entirely solved to date. Although it has been demonstrated that the bus will not supplant the electric car, it also has been proved that the bus has a place in local transportation. It has, for instance, proved a very efficient tool in replacing some small electric railway lines which never should have been built. There is a place for it in new territories until their traffic is so dense that they demand rail lines. Likewise, it is a splendid tool to use in co-ordination with rail lines in cities. Progressive executives are using the bus where it can best serve.

That a bus ride cannot be supplied as cheaply as a street car ride and that buses occupy more street space per passenger than electric cars has been proved conclusively, and these two factors enter very largely into every proposal to supply bus service. Furthermore, although to date the bus has been able to escape regulation and taxation to a far greater degree than the rail car, this, of course, cannot continue indefinitely. It must compete with the rail car on a similar footing, and as the control of service and taxes becomes equalized, the economy of the rail car steadily becomes more apparent and its continued place more assured.

I beg you, however, not to labor under the delusion that electric railway men generally have tried or are trying to save their properties and restore their service to public favor merely by fighting the bus; far from it. They realize that the only way to obtain and retain public favor is to give good service. There is a great demand not only for buses but also for electric car service more nearly approximating automotive rides. To meet this demand the electric railway industry is modernizing its equipment rapidly and, happily, this modernized service—embracing principally lighter, faster and more comfortable cars and smoother roadbed —is increasing business.

ADVISORY COUNCIL BACKING MODERNIZATION MOVEMENT

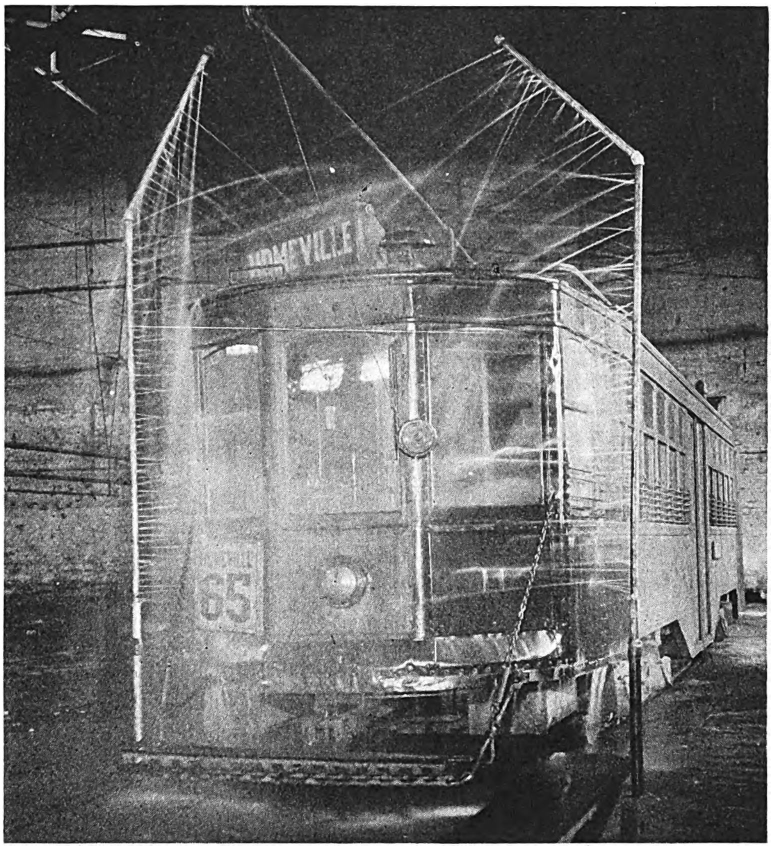
Standing squarely behind this great modernization movement is the Advisory Council of the American Electric Railway Association, formed in 1925. Under the leadership of B. C. Cobb of Hodenpyl, Hardy & Company, this council during the last two years has sought with all its power to convince companies that they must equip their properties with the most comfortable conveyances, both in rail cars and buses, and aggressively seek business. When I tell you that its members are convinced of the future of the local transportation business and are giving much of their valuable time and effort toward advancing its interests, you will realize fully the truth of the statement that it is not a "dead or dying industry." A very large majority of them, too, are investing their own money and the millions of their stockholders in local transportation properties, confident that there is a demand for local common carrier transportation and that soon all of the clouds of uncertainty will be rolled away and it will come into its own again.

As a result of the co-ordination movement more than 7,000 buses are now being operated by approximately 275 electric railway companies over more than 15,000 miles of route. Buses generally are being used in extending transportation routes and little service parallels the main rail lines. Destructive competition is growing less because buses cannot operate profitably at electric railway fares and also because it is no longer possible to purchase efficient buses except upon reasonable financial terms.

That there will always be a demand for common-carrier local transportation admits of no argument. That it can best be supplied with a co-ordinated electric car and bus system has been amply demonstrated. That eventually this service must be paid for in such measure as will give an adequate and fair return to managements and investors cannot be disputed. Accepting these three statements, the future of live progressive local transportation companies seems to be plainly charted. They cannot help but go ahead. It is inevitable. Even though they held back, which they did not, public demand for service would drive them into profitable progress.

Automatic Washing for Pittsburgh Cars

Electrically Controlled Equipment Providing for Rapid Washing Is Being Installed in the Various Carhouses of the Pittsburgh Railways—Details of the First Installation Are Given



Car Entering the Preliminary Wetting Spray by Passing Between Two 1¼-In. Upright Pipes Perforated with $\frac{1}{32}$-In. Holes Spaced 1½ In. Apart. By Staggering the Holes the Water Is Sprayed on the Car in Two Directions

REPEATED efforts have been made by various electric railways to design car-washing equipment which will combine the operations of brushing and washing as the car moves forward and do this mechanically rather than by hand labor. The Pittsburgh Railways has been working out such a process for some time and a preliminary description was published in the Aug. 14, 1926, issue of ELECTRIC RAILWAY JOURNAL. This device has now been perfected to a point where a complete shower bath equipment has been installed at the Craft Avenue carhouse of the company and it is planned to provide twenty additional showers at other carhouses. The equipment has been perfected and manufactured under the direction of John D. Barr, assistant engineer of the Pittsburgh Railways.

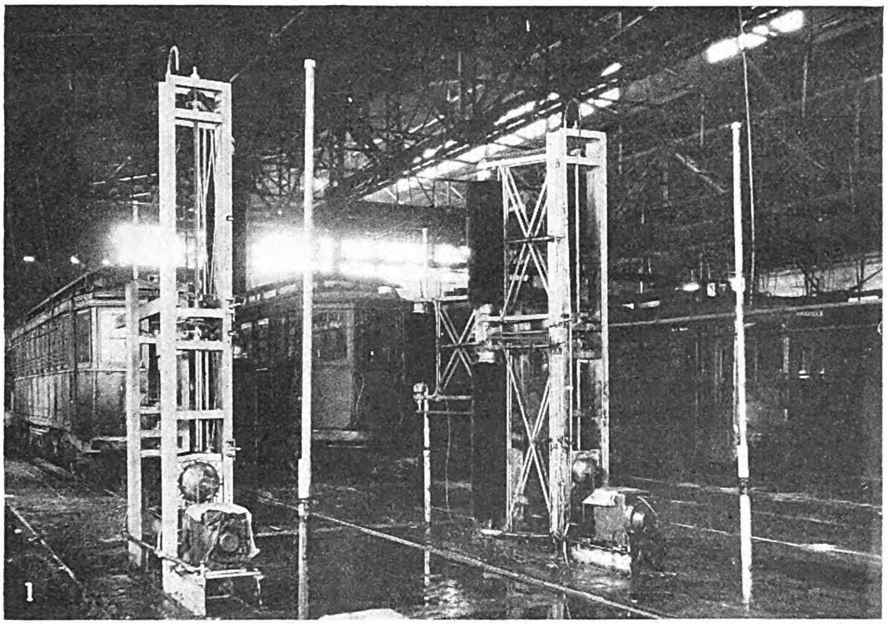
By use of the new equipment a car can be washed, brushed and rinsed in about five minutes, with only two men employed in the process. Compared with previous methods of cleaning used by the railway this is a great reduction, since previously about one hour's time for one man was needed to wash a car. A great advantage also lies in the increased number of cars that can be cleaned quickly between rush-hour periods. The reduction in time enables the entire equipment to be washed more frequently than by old methods, so that cars can be kept on the street in much better appearance, which is one of the essential details for keeping the public pleased.

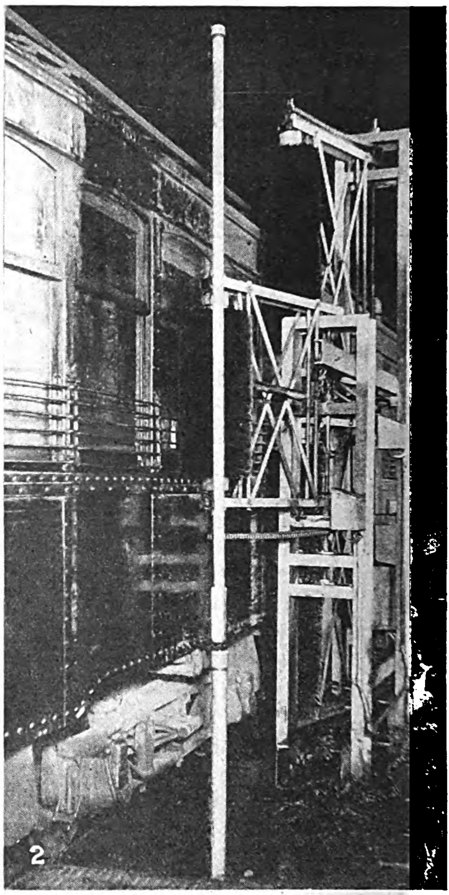
With the new apparatus the car is passed first between two spray arms which throw the water with sufficient force onto the sides, ends and top deck to moisten thoroughly any dirt and wash off a considerable portion of it. The 1¼-in. diameter upright pipes have $\frac{1}{32}$-in. holes spaced 1½ in. apart. The operation of the spray is controlled automatically by circuit breakers which start the flow of water as the front end of the car enters the spray equipment. The water is cut off automatically as the car passes out.

Following the initial wetting one man at each end of the car goes over the ends with a round bristle brush. The brush is 5¾ in. diameter and has a handle 4 ft. long. This scrubbing has been found better than mechanically operated brushes for the ends, as these at present have not been perfected so as to be entirely practicable. With a good type of brush this task can be performed easily without the use of any water additional to that which remains on the car after the initial sprinkling. If necessary a barrel of water can be placed in a convenient position alongside the car washing track for dipping the brush.

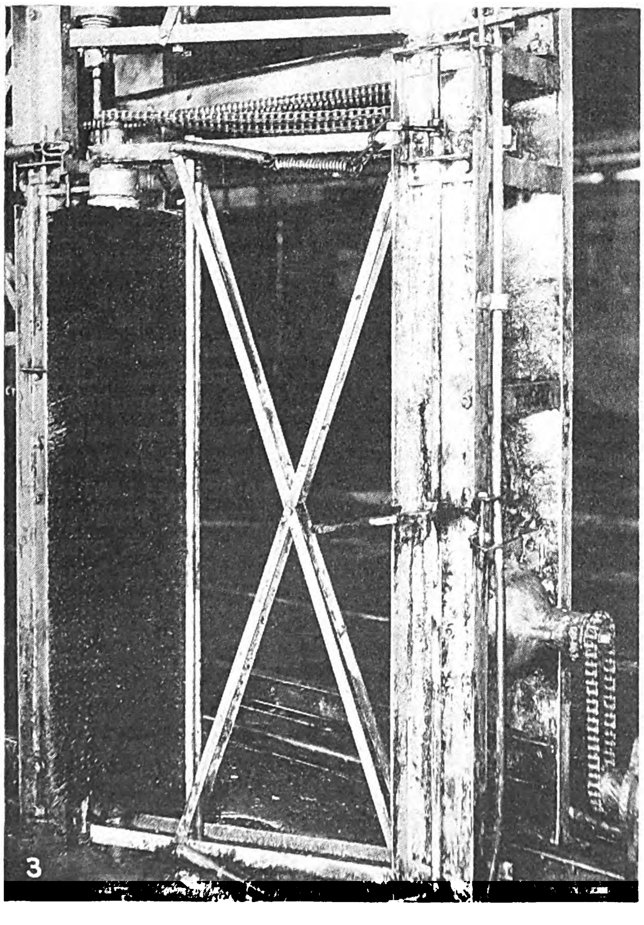
Following the brushing of the ends the car is advanced to the automatic brushing machine, which is equipped with additional spray apparatus. Circuit breakers start both the revolution of the brushes and the action of the spray as the car approaches the machine, and similar equipment shuts off both as soon as the car has passed through. The brushes used were developed by the Wolfe Brush Company, Pittsburgh, Pa., and are made on wooden cores with an over-all brush diameter of 13 in. The assembly of the brushes and also the number of brushes required depend on the profile of the cars that are to be washed. A total brushing length of about 14 ft. is required in Pittsburgh. A single brush of this length has not been found practicable on account of its weight and because one brush will not follow the profile of the car and properly brush all sections.

In the Pittsburgh installation three brushes on each side have been found satisfactory. The length of these varies somewhat according to the type of cars to be washed. The lower brush is a little longer than the flat





Scrubbing and Washing of Cars Are Made Automatic with This Equipment

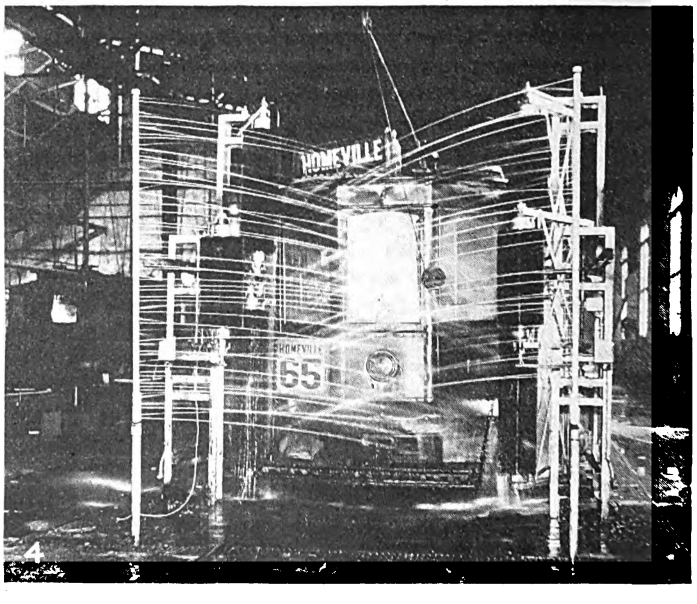


No. 1. View of brushing equipment with two spray arms in the foreground.

No. 2. Brushing the sides as the car passes through.

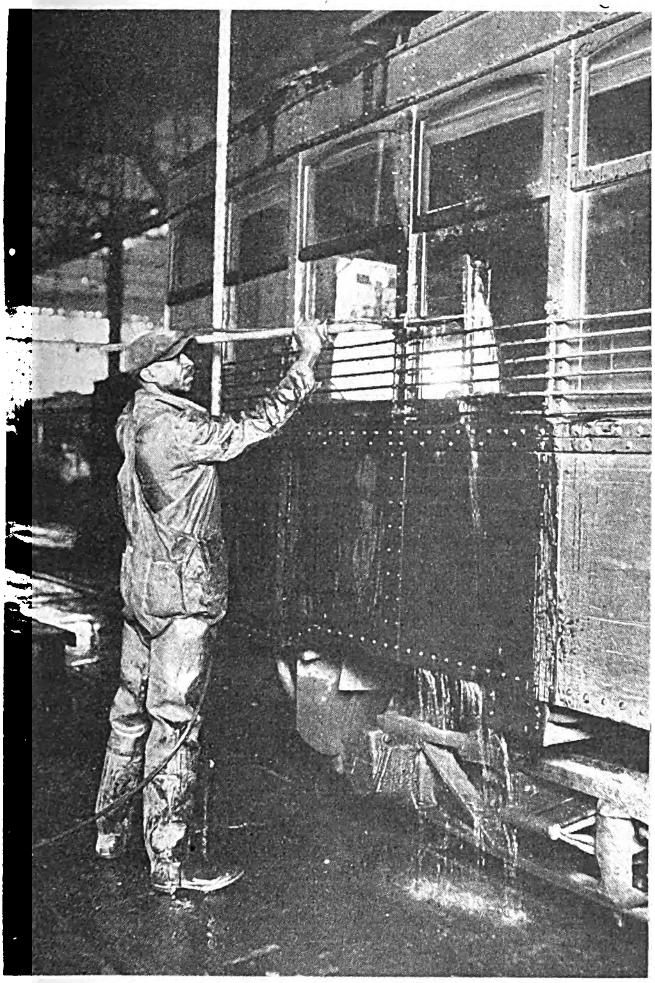
No. 3. Close-up of brush drive to show equipment.

No. 4. Car entering between the brushes with spray in operation.



surface of the car side panel below the windows. The center brush is long enough to brush the window surfaces. The top brush projects farther from the body of the machine than the center one and must not be so long that its action will be hampered by contact with parts of the car which project as far out as the window guards. In Pittsburgh it has been found that to accommodate the various classes of equipment the most convenient axial lengths for the brushes are 60 in. for the bottom, 48 in. for the top and 33 in. for the center brush.

The brushes are placed so as to overlap each other and the whole equipment is designed so that as the car passes between the two sets each brush will be forced against its sides with just enough pressure to give the right brushing effect on the particular part of the surface it is intended to cover. The pressure of the car against the brushes operates the switch of the motor which revolves them. Brush rotation is contrary to the movement of the car and is adjusted at a speed necessary properly to scrub the surface. When pressure is released the brushes cease turning. As the car approaches the brushes it is sprayed first with water and then rinsed in a similar way after the brushes have done the scrubbing.



Method of Using Strip Brush to Clean Window Glass Behind Guard Rails When Rotating Brushes Do Not Remove Mud

The framework of the machine is made of ¼-in. x 8-in. channels and the arms are of light 4-in. channels, braced to make them rigid. A common type of sprocket chain is used throughout the machine for driving. A 5-hp. motor drives the equipment through a bevel gear. Ball bearings are used throughout the machine.

After the scrubbing and rinsing the car is placed for drying. It has been found that the appearance of the car is better than would have resulted had hand operation been used. There is no streaking or smearing with the mechanical method. When washing cars by hand it has been found that the appearance is usually fairly good as long as the water is on the surface, but that hand methods do not give sufficient scrubbing or washing and the result is that streaks and smears are observed as soon as the surface dries.

The hydraulic window washer which is used for washing the window glass back of the guard rails was described in the ELECTRIC RAILWAY JOURNAL, Aug. 14, 1926. This is used only in case the glass has been smeared with mud which cannot be removed thoroughly by the brushes. The hydraulic window washer consists of a thin metal holder 20 in. long which carries a supply of water from a small flexible hose so that it is distributed through the openings with a spraying effect. The strip is equipped with a brush just heavy enough to clean the surface of the glass and thin enough to allow its insertion behind the guard rails. When necessary this operation is performed just after the ends of the car have been washed and before it passes the large brushes. The rinsing of the car will then complete the window washing so that the glass will be perfectly clean. Extra hand cleaning of the window glass has been found desirable in some cases, although it can be dispensed with.

Davenport Tells the World

RADIO broadcasting has a value of unknown extent in reaching new fields. This was brought out when a lay listener hundreds of miles east of Davenport mentioned to the local railway executive that he had heard an interesting talk on electric railway transportation. The clue was followed up, with the result that ELECTRIC RAILWAY JOURNAL is enabled to present the high spots of an address made from radio station WOC by R. J. Smith, vice-president and general manager Clinton, Davenport & Muscatine Railway.

This particular evening had been set aside for a discussion of local industrial and transport problems. Talks were made by representatives of the Rock Island, Milwaukee and Burlington systems on steam railroad subjects, while Mr. Smith talked humorously about the little electric brother who had interchange connections and through rates with them all. He emphasized, in particular, that the electric line by its tie-up with the Chicago & Northwestern helped the other three great trunk carriers in serving the Tri-Cities.

After explaining the nature of the connections and the character of products handled, Mr. Smith presented some data in such a popular way that others may be interested in the text for the sake of doing likewise. Thus:

> In the past twelve months this 70 miles of electric road carried 263,000 passengers and 188,000 tons of freight. In order to do this, the Clinton, Davenport & Muscatine Railway ran just under 1,000,000 car-miles. How does that stack up with the past year's mileage of your Rolls-Royce? We moved 5,664 freight cars; and paid out more than $19,000 in taxes and more than $141,000 in wages. Two million kilowatt-hours of electricity were consumed in this work, or enough to run your washing machine, on the ordinary basis of four shirts a week and other apparel in proportion, about 100,000 years. Our statistician has calcu-

lated that this consumption of electricity would heat my Saturday night bath for 7,915 years.

This railway has been a part of this community since 1903, and although those 23 years have brought about many changes in the way of doing things, and particularly in transportation through the widespread use of the automobile, nevertheless a great need continues to grow for the movement cheaply of passengers and goods 24 hours a day and 365 days a year, regardless of weather conditions.

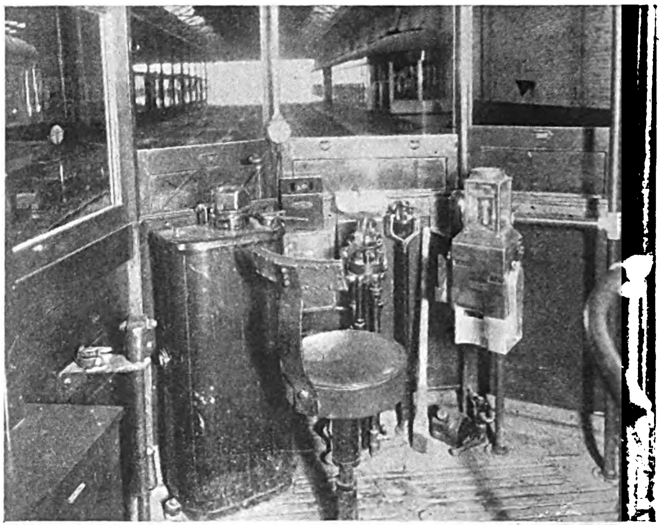
So great is this modern need of transportation of all sorts that each sort is sometimes wrongly chosen. The palatial flier of the trunk line railroad, or that same railroad's enormous coal "drag" of 70 cars; the airplane's flight; the interurban and street car; the automobile's flexibility; the ocean, lake or river craft; even the horse and our own feet—yes, our own patient "dogs" that in this modern age have almost forgotten how to walk—all have their proper place in the transport system.

That place must be determined by each individual for his own special need. And in determining it, cost and reliability must always be considered. For low cost and dependability the railroads are, more than ever before, this country's bulwark of transportation. The Clinton, Davenport & Muscatine Railway is proud, indeed, to furnish its small part in this great transportation scheme and to contribute to the further upbuilding of these thriving communities.

Modernization Continues in Memphis

Initial Investment of $475,000 for 32 New De Luxe Cars Followed by an Additional Expenditure of $130,000 for Reconstruction—65 Cars Remodeled for One-Man Operation

STIMULATION of riding and bettering its public relationship led the Memphis Street Railway, Memphis, Tenn., to decide on a program of modernization. The initial step in this program consisted in the purchase of 32 low-level, double-truck, semi-noiseless de luxe cars from the St. Louis Car Company, St. Louis, Mo., at a total cost of $475,000. Details of these new cars, together with the public reaction to their introduction, were given in the Sept. 4, 1926, issue of ELECTRIC RAILWAY JOURNAL.

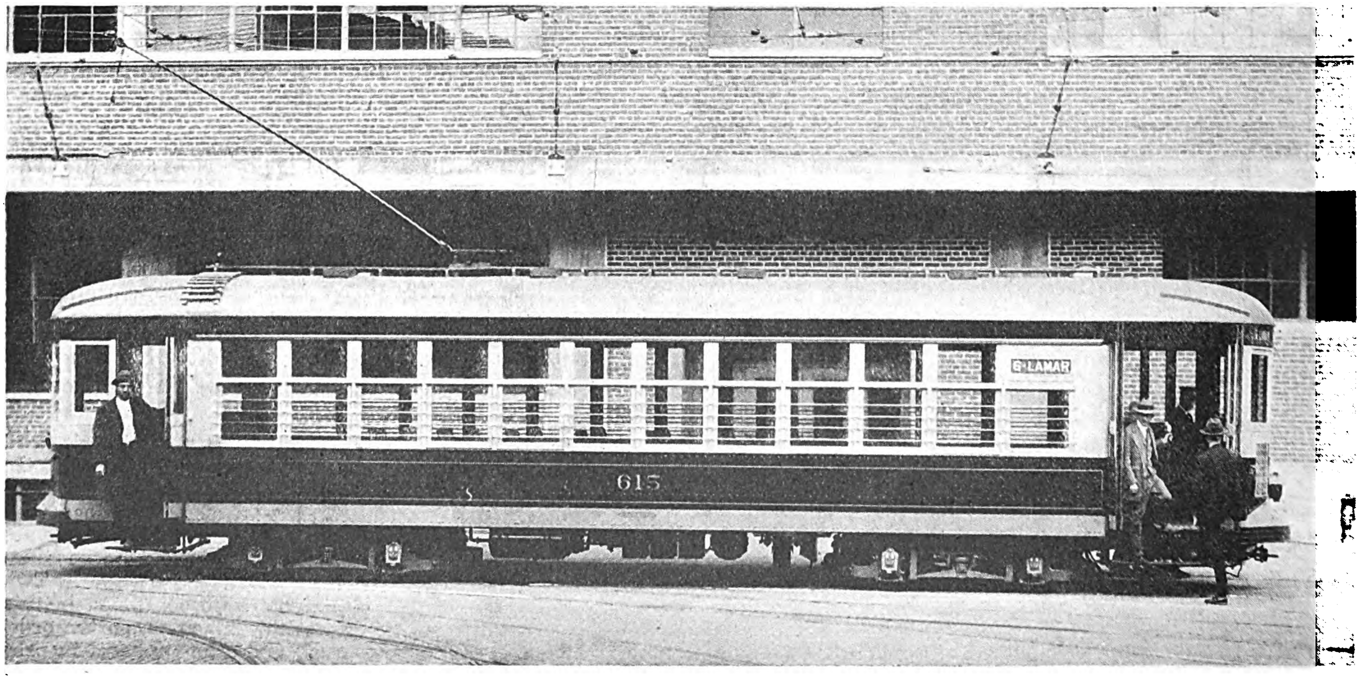


Comfortable Seat for Motorman and the Convenient Location of Controlling Apparatus Are Features in the Reconstructed Cars of the Memphis Street Railway

As they met with such hearty public approval it was decided to go a step further and rebuild 40 of the low-level cars purchased in 1923 to make them suitable for single-end one-man operation. Work was started last October and completed on Jan. 1, at a cost of approximately $80,000. The front platform was redesigned to provide sufficient space for the installation of an entrance and exit door with folding steps. The rear platform was rebuilt with only an exit door. The front and rear exit doors are treadle-operated. All platform apparatus was relocated to permit of unobstructed passenger entrance and exit and convenience of operation. They are now practically duplicates of the 1926 cars with the exception of seats and floor covering. These rebuilt cars were so well received by the public that it encouraged the company to rebuild along the same lines 25 cars purchased in 1914. They were completed about March 1 at a cost of approximately $50,000.

Of the 187 cars owned by the company 97, or about 50 per cent, are designed for single-end, one-man operation.

These cars with their bright color combinations present a very favorable appearance.



One of the 40 Cars of 1923 Type Reconstructed by the Memphis Street Railway. Arch Roof, Excellent Color Combination, Front and Rear Treadle-Operated Doors Present a Fine Appearance and Provide Safety Features

Substantial Economies Obtained by Use of Treated Timber

Georgia Railway & Power Company Has Reduced Cost of Ties by $1,188 Per Year Per Mile of Track—Prior to Installation All Timber Now Receives Preservative Treatment by the Rueping Process

By C. A. Smith

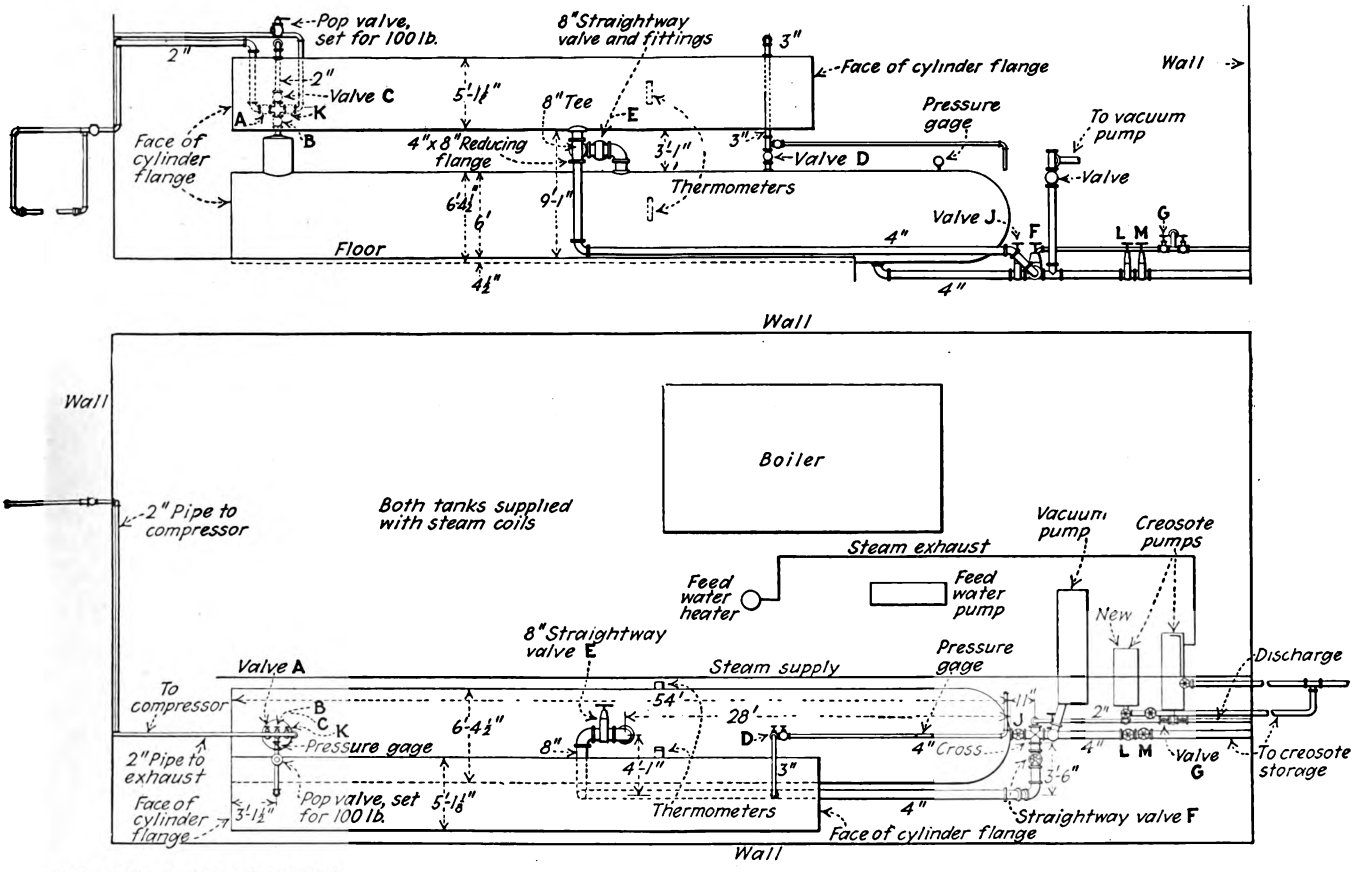
Superintendent of Roadway Georgia Railway & Power Company,
Atlanta, Ga.

MORE than 30 years of experience with preservative treatment of timber by the Georgia Railway & Power Company, Atlanta, Ga., has proved that substantial economies are produced by the practice. This company was one of the pioneers in wood preservation, having begun the use of creosoted timber as far back as 1895. Recently some ties laid in that year were taken up, and a large proportion of them were found to be in good condition. In comparing the costs of treated and untreated ties, however, twenty years is taken as the useful life of a treated tie. At the end of that time it usually is necessary to remove the tie for reasons other than deterioration. Wearing out of the rail or pavement may make it necessary to rebuild the whole track structure, and old ties are removed even when sound. Experience with treated ties shows savings ranging up as high as $1,188 per year per mile of track, as compared with untreated ties.

The original creosoting plant of the Georgia Railway & Power Company had one pressure cylinder 5 ft. in diameter by 40 ft. long with the necessary storage tanks, pumps, etc. It was located close by the power house boiler room from which it took steam, and was constructed in the open with simply a shed for shelter. The full cell pressure process was used, as creosote at that time was very cheap, costing around 6 cents per gallon. Timber was impregnated by this process with a retention of from 10 to 14 lb. per cubic foot of timber.

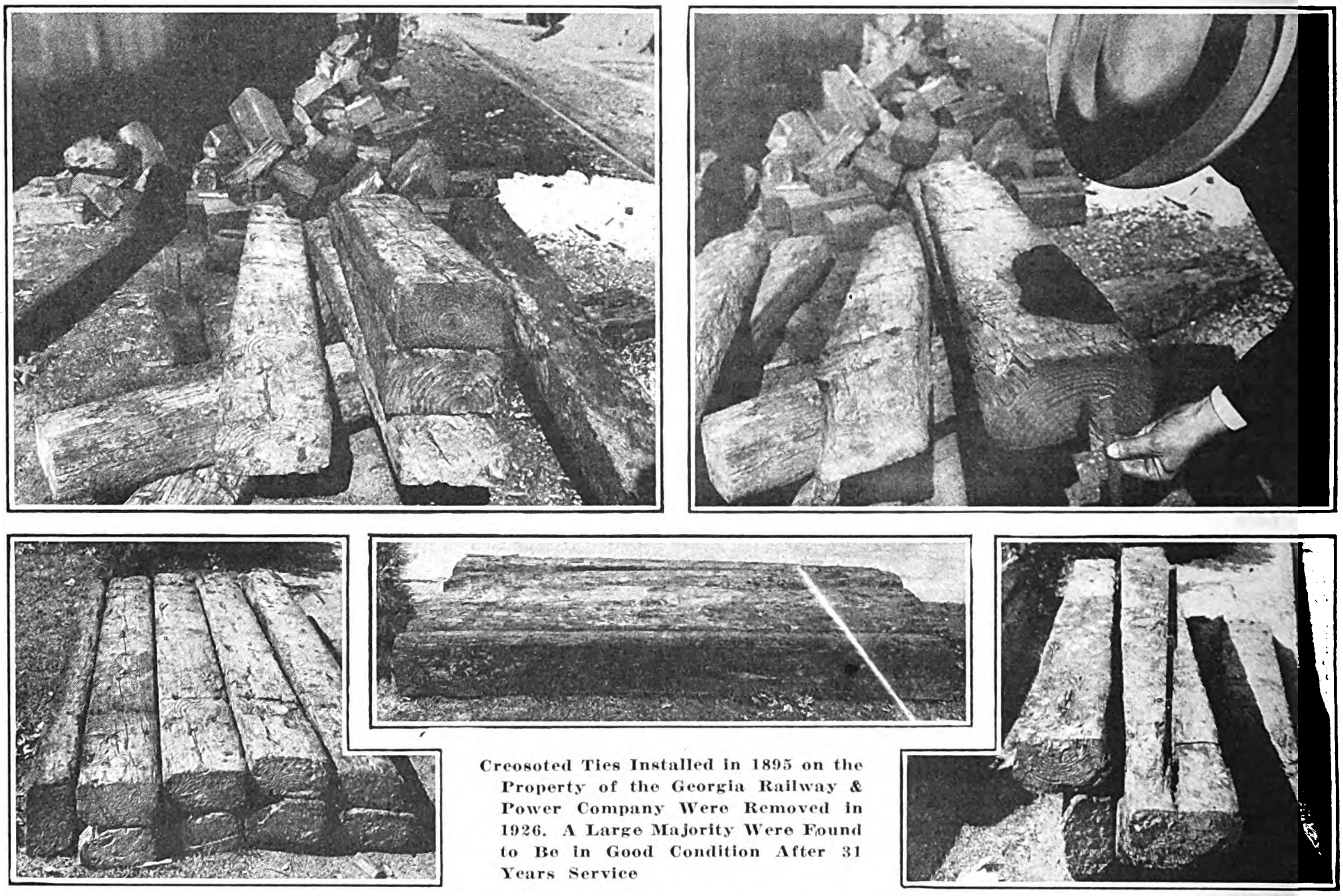
Good results were obtained by this old plant. In 1926 we removed ties from a stretch of track which was built in 1895 using creosoted pine. These ties had been in service for 31 years and a large proportion of them were in sound condition. The small amount of deterioration is seen in the accompanying illustrations showing these ties after removal.

In 1909 we rebuilt our creosote works and installed a


Pop valve, set for 100 lb.
8" Straightway valve and fittings
3"
2"
Face of cylinder flange
Wall
2"
Valve C
5'-1½"
8" Tee
E
K
A
B
Face of cylinder flange
4"x8" Reducing flange
3'-1"
3"
Valve D
Pressure gage
To vacuum pump
Valve
Thermometers
6'4½"
6'
9'-1"
Valve J
F
4"
L M
G
Floor
4½"
4"
Wall
Wall
Boiler
2" Pipe to compressor
Both tanks supplied with steam coils
Vacuum pump
Creosote pumps
Steam exhaust
Feed water heater
Feed water pump
New
8" Straightway valve E
Pressure gage
Discharge
Valve A
Steam supply
To compressor
B
C
K
6'-4½"
54'
28'
11"
J
2"
8"
D
4" Cross
4"
L M
Valve G
To creosote storage
Pressure gage
2" Pipe to exhaust
4'-1"
3"
3'-6"
Face of cylinder flange
3'-1½"
Pop valve, set for 100 lb.
5'-1⅛"
Thermometers
4"
Straightway valve F
Face of cylinder flange
Wall

Creosoting Plant of the Georgia Railway & Power Company, Where All Tie and Structural Timber Is Treated by the Empty Cell Process new pressure cylinder 6 ft. in diameter by 50 ft. in length capable of handling 300 ties per charge. The cylinder, pumps, boiler, etc., were housed in a brick building. The storage tanks were located in a pit back of the building at such a level that creosote could be emptied from railroad tank cars by gravity into the storage tanks.

This plant was operated under the full cell pressure process until 1917. By that time the price of creosote had advanced from 6 cents per gallon to 15 or 20 cents per gallon. For that reason we rearranged our plant, adding a storage cylinder above the pressure cylinder and installing an air compressor with necessary piping so as to use the Rueping or empty cell process with initial air. By the use of this process, penetration is obtained equal to that obtained by the full cell process with a retention of about 6 lb. of oil per cubic foot of timber, instead of from 10 to 14 as with the full cell process. The layout of this plant and its general appearance are shown in accompanying illustrations.



Creosoted Ties Installed in 1895 on the Property of the Georgia Railway & Power Company Were Removed in 1926. A Large Majority Were Found to Be in Good Condition After 31 Years Service

Practically all of our tie and structural timber is treated. We use sap pine timber in all work which does not require a high fiber stress, because this timber can be bought at a very moderate price. In our track construction we use the same class of timber with a steel tie plate beneath the rail on each tie. A creosoted

COST PER YEAR OF A TIE BENEATH PAVEMENT

	Cost of Pavement $1 per Sq.Yd.		Cost of Pavement $3.50 per Sq.Yd.	
	Plain Tie	Creosoted Tie	Plain Tie	Creosoted Tie
Life, years	10	20	10	20
Cost of tie	$0.96	$1.15	$0.96	$1.15
Surfacing	1.50	1.50	1.50	1.50
Paving	2.00	2.00	7.00	7.00
Total	$4.46	$4.65	$9.46	$9.65
Interest, 7 per cent	$0.31	$0.33	$0.66	$0.68
Depreciation	0.45	0.23	0.95	0.48
Cost per year	$0.76	$0.56	$1.61	$1.16
Saving per tie per year	....	$0.20	....	$0.45
Saving per mile per year	....	$528.00	....	$1,188.00

COST PER YEAR OF 1,000 BOARD-FEET OF BRIDGE TIMBER

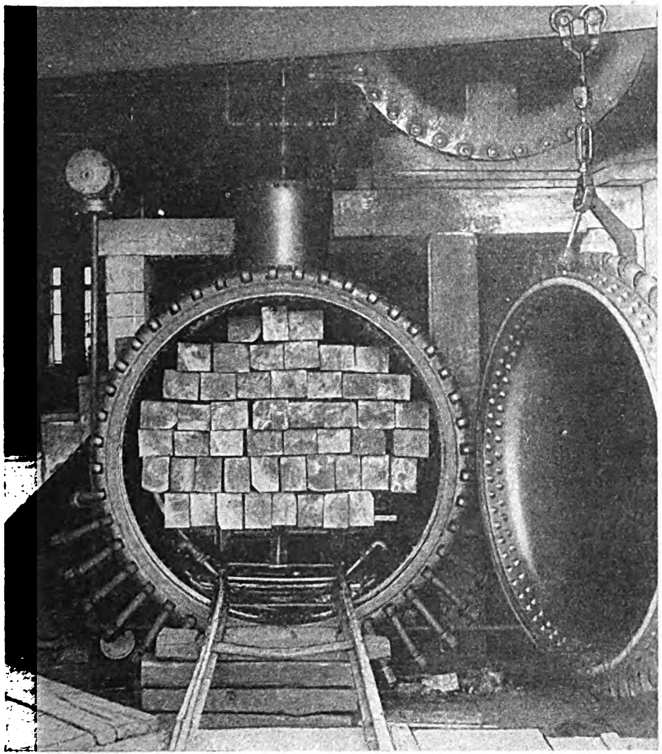
	Plain	Creosoted
Life, years	12	25
Cost, erected	$65.00	$75.00
Interest, 7 per cent	$4.55	$5.25
Depreciation	5.42	3.00
Cost per year	$9.97	$8.25
Saving per year per 1,000 b. ft.	....	$1.72

COST PER YEAR OF A TIE IN OPEN TRACK

	Plain Tie	Creosoted Tie
Life, years	7	15
Cost of tie	$1.02	$1.15
Cost of installation	0.75	0.75
Total	$1.77	$1.90
Interest, 7 per cent	$0.12	$0.13
Depreciation	0.25	0.13
Cost per year	$0.37	$0.26
Saving per tie per year	....	$0.11
Saving per mile per year	....	$290.40

COST PER YEAR OF 30-FT. POLES, CLASS A

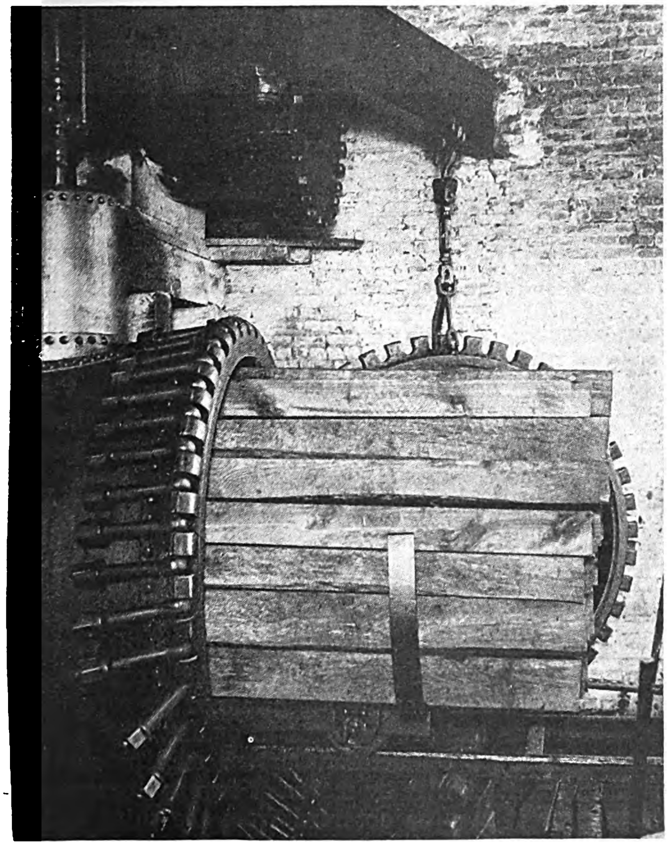
	Chestnut Plain	Pine Creosoted
Life, years	5	22
Cost of pole	$9.00	$11.35
Cost of setting	10.00	10.00
Cost per year	$19.00	$21.35
Interest, 7 per cent	$1.33	$1.49
Depreciation	3.80	0.97
Cost per year	$5.13	$2.46
Saving per pole per year	....	$2.67
Saving per mile per year (105.6 poles)	....	$281.95



A Load of Ties Has Just Been Run Into the Treating Tank at the Atlanta Creosoting Plant

sap pine tie protected against wear by a steel tie plate will last as long as the rail under light traffic and frequently as long as two sets of rails under heavy traffic.

Cost figures for treated and untreated ties and poles are given in accompanying tables. In track with pavement costing $1 per square yard the annual saving has been found to be $528 per mile; with pavement costing $3.50 per square yard the saving is $1,188 per mile. In open track the saving is $290 per mile per year.



Ties for Treatment Are Stacked on a Carriage so that They Nearly Fill the Interior

Similar savings have been made by preservative treatment of structural timber and wood poles. Savings per year per 1,000 ft. b.m. are estimated at $1.72 Savings per mile of double-pole line are estimated at $281.95.

We must consider not only the actual economies in the use of treated timber at the present time, but we should endeavor also to anticipate conditions as they will be some years hence. The annual cutting of timber in this country far exceeds the annual growth. It requires from 35 to 100 years for a second growth tree to reach the size of pole timber, and this pole will last only from five to fifteen years untreated in the ground. It is estimated that with the present rate of cutting, the supply of commercial timber will be exhausted in 35 years. Under these circumstances every effort should be made to conserve the existing supply.

Louisville Editor Lauds Electric Dining Car Menu

Meal Set Before Minnie Maddern Fiske by Interstate Public Service Company Considered Good Substitute for What Once Made Kentucky Famous

DINING car service as supplied by the Interstate Public Service Company, Indianapolis, Ind., has recently aroused the enthusiasm of a Blue Grass editor, as evinced by the following editorial which appeared in the Louisville *Herald-Post* recently:

KENTUCKY'S NEW FAME

There is more than one road to fame. Kentucky used to rely on its production of fine whiskies, fast horses and fair women to lend distinction in foreign parts, but since one of this trilogy has been forcibly suppressed, the state has been considerably puzzled to supply a substitute. An idea of filling this hiatus is supplied by the *Interstate News*, which isn't a newspaper, but a house organ of the Interstate Public Service Company. It informs us that Mrs. Fiske and her company, who recently played an engagement of Ibsen's "Ghosts" at the Brown Theater, left Louisville for Indianapolis via electric car, and in a dining car operated by that company were served the following meal: Dix River tomato soup; Black Mountain turkey; Cranberry sauce à la Middleboro; Cynthiana dressing; Winchester spuds; asparagus Madisonville; hearts of lettuce, Richmond dressing; Harris pumpkin pie or Paducah plum pudding; Louisville roquefort cheese; wafers; coffee; mints.

The significance of this menu is more apparent when it is observed that every mouthful of food was consumed while the players were rolling through our sister state of Indiana. It is tantamount to the suggestion that if you want a good meal while anywhere in the Hoosier State run down to Kentucky.

A reputation for good food is not to be despised. For New Orleans and Paris it has won immeasurable affection. A single article of diet has made the names of some cities known the world over. Boston has lost her culture, but her pre-eminence in baked beans and brown bread is unchallenged. How many on this side would ever have heard of Bologna had not a patriotic butcher of that city once upon a time invented a convenient way of supplying soldiers with spiced minced meat while on the march? Munich and Muenchner, Bermuda and onions, Vienna and bread, Messina and lemons, Ireland and potatoes—they are as twined as roast beef and ale.

In honoring Kentucky's comestibles the Interstate shopped in the Blue Grass, in the mountains and in Louisville. It may never have occurred to Kentuckians before that they live uncommonly well. The Interstate deserves gratitude for discovering us to ourselves and to the rest of the world.

Powerful Locomotives Built for Paris-Orléans Railway

Record Made for Fast Long-Distance Operation—Designed for Maximum Speed of 81 M.P.H.—Each Axle Has Individual Drive

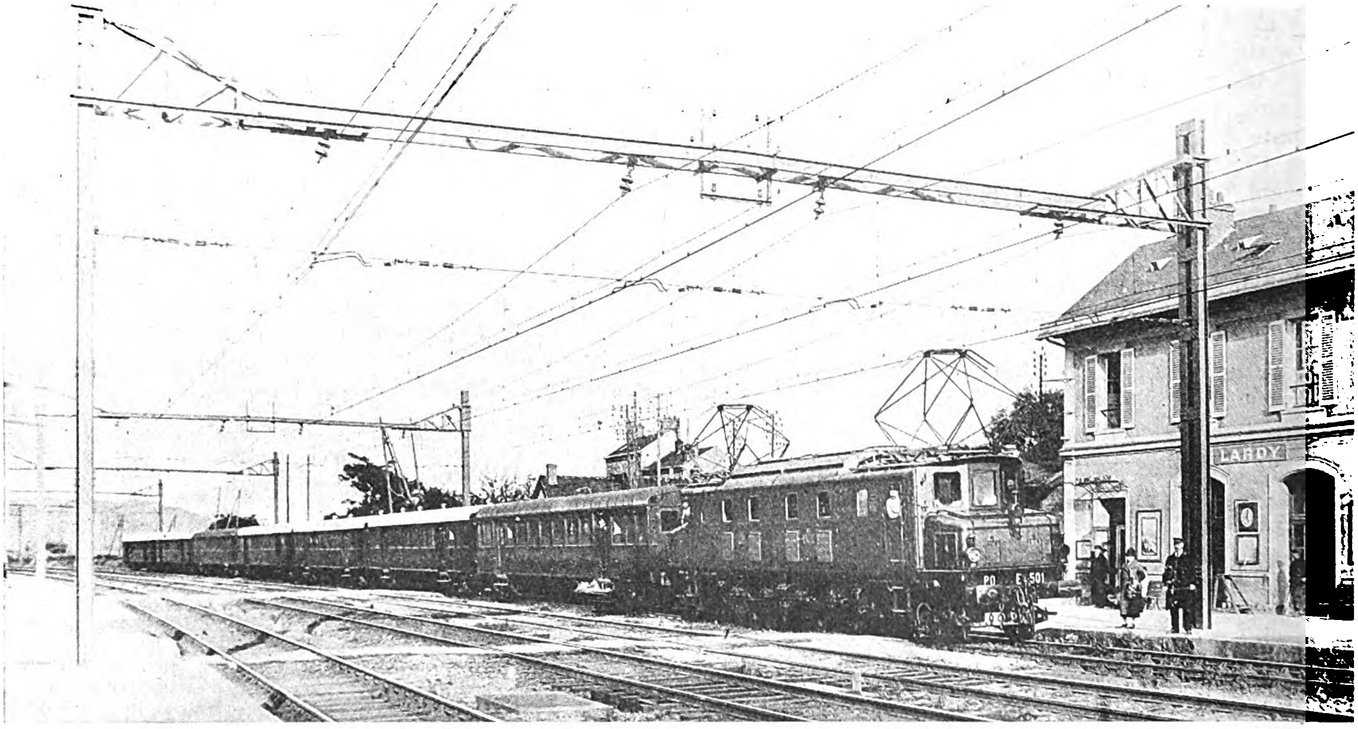
WITH the opening of the electrified section between Paris and Vierzon on the Orléans Railway in France, a new European record was made for long-distance, high-speed operation. On Dec. 22, 1926, the first train, drawn by a powerful express locomotive specially designed for this service, covered this run of 204 km. (127 miles) in one hour and 57 minutes, at an average speed of 105 km. per hour (65 m.p.h.). Over considerable distances a speed of 125 km. per hour (78 m.p.h.) was maintained. The locomotive used on this initial trip was one of two built by the Swiss Locomotive & Machine Works, Winterthur, and equipped electrically by Brown, Boveri & Company, Baden, Switzerland.

Since these express locomotives have been in use on the Paris-Vierzon section it has been possible to shorten the running time substantially. Formerly the journey between Paris-Austerlitz and Les Aubrais occupied 92 to 100 minutes, and that from Aubrais to Vierzon 74 to 76 minutes. After electrification it became possible for trains of 530 metric tons (584 U. S. tons) to operate over these two sections in about 75 minutes and 55 minutes respectively.

The axle arrangement used on the new locomotives is 2-D-2, there being a four-wheel guiding truck at either end, with eight driving wheels between. A one-hour rating of 4,000 hp. is obtained at the wheel treads at a speed of about 73 km. per hour (45 m.p.h.). A continuous rating of 3,300 hp. at a speed of about 78 km. per hour (48 m.p.h.) can be developed. The one-hour tractive effort on the wheels is about 31,960 lb. and that at the continuous rating is 25,350 lb. A drawbar pull of 47,600 lb. can be exerted at starting, i.e., 30 per cent of the 72 metric tons adhesion weight. The loading of the driving axles is 18 metric tons, which is the limit for this railway; the axles of the guiding trucks, which are non-symmetrically placed, carry 10.5 tons and 13 tons, hence the total weight of the locomotive is 119 tons.

Conditions of design were that the locomotives should attain a speed of 130 km. per hour (81 m.p.h.) on a suitable permanent way, and also, at low speeds, be able to traverse curves having a radius of 80 m. (265 ft.). These conditions led to the use on each locomotive of a two-axle truck, fitted with a spring centering device. Individual axle drive was used. This type of drive has been in service for a considerable period on 50 locomotives of the Swiss Federal Railways and elsewhere.

The electrical equipment consists of four 1,500-volt d.c. driving motors, provided with both self-ventilation and external ventilation. Motors can be connected in series, series-parallel or parallel, according to requirements. By the application of field-weakening taps and by shunting parts of the field eleven economical running steps are provided in one of the two locomotives and in the other, thirteen. By the arrangement of each motor group, twelve resistance steps can be obtained, so that besides the running positions already mentioned, 36 other steps are provided which make smooth starting possible. An auxiliary motor-generator set for 1,500/72 volts, connected in parallel with a battery, operates the pilot motor connected to the main controller. This auxiliary set also supplies current to the lighting circuit. The motor compressors and the ventilating motors are designed for a potential of 1,500 volts and are switched in or out, over a small resistance, by a contactor. Current may be obtained from the contact wire by means of two pantograph collectors, or it may be obtained from the third rail by shoes. Experience thus far indicates that the electrical equipment will prove satisfactory and suitable for the work required.



Paris-Vierzon Express on Paris-Orléans Railway Drawn by One of the New 1,500-Volt High-Speed Locomotives

The Readers' Forum

What Does the Public Want—Low Car Fares or Service?

RICHMOND BOROUGH
NEW YORK CITY, Feb. 28, 1927.

To the Editor:

Staten Island, being the borough of Richmond of the city of New York, is vitally interested in the local bus situation. Trolley service has been given on Staten Island for the past 30 or 40 years. Two years ago an independent company started a bus system, most of which is in competition with the trolley company. There is, however, a real need for bus service in newer sections not reached by the rail lines, and also to replace the municipally operated trolley which the city seems anxious to abandon. The bus system now operates without a franchise.

Both the bus system and the trolley company, through a subsidiary, have made application to the Board of Estimate for a permanent bus franchise. The Staten Island Coach Company, the trolley subsidiary, offered an 8-cent fare with universal free transfers from and to all cars and coaches north of Richmond, which includes all but two unimportant lines. The Tompkins Bus Corporation offered a 5-cent zone fare. Transfers were offered at a 2-cent charge, at some points free and at other points none. The transfer feature of the offer was not well understood.

The borough president favors one of these parties, though he has expressed himself as willing to abide by the decision of the public. To obtain the general public sentiment, a local newspaper started a voting and letter-writing contest, in which prizes of $25 were offered for the best letters on the bus franchise question.

An examination of these letters as printed in the newspaper is very interesting. The following is a compilation of the subjects discussed in the 116 letters published:

Priority of service	23
Courtesy of employees	31
Amount and quality of service	84
Condition of equipment	37
Financial responsibility	45
Fare	70
Safety	12
Speed	7
Public relations	33

Naturally the number of subjects exceeds the number of letters, since each letter, on the average, discussed about three topics.

In interpreting these data, a number of things must be kept in mind. For one thing, the letter writers may not represent a fair cross-section of the community, since there were but 116 letters from a population interested of at least 125,000. Also the people of Staten Island may not be representative of the country at large, the people in New York City being notably uninformed about transit matters in general and unacquainted with the progress which has been made in cities where the political influence against efficient transit service has not been so great.

Many of the writers undoubtedly considered speed, safety and equipment under the general heading of service, although the topics discussed under service in most of the letters were about headway, reliability, freedom from breakdowns, territory covered, night cars, etc. The speed of both prospective operators may have been taken for granted as about alike. Courtesy must have been in the minds of those letter writers who discussed the service.

On the subject of fare, those who live within a 5-cent ride of the ferry were strong for the zone system. Those who live further out, where 10, 15 or 20 cents for two, three or four zones would be charged, preferred the 8-cent fare with universal free transfers. One thing stood out, that almost every letter admitted the absolute impossibility of a straight 5-cent fare. The losses of the municipal venture here were offered as proof. There was also a strong sentiment for a straight 10-cent fare with good service, although unfortunately a few writers haggled over pennies here and there. If a clear-cut conclusion may be drawn from the letters printed, with the complicated fare structure outlined, it was that the people wanted good service, and realized that they would have to pay a fare that would purchase the service desired.

The interesting deduction may be drawn that even in New York City service is preferred to the fare, though the fare looms large over other factors. The surprising thing is that speed and safety, at least in city service, were mentioned by so few people.

FELIX E. REIFSCHNEIDER.

Atlanta Devotes Much Attention to Car Appearance

GEORGIA RAILWAY & POWER COMPANY
ATLANTA, GA., Feb. 2, 1927.

To the Editor:

Atlanta is evidently doing her part to get rid of those 25,000 obsolete electric cars. In the last three years she has set the torch to 170 old cars, with ages ranging from 20 to 28 years, and in their place are 196 new four-motor, low-floor cars, weighing 37,500 lb. each. This has resulted in better looking cars, increased rates of acceleration, higher speed, quicker stops and a more satisfactory service.

Free discussion indicates that today individuals are expecting more comfort and speed, and in response to this many electric cars now have rubber tile flooring, deep-cushioned individual seats and streamline exteriors in attractive colors. Present-day cars cost a lot of money, all the way from $14,000 to $18,000 each, and there is no doubt that in many cases the providing of new equipment has been a Herculean task. Now that there are a lot of them in service throughout the country "all dolled up" and looking good an increased responsibility falls on the maintenance department in order to keep them attractive.

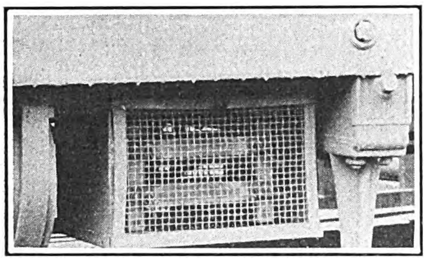
If the rubber tile floor cannot be kept clean, if the upholstered seats are not re-covered perhaps every two or three years and if the attractive exterior is not kept clean by running the car through the paint shop at least every sixteen months, much of the attractiveness may be lost. It is also necessary to provide a fairly smooth and comfortable track for these new cars to run on or else the looked-for gain in receipts may not be realized.

W. H. MCALONEY,
Superintendent of Equipment.

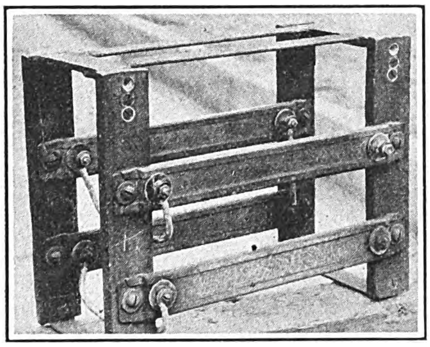
Maintenance Notes

Headlight Resistor Withstands Climate

SPECIAL headlight resistance units are being installed on the Key Route cars of the Key System Transit Company, Oakland, Cal. The unit is placed in series with the headlight to cut down the trolley voltage to approximately 110 so that a 250-watt, 110-volt lamp may be used. The unit is of a special material known as Chromalux, manufactured by the Edwin L. Wiegand Company. It has the properties for withstanding the salt air, fog and sewer gases encountered on the pier route of the Key System. The units are mounted on a wood framework which is suspended under the car, either at the center or under the end frame, where the resistor is subject to all climatic and road conditions. As will be seen in the accompanying illustrations, the resistors are protected by a copper mesh screen.



Special Headlight Resistor, Made of Chromalux Units, Which Withstands Sewer Gases, Salt Air and Fog on the Key Route



The Units Are Mounted on a Wood Framework Which Is Suspended Under the Car

Use best renewals; substitutes
Will soon leave you destitute.

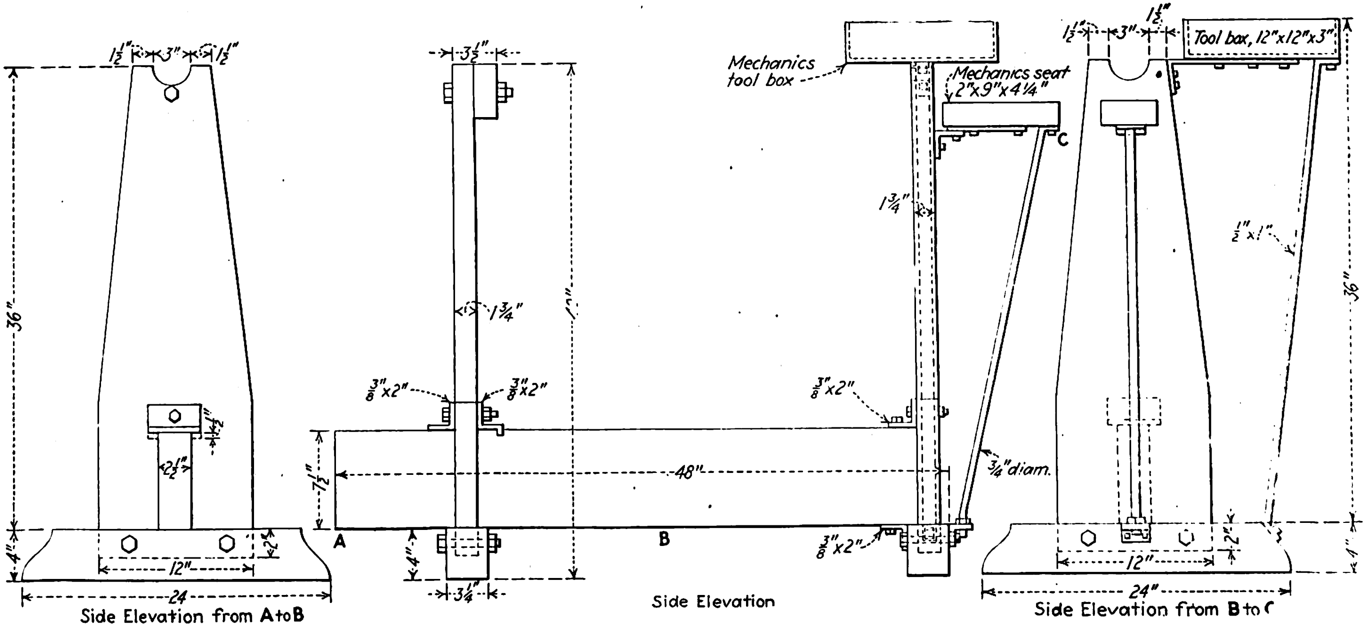
Adjustable Armature Winding Stand

REPAIR and winding of armatures in the shop of the Lynchburg Traction & Light Company, Lynchburg, Va., has been simplified to a marked degree since Master Mechanic Cochran designed and built an adjustable armature stand. The adjustable feature provides a range of pedestal centers that will accommodate the smallest air compressor armature or the largest railway motor armature.

The stand is made of well-seasoned oak. When assembled it occupies a floor space of approximately 24 in. x 48 in. The base consists of two 3¼-in. x 4-in. x 24-in. oak beams and the armature supports are made of 1¾-in. lumber of semi-tapered design with a 12-in. base and a 6-in. top. Each base beam has a recess gouged out 1¾ in. x 2 in. x 12 in., in which is installed the base of the armature support, held in place by two ½-in. machine bolts. One end of an oak timber 2½ in. x 7½ in. x 45¼ in. is fastened to the commutator end armature support by two substantial steel angles. The other end is placed through a 2½-in. x 7½-in. hole in the pinion end armature support. This allows the latter to be moved toward or away from the commutator end support as desired for the armature to be worked upon. Two angles are fastened to the movable armature support. One has a projection extending down on either side face of the 45¼-in. beam and acts as a brace to prevent tipping and a guide to assure alignment at all times.

An added feature is a workman's semi-revolving seat 2 in. x 9 in. x 4¼ in., and a tool and material box 12 in. x 12 in. x 3 in. fastened to the commutator armature support.

Due to its portability this armature stand can be moved to any part of the shop to facilitate working conditions, especially to secure daylight.



Side Elevation from A to B

Side Elevation

Side Elevation from B to C

General Appearance of Adjustable Armature Stand Used in the Shop of the Lynchburg Traction & Light Company, Lynchburg, Va.

No. 10
MODEL 3
AMERICAN

Tilting Table Circular Saw in the Capital Traction Company Shop, with Lumber in Place and Table Set for Angle Cut

Modern Sawing Machine Saves Material and Labor

LUMBER for window, door and vestibule posts was a very large item in the carpenter shop budget of the Capital Traction Company, Washington, D. C., until W. H. McCarty, master mechanic, installed a modern sawing machine. The magnitude of the lumber item was not entirely due to the number of posts required for repair work but rather to the unavoidable waste of material on account of cutting posts with a certain angle by means of an obsolete circular saw. The machine installed to obviate this is an individual motor-operated American No. 10 Model 3 tilting table circular saw.

Where it was possible to cut only two door posts from a certain piece of stock three of these posts can now be made and the waste is extremely small. On this one class of work alone the lumber saving has amounted to at least 35 per cent and the number of operations reduced 75 per cent. Similar saving in material and operations has been shown in practically all of the work where angle cutting is required. It is believed that the machine has fully paid for itself in the few months it has been in service.

Improving Sweeper Brooms

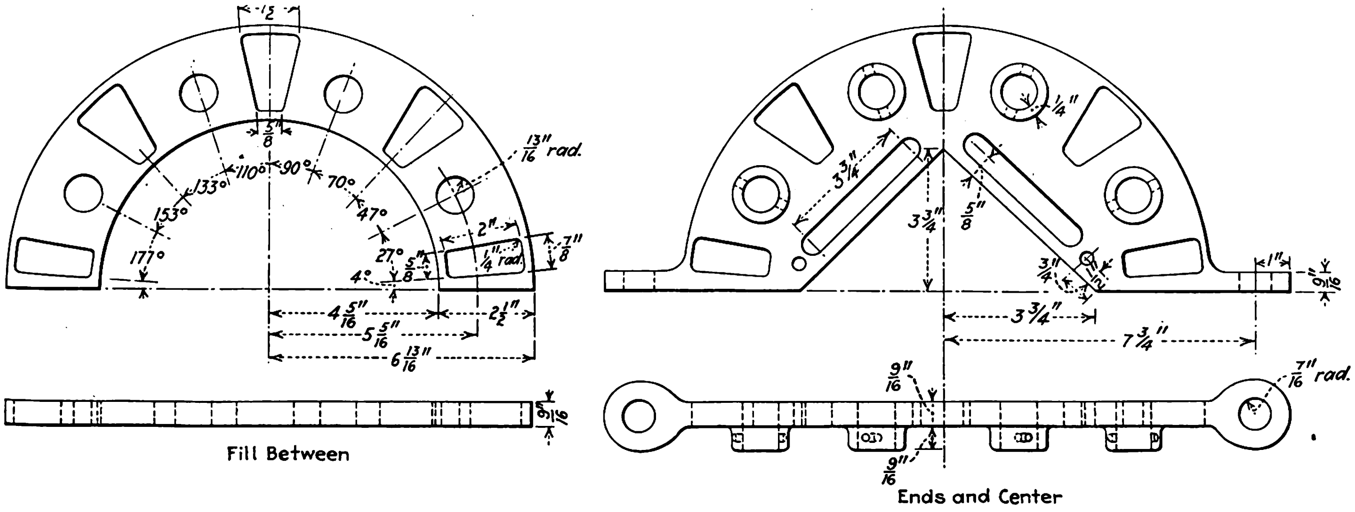
By William J. Smith

Master Mechanic Community Traction Company, Toledo, Ohio

SNOW fighting has not been so great a cause for anxiety on the lines of the Community Traction Company, Toledo, Ohio, since the development in the shop of a new casting for the brooms. Formerly the broomsticks for snow sweepers were inserted through small holes in an iron casting, turned through the back and pushed through a similar hole in the casting about 12 in. away. A board clamped to the back of the casting held the broomsticks in place.

This method proved very unsatisfactory. Not only did the sticks break when they were inserted in the small holes but the board clamped against them turned them at such a sharp angle that they soon broke off in service. During a snowstorm it was customary to have three or four men working overtime to keep the brooms in repair.

A new type of casting has now been developed in which the broomsticks are placed in position in a U-shaped aperture and held firmly in place by an iron rod run through after an entire row has been placed. Since this method was adopted no men have been worked overtime to keep the brooms in repair and they outlast the old style which they replaced.



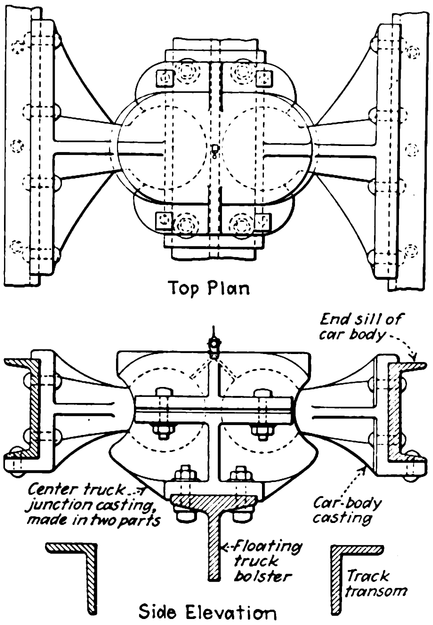
New Broom Castings Overcome Breakage Troubles

New Equipment Available

Universal Joint Coupler for Articulated Cars

For joining articulated car units a new type of universal joint coupler is being marketed by the Universal Car Parts Corporation, Baltimore, Md. The coupler is the invention of Joseph M. Suarez and includes four castings designated as lower socket, upper socket and two car end connections. Each of these latter parts has a ball which fits into a hemispherical socket in the lower and upper socket members. The lower member is secured to the bolster on the center truck and the upper one is fastened to the lower, thus providing two complete ball sockets which engage the respective balls of the car end connections.

Each car end connection is thus free from engagement with the other and can be disconnected from the center truck without interference with the other car end. The two-ball coupler is designed to take track curves of short radius such as are encountered in electric railway service. The lower sockets retain the lubricant and the pocket construction prevents waste. The upper and lower socket members are separated by gaskets which can be adjusted to compensate for the wear of the ball joints.



Construction of Universal Coupler for Articulated Cars

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 16-17—Central Electric Traffic Association meeting, Lincoln Hotel, Indianapolis, Ind.

March 17-18—Illinois Electric Railway Association, seventh annual joint convention, Hotel Abraham Lincoln, Springfield, Ill.

March 24—New England Street Railway Club, annual meeting and banquet, Copley-Plaza Hotel, Boston, Mass.

April 1—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

Association News & Discussions

Prizes to Be Awarded for Papers on Arc Welding

The sum of $17,500 has been placed with the American Society of Mechanical Engineers by the Lincoln Electric Company, Cleveland, Ohio, to be awarded by the society for the best three papers disclosing advancement in the art of arc welding, presented under the rules of the competition. The prizes to be awarded are $10,000 for the first, $5,000 for the second and $2,500 for the third. The purpose of the competition is to encourage improvement in the art of arc welding, the pointing out of new and wider applications of the process, the discoveries of improved methods of testing welds to insure their integrity, or indicating advantages and economies to be gained by its use.

The competition will be judged by a committee of the American Society of Mechanical Engineers and any one may compete. Papers must be sent in duplicate to the secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y. All exhibits must also be in duplicate and captions, titles, legends and notes must be in the English language. All papers must bear evidence of having been sent before Jan. 1, 1928, in order to be considered and must be received by Jan. 31, 1928.

Every paper should include necessary drawings, photographs or other exhibits, in order that the disclosures may be complete. Originality of design is preferable, either in the method of applying the weld or in the design of the welding parts for their arrangement. Designs which are of no practical use will be considered only in case they include suggestions which could self-evidently be applied in other ways than those suggested. Methods of applying the arc or the welding art, which will improve existing machines or make commercially possible machines which in the light of previous engineering have been regarded as impractical, are specially desired.

In submitting papers each competitor gives the American Society of Mechanical Engineers the right to publish the paper should the society desire to do so. No papers will be returned to any competitor. It is the purpose of the American Society of Mechanical Engineers to present these awards at the stated spring meeting of the society in 1928. All competitors will be notified promptly of the action of the judges. The American Society of Mechanical Engineers has issued a bulletin giving complete information regarding the competition. Copies of this may be obtained by addressing the secretary.

New England Club Banquet March 24

Plans are well under way for the 27th annual banquet of the New England Street Railway Club. As is customary, it will be held March 24 at the Copley-Plaza Hotel, Boston. Dinner will be served at 6:30 p.m. for members and gentlemen guests. Music will be furnished by the Connecticut Company Employees' Band.

Edward Dana, general manager Boston Elevated Railway, will be toastmaster. The speakers will be Gov. Alvan T. Fuller of Massachusetts, Mayor Malcolm E. Nichols of Boston, Hon. B. F. Cleaves, former chairman Maine Public Utilities Commission, and Frank P. Sibley, special correspondent of the Boston *Globe*.

The annual meeting of the club will be held at the hotel at 3 p.m., at which time officers for the ensuing year will be elected.

Central Master Mechanics Appoint Committee

Committee appointments of the Central Electric Railway Master Mechanics Association have been announced for the present year by President G. R. Green. A full list of appointments follows:

Executive — G. R. Green, president C.E.M.M.A., general superintendent Chicago, South Bend & Northern Indiana Railway, chairman; F. J. Foote, vice-president C.E.M.M.A., Springfield, Ohio; L. E. Earlywine, secretary C.E.M.M.A., Indianapolis, Ind.; Charles Sigler, Warsaw, Ind.; T. H. Nicholl, Anderson, Ind.; J. W. Osborn, Elyria, Ohio; A. W. Reddersen, Fort Wayne, Ind.

Arbitration—J. B. Corderman, master mechanic Lima Toledo Railroad, Lima, Ohio, chairman; R. E. Cornwell, South Bend, Ind.; H. F. Coleman, Fort Wayne, Ind.; Theodore Cox, Springfield, Ohio; R. C. Taylor, Albion, Mich.

Membership—R. E. Twiggs, master mechanic, Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, chairman; A. W. Brownsworth, Sandusky, Ohio; W. J. Smith, Toledo, Ohio.

Reclassification of Accounts—P. V. C. See, superintendent of equipment Northern Ohio Power & Light Company, Akron, Ohio, chairman; T. H. Nicholl, Anderson, Ind.; A. W. Reddersen, Fort Wayne, Ind.; C. M. Bange, Scottsburg, Ind; J. W. Osborn, Elyria, Ohio.

Standardization—T. H. Nicholl, superintendent of motor power and equipment Union Traction Company of Indiana, Anderson, Ind., chairman; A. W. Reddersen, Fort Wayne, Ind.; C. E. Snyder, Tippecanoe City, Ohio; Charles Sigler, Warsaw, Ind.; J. F. Seigle, Newark, Ohio; J. D. Barnhart, Decatur, Ill.; C. M. Bange, Scottsburg, Ind.

Subjects—A. J. Challeen, superintendent of shops Detroit United Lines, Highland Park, Mich., chairman; J. B. Corderman, Lima, Ohio; J. W. Osborn, Elyria, Ohio; W. J. Fox, Scottsburg, Ind.; G. A. Stiles, Columbus, Ohio.

Uniform Charges for Repairs to Interchanged Equipment—W. A. Coleman, superintendent Dayton & Western Traction Company, West Alexandria, Ohio, chairman; A. F. Rolston, Stratford, Ohio; Allan Karns, Bowling Green, Ohio; Theodore Cox, Springfield, Ohio; M. M. Lloyd, Michigan City, Ind.

American Association News

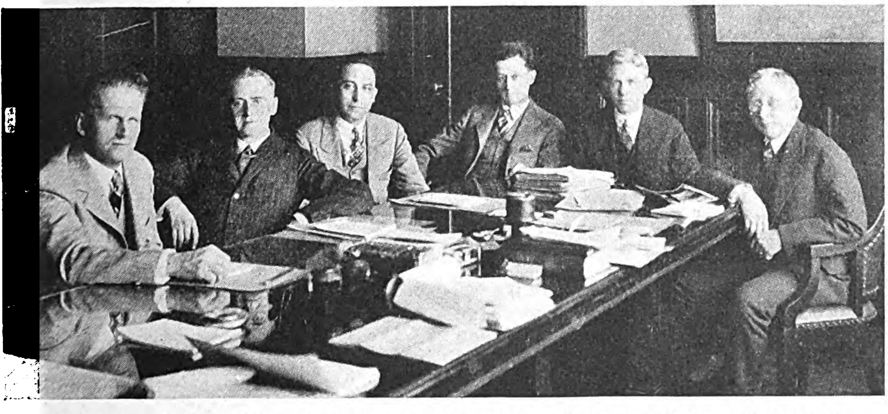
Exhibit Committee Appointed

PRESIDENT W. H. SAWYER of the American Electric Railway Association has announced the personnel of the exhibit committee for the 46th annual convention and exhibit, scheduled to take place in the Cleveland Public Auditorium and Annex, Oct. 3 to 7 inclusive. Col. J. H. Alexander, president Cleveland Railway and chairman of the exhibit committee, has called a meeting of the entire committee at his office, Hanna Building, Cleveland, Ohio, for 10 a.m., Friday, March 18. This meeting is for organization purposes, to go over and approve pending contracts, to lay out floor space showing detailed arrangement of booths, etc. The personnel of the committee is as follows:

Col. J. H. Alexander, president Cleveland Railway, Cleveland, Ohio, chairman.
C. E. Morgan, Brooklyn, N. Y., vice-chairman.
J. W. Welsh, New York, N. Y.
Fred C. J. Dell, director of exhibits, A.E.R.A., New York, N. Y.
H. H. Adams, Chicago, Ill.
L. D. Bale, Cleveland, Ohio.
Herman Bender, Cleveland, Ohio.
C. P. Billings, Pittsburgh, Pa.
R. M. Campbell, Philadelphia, Pa.
T. W. Casey, New York, N. Y.
C. H. Clark, Cleveland, Ohio.
J. F. Collins, Jackson, Mich.
S. G. Down, Wilmerding, Pa.
B. C. Edgar, Nashville, Tenn.
J. F. Egolf, Highwood, Ill.
H. F. Flowers, Findlay, Ohio.
Charles Gordon, New York, N. Y.
L. E. Gould, Chicago, Ill.
R. N. Graham, Youngstown, Ohio.
R. A. Hauer, New York, N. Y.
C. S. Hawley, Albany, N. Y.
B. A. Hegeman, Jr., New York, N. Y.
A. P. Jenks, Chicago, Ill.
A. E. Kasemeier, Cincinnati, Ohio.
H. J. Kenfield, Chicago, Ill.
G. L. Kippenberger, St. Louis, Mo.
S. P. McGough, Chicago, Ill.
J. S. Pevear, Birmingham, Ala.
A. L. Price, Mansfield, Ohio.
Harry Reid, New York, N. Y.
A. M. Robinson, Philadelphia, Pa.
S. P. Seward, Cleveland, Ohio.
L. W. Shugg, Schenectady, N. Y.
D. W. Snyder, Jr., Springfield, Ill.

Purchases and Stores

PREPARATION of the report to be presented at the annual convention of the Engineering Association occupied the attention of the committee on purchases and stores at a meeting held on March 1 and 2. The committee met in the offices of the Virginia Electric & Power Company at Richmond, Va., on invitation of J. Y. Bayliss, director of purchases and supplies. Other members present were John Fleming, chairman; B. W. Forkner, A. A. Ordway, W. J. Walker and A. E. Hatton.



Members of Committee on Purchases and Stores at Recent Richmond Meeting
From left to right—B. W. Forkner, A. A. Ordway, W. J. Walker, A. E. Hatton, John Fleming and J. Y. Bayliss.

Metropolitan Section Keeps Posted

NEW developments in the transportation industry were discussed at a well-attended meeting of the Metropolitan Section, A.E.R.A., held at the Engineering Societies Building, New York City, March 4. Various phases of the business were treated by the several speakers selected by the sponsor group committee, of which C. R. Jones was chairman.

J. B. Donley, director of public relations Pittsburgh Railways, told of the new ideas developed to sell transportation. He outlined the various steps through which the company has passed from receivership to its present enviable position. How new franchises were secured and friendly relations established with municipal authorities and with the general public were brought out. He gave interesting information on the recent "Ride the Trolley Week" which was the subject of a comprehensive article in ELECTRIC RAILWAY JOURNAL for Jan. 29. Particular emphasis was laid on the policy of the management to lay all its cards on the table in dealing with the public and its employees.

On account of the illness of Charles Gordon the subject of recent developments in car equipment was discussed by John A. Dewhurst, associate editor ELECTRIC RAILWAY JOURNAL. He brought out forcibly the influence which the automobile has had upon the local transportation situation. The industry has changed from a non-competitive necessity to a competitive convenience, he said. This has made it necessary to improve the common-carrier vehicle to a point where its service approaches that of the private automobile in comforts and attractiveness. He mentioned the importance of light-weight construction, improved seats, automatic treadle exits and similar features. His talk was illustrated by lantern slides showing new cars operated on various electric railways throughout the country and interesting details.

Moving pictures illustrating the latest transportation developments in the metropolitan area were presented by Horace Sisson of the Sisson Supply Company. Included in this were views taken on the properties of the Richmond Light & Railroad Company, Brooklyn City Railroad, New York Railways and Public Service Railway.

E. M. T. Ryder, way engineer Third Avenue Railway, spoke briefly about the latest things in track construction. He called attention particularly to the method used by his company in making butt-welded joints. H. F. Merker, chief engineer Brooklyn City Railroad, also spoke briefly on track matters, but expressed a view somewhat different from that of Mr. Ryder concerning butt-welds. He spoke of the importance of ELECTRIC RAILWAY JOURNAL as an agency to keep the industry posted on developments.

The meeting was concluded with a talk by James O'Shaughnessey, National Association Advertising Agencies. He told how advertising has made friends for countless manufactured products and pointed out its possibilities as a means of winning public favor.

The News of the Industry

Money for Bondholders

Redemption and Interest on Seattle Railway Paid—Extension of Time on Purchase Bonds Defeated

Ignoring an order of the Superior Court temporarily tying up the funds, City Treasurer Ed L. Terry, Seattle, Wash., with the concurrence of other city officials, on Feb. 28 telegraphed $1,142,835 to the city's fiscal agent in New York, for payment of the bond redemption and interest due on March 1 on the Seattle Municipal Railway, purchased from the Stone & Webster interests in 1919.

Attorneys for John G. Von Herberg, who is suing the city to force the payment of salaries and other costs of operation ahead of installments on the purchase bonds, refused to enter into a stipulation, as demanded by Corporation Counsel T. J. L. Kennedy, whereby the city would be permitted to make the bond payment when due. Mr. Von Herberg charges as unlawful loans totaling $735,000 from the city light department to aid the municipal railway in its present entanglement of finances and litigation. In Mr. Kennedy's diagnosis of the situation, a successful prosecution of the specific performance suit brought in federal court by the Puget Sound Power & Light Company against the city would be likely if the city defaulted on the purchase bonds, in which case the city would have to operate the railway from money of the general fund, leaving first revenues of the railway for the holders of the purchase bonds.

J. G. Von Herberg Continues Protest

Attorney Robert P. Oldham, for Mr. Von Herberg, asserts that his suit for payment of salaries still stands, and the fact that salaries now may be paid from an "unlawful transfer of funds" does not affect the situation. Mr. Oldham points out that the city has violated the temporary restraining order of the Superior Court, and Mr. Von Herberg in an open letter protests against such action, and strongly criticises the Council for its action in violating a court order.

Efforts of the Puget Sound Power & Light Company to amend the bill now pending in the Washington Legislature providing for an extension of time on the Seattle Municipal Street Railway purchase bonds have failed in the Senate committee on cities of the first class.

The bill that was favored by the city was voted out of committee with the unanimous recommendation that it pass without the Puget Sound company's amendment.

A. W. Leonard, president of the Puget Sound company, after a conference with Mayor Bertha K. Landes, announced that his company will not pursue further its efforts to attach an amendment to the bill, because while he feels that the amendment is justified, it is feared it may defeat the entire measure, with the result that all negotiations for bond extensions would be held up until another session of the Legislature.

The amendment, in the opinion of Corporation Counsel T. J. L. Kennedy, Mayor Landes and other city officials, would have the effect of making the extended bonds a general obligation of the city, instead of merely a lien on the gross revenues of the street railway utility. Puget Sound officials insist that the amendment was merely for the purpose of restoring the bonds to the same status they have at present.

Another phase of the railway financial troubles came up when the United States Supreme Court in Washington, D. C., on Feb. 28 announced that it would not act as referee in the $545,000 tax battle between the Puget Sound Power & Light Company and the city, and dismissed applications for writs of certiorari filed by the litigants. This decision means that the city's general fund is not liable for the payment of the city's share of the street railway taxes for 1919. The Circuit Court of Appeals held that the street railway must pay the taxes, but that the money must come from the revenue of the utility. The Puget Sound company filed application for a writ of certiorari on the ground that the taxes should be an obligation against the city. The city, contending that the city does not owe the tax money, filed application for a cross writ of certiorari. The dismissal of both applications leaves the decision of the Circuit Court of Appeals still in effect.

Fare Change Sought

Company at Houston Desires Sliding Scale—Needs $1,000,000 to Keep Pace with Growth of City—Auto Registration Increased in Six Years—Bus Service Unprofitable

N A petition filed Feb. 28 with the City Council of Houston, Tex., the Houston Electric Company proposes a fare adjustment based on a sliding scale, which would permit regular patrons to enjoy the same rate as heretofore, or possibly less, the occasional rider to pay as high as 10 cents. The company states that an increase in fare is necessary to realize an adequate rate of return on its investment. Profits for 1926 were scarcely more than 3 per cent. Expenditures totaling $1,000,000 will be necessary in 1927 to keep pace with the development of the city. In a full-page advertisement, signed by Jeff L. Alexander, manager, the people of Houston are acquainted with the plan of the company.

Mayor Oscar Holcombe said that the city would take time to consider whether the adjustment was merited. An investigation will be made and a hearing held, the Mayor explained. While the Council is investigating the requested rate adjustment, the company plans to lodge a campaign of public information by distributing circulars on cars and buses and using newspaper advertising to tell why the increase is needed.

The company introduces its petition with the explanation that within a short time the three-year construction program, outlined in an agreement between the company and a committee of citizens of Houston, will have been completed. The company obligated itself to spend $1,500,000 within three years on extensions. Other improvements not included in the agreement have been carried out by the company and the total expenditures to date have been $1,650,000. The company now claims that $1,000,000 is needed to keep pace with the growth of Houston and presents the problem of from what source the $1,000,000 of new money can be secured.

With a record of earning only $4,905 with which to pay interest on the $3,627,358 of new money invested during the past thirteen years, it was easy to understand why investors do not want to purchase additional securities of the company. According to the petition the people of Houston have purchased securities liberally, believing, as did the company, in the future of public transportation and the fairness of the citizens and city authorities to permit the company to earn a reasonable return on money so invested. While the interest has been paid on the securities it has come as a sacrifice from the original security holders, and if further securities should be offered and sold the interest paid on them would in turn come as a sacrifice from the present holders of securities located in Houston and elsewhere. Under the circumstances, the company would not be justified in asking people to invest further in the company's securities and could not expect them to do so.

The difficulties through which the company has passed since the outbreak of the European war were enumerated in a brief historical summary included in the petition. Mention was made of the operation of jitneys which depleted the revenues of the company, the expansive improvement program and the substantial addition to its investment. The relief offered through various means would have proved sufficient to keep the company in good financial condition, except for further depletion of the revenues by diversion of traffic from its cars to privately owned automobiles. The effect of the ownership and use of private cars was shown by the number of revenue passengers on the Houston car lines since 1920 and Harris County's auto registration during that same period. The auto registration for the year ended Dec. 31, 1920, was 22,032, and for 1926, 60,922. The number of revenue passengers in 1920 was 35,222,621 and in 1926 42,082,233. Elimination of the jitneys helped to increase the number of passengers on the car lines from 1923 to 1926. To regain by an increase in fare from present car riders the revenue lost through automobile development would mean an increase in the present fare of more than 3 cents per ride.

Reference was made in the petition to the efforts made to facilitate riding—the means to make the service more attractive, the advertising and general merchandising methods and the investment in buses being proposed to that end. The bus operation, however, has been unprofitable, the amount earned on the investment being less than 1 per cent. However, the petition states the net result is more satisfactory than the investment in car lines would have been to serve the same territory.

The service now needed cannot be provided until new equipment is purchased. Plans and specifications for new cars of modern design are now in the hands of the car builders awaiting orders to begin work. The additional revenue needed for the purposes above enumerated plus added taxes to be paid to the city and state on gross earnings is equivalent to an additional fare of approximately 1½ cents for each passenger now carried.

A schedule of rates should be promulgated which will permit those who use the service regularly to pay a fare considerably less than those who use it occasionally. The wholesale rate would be made available by the purchase of a weekly ticket sold by the trainman, which when presented to the operator would entitle the bearer to ride for a 5-cent fare, the ticket to be transferrable and made available for use by any member of the family, or any one else who may present it. Under the plan of a wholesale rate or sliding scale of fares the additional revenue needed by the company would be paid very largely by those who use the service only occasionally. The infrequent rider, who uses the automobile except when it is not available, certainly should not object to paying a cash rate not to exceed 10 cents, particularly if tokens were sold at a liberal discount.

In conclusion the petitioner stated:

> In asking for this adjustment, it is not our purpose to secure a rate which will produce any more revenue than is necessary for the company to put its finances in condition to maintain proper service and continue as a factor in the development of the city. There are those who will, of course, hold views different from the conclusions we have reached, and to them or any one else we desire to extend an invitation to ask for or call to secure any further information necessary for thorough understanding of the matters herein discussed.

Beaver Valley Honors Twenty-five-Year Men

In New Brighton, Pa., there were reunion and rejoicing recently in celebrating the affiliation of thirteen employees with the company for 25 years or more. A feature in this connection has been the organization of the Twenty-Year Club, in which, in addition to the 25-year men, will be included five more men who will reach the 25 years of service mark during the current year.

A banquet was held at the Pittsburgh Athletic Association Club to permit A. W. Robertson, the president of the Philadelphia Company, and Vice-President Thomas F. Fitzgerald, former General Manager W. H. Boyce and Personal Director W. G. Marshall to be present. The trip was made by Beaver Valley motor coaches and was one of the high spots of the occasion, which later reached the point of solemnity when the officers of the company, in their addresses, referred to the loyalty of the group of men and pictured the happenings of joy and sorrow in the 25-year period which they had served their company and the public.

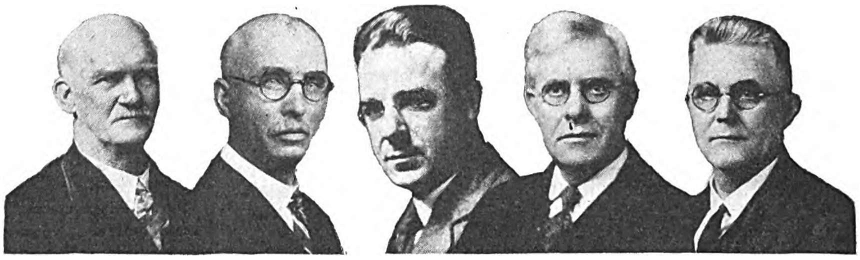
Clinton D. Smith, general manager, presided at the banquet and presented each of the men to the officials of the parent company. In doing this he briefly sketched events in the life of each, saying: "I find inspiration and keen pride in reviewing the service of these men and their contribution toward the prestige, stability and success of our company."

In token of the service rendered and the continuity of it, General Manager Smith presented a gold watch charm to each of the thirteen men. The face of this charm bore a reproduction of the service with the figures "25 years," while the back bore the name of the employee and the date he began work. A. W. Robertson, president, and Thomas Fitzgerald, vice-president, both made grateful reference to the long term of employment and expressed a bright future for the property in the group represented.

Mr. Boyce, the former general manager, referred to his personal contact and told some of the experiences during the early days of the local lines when track, cars and equipment were not so efficient as they are today.

Of the thirteen men, two have been pensioned and eleven are still in active service with the Beaver Valley Traction Company. They are J. R. Marshall, superintendent of transportation; H. J. Meyer, superintendent of equipment; W. F. Allshouse, track supervisor; I. J. French and David Hall, pensioned employees; W. J. Moffett, P. F. Householder, C. P. Hayward, A. E. Price, H. McMillen, John Myers, William Myers and Robert J. McClymonds.

During 1927 the five men who will reach the 25 years of service mark are M. D. Ayers, W. T. Byers, James Davidson, James Graham, D. Lee Noss and Alex Webster. This will make a total of seventeen men who have been with the company 25 years, practically 10 per cent of the total number employed locally. The Twenty-Year Club will perpetuate for all time the tribute due those who have served and continue to serve faithfully a community of people.

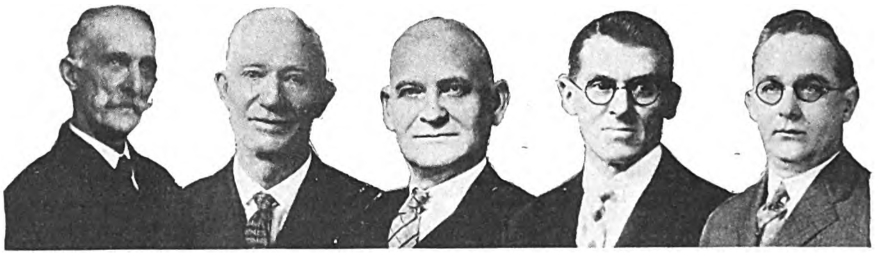


I. J. French W. J. Moffett Clinton D. Smith, Manager John Myers C. P. Hayward

David Hall P. F. Householder

Twenty-five-Year Men of the Beaver Valley Traction Company

Albert Price Wm. Myers



Henry McMillen W. F. Allshouse John R. Marshall R. J. McClymonds H. J. Meyer

Kansas City Grant Ready

The proposed 30-year franchise for the Kansas City Public Service Company, the successor to the Kansas City Railways, was introduced in the Council on March 3 at a special meeting called for that purpose. It was referred, without discussion, to the Council as a committee of the whole for public hearings. Attached to the ordinance was a report of the special committee in whose name the measure was introduced. The report set forth the leading provisions of the proposed grant and unanimously recommended its adoption.

Mr. Gossett, the chairman of the committee, said the ordinance was not introduced at a special meeting in an attempt to hasten matters; that it would take its usual course through the Council, and that public hearings would be had as long as necessary. He said it was the desire of the committee that the ordinance come up for final action on March 21. Should it be passed on that date it would become effective March 31. The company would have twenty days in which to accept it. The grant not being for more than 30 years, the action of the Council is final, under a provision of the charter, and will not have to be submitted to a popular vote.

The franchise committee has been at work since early in November, following the adverse referendum. On Dec. 11 the committee submitted to the Council its recommendations for the basis of the ordinance. Those the Council adopted unanimously on Dec. 20, reserving the right to withdraw its approval if the suggestions were not generally followed.

Will Appeal for Eight Cents in St. Louis

Receiver Rolla Wells of the United Railways, St. Louis, Mo., is preparing to appeal to the United States Supreme Court in an effort to regain the 8-cent fare or two tokens for 15 cents rate which was temporarily in effect under a federal court injunction from Feb. 7 to March 1. Thomas E. Francis, counsel for Receiver Rolla Wells, has already notified City Counselor Muench that an appeal to the highest court would be made. The city will vigorously resist the petition. A special court composed of three federal judges sitting at Kansas City refused to make the temporary fare permanent and ruled that the company was not entitled to the raise, but should await action by the Missouri Public Service Commission, before which an application for the 8-cent fare has been pending since June 7, last.

Delay in Brooks-Coleman Act

Proposed repeal of the Brooks-Coleman act of 1921 placing valuation of electric railway properties and regulation of rates in charge of the Minnesota Railroad and Warehouse Commission seems lost at the present biennial session of the Legislature in St. Paul. The Senate adopted a report of the general legislation committee for indefinite postponement, 41 to 23. While the matter is still in the House it is not expected to come up. Five Minneapolis Senators voted for the report against three opposing. The bill was introduced by Senators Henry Morin of Duluth and Charles Hausler of St. Paul, both cities opposing the present law. The Senators who opposed the change hold that rate making should be in the jurisdiction of a disinterested body, such as the state commission, and that otherwise the law does not take away from cities the control of electric railways. The report of the Senators followed several public hearings in the Capitol.

Progress in Campaign to Reclaim Michigan Road

After several months of solicitation for stock subscriptions, residents in the villages and communities along the abandoned Grand Rapids, Holland & Chicago Railway at a mass meeting on March 8, in Grandville, Mich., voted to purchase that part of the defunct road between Jenison and Grand Rapids. Authority to purchase was given by the campaign committee of the United Suburban Railway, as the new company will be known. According to Harold T. Slaght, chairman of the finance committee of the new company, the purchase price as arranged by his committee and representatives of the Heyman-Michaels Company, Chicago, which purchased the line at receiver's sale, is $30,000. The finance committee was also authorized to purchase and string new trolley wire at a cost of $7,500 and to purchase cars. The committee started on March 9 to complete the negotiations with the Michigan Railway for use of the tracks from the west city limits of Grand Rapids to the downtown station of the latter company. This agreement will be made on a car-mile basis which is considered favorable to economy in operation.

It was estimated that $52,250 would be required for the United Suburban Railway to begin operation. This would include the purchase price, the expense of the trolley wire, incorporation, insurance and the fund for operation. Reports at the mass meeting showed that $45,210 had been subscribed, leaving a balance of $7,040 to be raised before running of cars can be begun.

A call was authorized for a general meeting of the stockholders to be held in Grandville on March 21, to elect directors for one year. In the meantime members of the finance committee of the proposed company will meet with representatives of the Consumers Power Company, which owns the right-of-way, to arrange to have the new interurban lease the right-of-way on favorable terms.

Following a survey, Chairman Slaght said if the new line could carry as many passengers as had been carried by the old line it would make a profit. One big factor, he said, would help the new company. That was the possible elimination of personal taxes, as the line would be a community affair.

Leaders in the new company said there was a possibility of beginning service within the next 60 days. The line, double track, will be 8.3 miles in length. It will serve about 20,000 people in Burlingame, Beverly, Wyoming Park, and other sections.

Co-operator Greets Operator in Philadelphia

The bonds of a new friendship between the management of the Philadelphia Rapid Transit Company, Philadelphia, Pa., and its employees were tied on Feb. 25 with the première of the P.R.T. *Co-operator*, acting as agent provocateur. Many employees have felt the need of this community of interests sheet and have suggested some such avenue of communication which might carry a message to the employees rather than to the stockholder and car rider as does *Service Talks*.

Not imposing but impressive is the exterior view of the initial number, with a Mitten moral on labor and profits boxed in its center. Its contents consume fourteen pages which fulfill the purpose of the booklet—an appeal to the employee. Here is an announcement of the company's campaign to win depositors for the Mitten Bank, in which every employee is a stockholder; also a bank statement that would satisfy a Ripley analysis, and portraits, too, of the employer and employee directors—a financial democracy shouting from the pages their faith in this system. And here's a page story of the company's new headquarters and an account of the saving fund transfer, and gossip—Motorman Weiss carries around with him lilies, fearing contamination with Philadelphia passengers. No! they are Ruskin's lilies—Sesame and Lilies.

Unfortunately the *Co-operator* will appear at no definite period, but happily when it does come it will have "something really worth saying." Fellow employees, avid in anticipation of this paper, are invited after a perusal to be critical in their comments, to be sent to 1520 Spruce Street.

Life of Fellow Worker Saved by Lineman of Connecticut Company

John J. Borzillo, a lineman of the Connecticut Company, New Haven, by quick thought and daring action saved the life of a fellow-workman of the Winchester Repeating Arms Company who was untying cables at the top of a 40-ft. pole. The rescue took only ten minutes. Just in time to release the arm of the trapped man, who had caught it under one of the 500,000-circ.mil cables carrying 440 volts, a.c. on the bridge on which he was working, Borzillo jumped from the cage of the trolley line truck where he was removing a wire in order that the bridge might be raised and ran to the man, 200 ft. away. He stopped only a second to strap on his spurs and then climbed the pole, and with his foot placed against one of the crossarms lifted the feeder and pulled out the man's arm.

Winchester men who were working on the bridge job threw a rope to him from the roof of the building opposite. He caught it and tied it about his body and through the "D" rings of his body belt lowered himself and the rescued man to the ground. Two men working on the ground rushed the injured man to the emergency hospital, where he arrived in time to be treated. No serious harm resulted.

Governors' Messages Concluded

The digest of the Governors' messages to the Legislatures which was started in these columns in the issue of Feb. 26 and continued in the issue of March 5 is concluded herewith. The states covered are Pennsylvania, Kansas, Oregon, North Carolina, Iowa and Idaho.

PENNSYLVANIA

According to the message of Gov. John S. Fisher of Pennsylvania, it is the province of government to establish the rules under which the operation of public service companies shall be carried on efficiently, wisely and fairly. He said that in the natural sequence of events utilities developed in advance of governmental regulation. Out of the uncontrolled freedom of the early stages of the business there naturally arose abuses. It was to correct these and prevent their recurrence that instruments for supervision were fashioned by both the nation and the state. Sometimes they were created under strong reactions of popular resentment and were carried to unwise extremes, but in the main their influence has been salutary. Proper regulation, he believes, has proved as beneficial to business as to the public. The Public Service Commission of Pennsylvania was the agency established by the Legislature to deal with public utility problems and should be organized, sustained and equipped to carry out its functions of assuring to the people adequate service at reasonable rates. He believes the construction of the state highway system should be kept moving; while much had been accomplished, much remains to be done. He said that more stringent measures would have to be enacted for the safety of the highways and protection of the people. Uniform traffic regulations were desirable, but in establishing them sight should not be lost of the fact that conditions suitable for one community are not made burdensome for another.

KANSAS

Gov. Ben S. Paulen, in his message to the Legislature, said that the state was confronted by the absolute necessity of better means of transportation. In connection with motor vehicle laws, he called the attention of the Legislature to the uniform motor vehicle code drafted and adopted by the national conference of commissioners on uniform state laws and approved by the American Bar Association. A uniform regulation of motor cars would come sooner or later, he believed, and since the state of Kansas was among the first in the number of cars per capita, it should adopt such regulations as would be for the public interest. On the important question of motor carriers, he believed that legislation should be enacted prescribing the manner in which bus lines operating through a number of taxing districts should be assessed for taxation purposes.

OREGON

The details in connection with the administration of the laws relating to the licensing and regulation of the operation of motor vehicles on the highways of Oregon have now reached such proportions as to necessitate the separation of such duties from the present duties of the Secretary of State. The creation of a separate department of vehicles is desirable. This opinion was expressed by Gov. I. L. Patterson in his address to the Thirty-fourth Legislative Assembly. By vesting the administration department of the motor vehicle laws of the state in an official to be appointed by the Governor control is retained of the important offices that may be appointed, so that in the event that it be desirable at times that they be assigned to other duties necessary in maintaining the peace of the state they may be readily and speedily assigned. He recommended the appeal of that provision of the existing motor vehicle law imposing an additional license fee of 50 per cent on "motor vehicles not common carriers, . . . and used for commercial purposes. . . ."

NORTH CAROLINA

In the interests of safety, Angus W. McLean, Governor, told the General Assembly that the time had arrived when it was necessary to enact a law requiring the registration of persons driving motor vehicles. He would recommend a law which would provide that licenses be issued only after a careful examination as to the character, habits, experience and general fitness of the applicant.

IOWA

The abolition of the valuation department in the office of the Railroad Commission of Iowa was recommended in the inaugural address of John Hamill, Governor. He recommended that it be eliminated, inasmuch as the appraisement of the railroad properties under that department had no actual relation to the fixing of freight rates within the state, and neither was the valuation used in computing rates to be taxed to the railroad companies.

IDAHO

H. C. Baldridge, Governor, in the nineteenth session speech, stressed the advisability of increasing the speed limit of motor vehicles to 25 m.p.h. outside of municipal limits. He recommended and urged the adoption of a uniform motor vehicle registration and certificate of title act, a uniform motor vehicle operators' and chauffeurs' license act, and a uniform act regulating the operation of motor vehicles on highways, this to be in accordance with the report of Herbert Hoover to the second National Conference on Street and Highway Safety.

Traffic Survey of Metropolitan Boston

The City Council of Boston, Mass., has appropriated $25,000 for a comprehensive traffic survey of the metropolitan area under the direction of the Albert Russel Erskine Bureau for Street Traffic Research. The survey is expected to bring order out of the chaos of complex traffic regulations concerning parking, one-way streets, right or left turns, and by its detailed study of traffic movement provide the necessary data for the installation of an efficient system of traffic control. At present Boston's entire signal system consists of one multiple light signal pole operated by an officer from the sidewalk and two multiple light traffic towers operated by an officer from the inside of the towers.

Scientific study will be made of such subjects as causes of congestion, causes of accidents, rules of the road, pedestrian traffic and its protection, organization and operation of traffic police, installation and operation of traffic signals, design and installation of traffic signs and markings, the handling of traffic law violations and parking and garage problems.

The Boston survey is being conducted in co-operation with an advisory board on traffic, appointed by the Mayor, and composed of representatives of city departments, members of the Chamber of Commerce and representatives of all the leading bodies that may be affected by traffic changes to be proposed. It is the fourth metropolitan traffic study made by the Erskine bureau under the direction of Dr. Miller McClintock.

Detroit Men Stimulated to Greater Effort

Gratifying results have followed the intensification during the past few months of the continuous campaign of the Detroit Municipal Railway, Detroit, Mich., in the interests of safety. The total number of accidents reported during January, 1927, was 30 per cent lower than that of January, 1926, and during the first ten days of February only 310 accidents were reported, as against 385 during the corresponding period of the previous month. Should this record be continued during the remainder of February a new low level will have been reached. During this same period one division, operating approximately 20,000 car-miles a day, established the remarkable record of running one entire day without a single accident.

Keen competition has been set up among the eight operating divisions by the presentation of a banner each month to the division showing the greatest reduction in the number of accidents over the preceding month. Then at the end of the year the division that has won the most banners is presented with a beautiful championship pennant. The men of each division are taking a great deal of pride in adorning the walls of their lobbies and recreation rooms with these banners and pennants, hence their zealous effort to avoid accidents.

In addition to this form of competition the trainmen on each division are grouped into teams consisting of twelve men. Each team elects its own captain and in a sportsmanlike manner endeavors to make the best showing on the division in the reduction of accidents.

The number of accidents chargeable to the various teams are charted each day on the bulletin boards at the respective carhouses, thus keeping the teams informed as to the progress during the month. At the end of each month boxes of cigars are distributed to the members that make up the team having the fewest number of accidents on each division.

Summer Course at Harvard for Utility Executives

The Harvard University Summer School, in session from July 5 to Aug. 13, 1927, will include a course on public utility management and economics for public utility executives. Enrolment will be limited to 50 men and application should be made as early as possible to the Harvard Business School, Cambridge, Mass. Information concerning the living arrangements will be sent on request. The tuition is $100. Messrs. Philip Cabot and Deane W. Malott, in charge of the public utilities work in the Harvard Business School, will conduct the course, which is the equivalent of the full winter course offered in that school. Classes will meet daily from 10 to 12 a.m. and from 2 to 3 p.m. At least twenty hours a week preparation outside the classroom will be necessary. The course will require the full time of those enrolled.

Passenger Service Over Houston North Shore Planned

Plans are being made to start passenger service over the Houston North Shore Railway line from Houston to Goose Creek, Tex. This electric railway line, 32.5 miles long, penetrates a territory hitherto without rail facilities. H. K. Johnson, president of the company, reports rails are now laid from Baytown to the Houston city limits. The line represents an outlay of $1,150,000. Application for sale of the property to the Missouri-Pacific Railway is pending, and decision by the Interstate Commerce Commission is expected by April 1. In the meantime passenger service is to be started prior to this date. Four modern interurban cars have been purchased to be put into service, and a schedule of fares based on 85 cents from Houston to Goose Creek, or commuters' tickets for 50 cents, has been announced. A modern electric locomotive capable of drawing 40 loaded cars has also been purchased for service on this line.

Omaha Franchise Election Deferred

The question of granting a new franchise to the Omaha & Council Bluffs Street Railway will not be submitted at the May election in Omaha, Neb. The city attorney filed a number of objections to the draft prepared by the citizens' committee, mostly technical. As it was found impossible to secure an agreement in time to submit the franchise, it has been withdrawn by the citizens' committee, with the permission of the Council.

John Lee Webster, attorney for the company, has long held to the opinion that the company has a perpetual franchise, and he has announced his willingness to try the matter out in court. When the franchise asked by the company and defeated was submitted the company offered to waive the point if an extension were granted. The city voters refused this extension under the terms proposed. The Omaha *Bee* suggests that a judicial determination be secured. If the company has perpetual rights, the Council should know it, and if it has not, "then it cannot weigh them against other concessions in seeking a franchise."

The Guaranty Trust Company, New York, representing the bondholders, recently filed suit in the federal court setting up the claim of a perpetual franchise. Mr. Webster said he would press for an early hearing.

No Segregation for the Present in Albany Case

The Public Service Commission has denied the motion of the city of Albany for an immediate ruling on the question of segregating the Albany zone from the Troy zone when the commission begins the consideration of the application of the United Traction Company for a fare increase. The commission recommended, however, that the communities affected by this application set forth their reasons for or against segregation in the briefs which they will present.

In denying the motion of the city of Albany, the commission stated that the question presented is one which should properly be determined in deciding finally upon the merits of the application made by the railway, and that to decide the question at this time would constitute a prejudgment on the part of the commission of one of the most important questions that will arise in determination of the case.

Chairman Prendergast of the commission announced on March 7 that briefs by the United Traction Company and the various municipalities are to be filed on or before April 1 in the matter of the railway's petition.

Terminal Talk Revived in Watertown

Comparatively little headway has been made to date with the proposal recently presented to the City Council by the Milwaukee Electric Railway & Light Company providing for the expenditure of approximately $100,000 in Watertown for the erection of a modern terminal and train building and the removal of its railway tracks on three streets and part of another. The obstacle which seems to be blocking progress in this improvement program centers around the city's request to have the company share in the cost of the new West Main Street bridge which the city and interurban use to replace the present structure.

In testifying before the Council, Vice-President Jackson of the company said the company did not intend to substitute buses. He suggested that if local conditions required bus service the city should supply it by means of a local operator.

A petition was brought to the attention of the Council signed by 370 people urging that the tracks remain, while 107 persons urge that the tracks be taken up.

Questioned concerning the new terminal, Mr. Jackson declared train buildings would be erected adjacent to the station to permit three interurban cars to load and unload passengers under the roof. All company buses would also use the terminal facilities.

The Story of Baltimore in 1926

Looking back over 1926, the United Railways & Electric Company, Baltimore, Md., has picked some of the things from the routine which it has embodied in a public statement that has been issued. The company says that although the items listed do not present an adequate picture of the task that was faced they suggest the size of the job. The following items are listed:

More than 15 miles of track was entirely reconstructed in 1926, at a cost of about $858,863.

One hundred street cars a month went through the company's paint shop for complete repainting, inside and out.

Twelve new articulated cars were built and put into service, making 34 in all.

10,111,945 more "seat-miles" were furnished. A "seat-mile" is a measure of service—one seat going 1 mile. Or put it this way: street car passengers had seats for 10,111,945 more miles last year than in 1925, which means they had 1,637,173,845 seat-miles, or almost as many seat-miles as Henry Ford has dollars.

225,255,633 revenue passengers were carried, or 1,020,106 more than in 1925.

Of the company's gross revenues of $16,715,709, $10,782,619 went right back into the expense of running the cars.

$1,954,671 more went back into the public treasury in taxes. This was 2⅓ times as much as the stockholders got, which was $818,000.

802,063 more transfer passengers were carried than in 1925.

Of the taxes paid out of carfares, $1,121,000 was park tax for the support of the city's parks.

2,008 public reports and criticisms of service were handled and adjusted as nearly as possible to the satisfaction of the critics.

News Notes

Agreement Made with St. Louis Union.—Mayor Victor J. Miller of St. Louis, Mo., has announced an agreement with the St. Louis street car men's union whereby terms of the service-at-cost franchise now pending before the St. Louis Board of Aldermen will recognize the right of the car workers to unionize and will also restrict the use of one-man cars by the railway. The understanding with Mayor Miller, it is believed, will cause William R. Schneider, attorney for the union and member of the State Legislature, to withdraw the bill he had introduced at Jefferson City for the repeal of the service-at-cost law. It will also result in the railway workers actively supporting the franchise measure when it is presented.

Westchester to Ask State Aid.—The Westchester County Board of Supervisors has voted to ask State Senators and Assemblymen from Westchester to support the proposed legislation which will refer the passenger and commuter traffic problem in New York City and suburban areas to the Port of New York Authority. A report will be made to the Legislature of New York State and of New Jersey. The recommendations will not carry any weight until approved by voters of these sections.

Another Railway After Coffin Award.—The Virginia Electric & Power Company, Richmond, Va., will be a competitor in the national contest for the 1927 Charles A. Coffin award. In seeking this honor the company will emphasize particularly more riders and more revenue; a friendly public fostered by a co-operative spirit; lower costs and increased reliability of service; increased safety for riders; increased co-operation between the management and employees, and financial accomplishments by way of improved investment worth of securities.

Fares Lowered.—The Union Traction Company, Nashville, Tenn., has reduced the fare from Nashville to Gallatin, Tenn., from 92 cents to 75 cents for a single trip. A round-trip rate of $1.25 has been established.

Would Establish Ten-Cent Rate.—The New York State Railways, in a supplemental petition filed with the Public Service Commission, asks permission to establish a new rate of fare of 10 cents between Oneida and Kenwood, instead of the present 8-cent fare, without any reduced rate through the medium of tickets, but with the privilege of a round-trip fare of 15 cents. The petition originally filed asked that the railway be permitted in the city of Oneida to sell three tickets for 25 cents with a cash fare of 10 cents, in place of the present 7-cent fare. A hearing will follow.

Reports for Traffic Study.—Norman D. Wilson, of Wilson, Bunnell & Borgstrom, consulting engineers, Toronto, Ont., is again in Brazil, South America, for the Brazilian Traction, Light & Power Company, Ltd., which controls the traction services in Rio de Janeiro and São Paulo. In 1925 Mr. Wilson reported to the company on the transit and traffic situations in these two cities. It is in connection with his recommendations for a revised franchise and the construction by the city of a short section of surface subway to relieve the traffic difficulties in the Triangle in São Paulo that that city has retained James Dalrymple, former general manager of the Glasgow Tramways.

Tokens for Change.—The use of metal disks or tokens, for change only, has been revived on the Rochester lines of the New York State Railways. The tokens will end the difficulties in making change for passengers and conductors alike. If the passenger has the correct fare, 8 cents, no token will be required. The disks are for use only when the passenger has not the correct fare and he is given a token in lieu of change. The new order does not affect the sale of tickets.

Plan Three-Mile Extension of Service.—Extension of through railway service of the Chicago Surface Lines, Chicago, Ill., for a distance of about 3 miles along Ewing Avenue and Indianapolis Boulevard in South Chicago was ordered on Feb. 16 by the Illinois Commerce Commission. Under present arrangements Chicago Surface Lines cars operate from the downtown Loop district over Cottage Grove and South Chicago Avenues as far as 93d Street only. This extension will give residents of South Chicago a more frequent and more direct service without transfer to downtown Chicago. Except for a new wye at the proposed terminus, no new track will be constructed in connection with the extension of service. Surface Lines cars will be operated over the present tracks of the Hammond, Whiting & East Chicago line, an affiliated company.

Recent Bus Developments

Interstate Service a Subterfuge in This Case

A recent order by the Public Service Commission of Pennsylvania denied the contention of the Highway Motor Coach Company that it does not need a certificate of public convenience from the commission to operate between Harrisburg and other cities and Camden, N. J., because it is doing an interstate business. The commission directed that the company cease operation until it has obtained a certificate.

The Highway Motor Coach Company is a Delaware corporation. Last year it began to carry passengers between Harrisburg and Philadelphia by way of Lebanon, Reading, Pottstown, Norristown, Roxborough, Philadelphia, Camden, thence back to Philadelphia. A month later the company began a similar service between York and Philadelphia. The commission said:

> The extension of the route a short distance in Camden, N. J., is a mere subterfuge or scheme to evade the law. The substance of a transaction is regarded by the law as essential and not the form of the transaction. Attempts made to evade the operation of one law by subterfuge have always been swept aside by courts and commissions. This principle is so well established as to need no citation. The transportation furnished by the respondent under the facts in this case is not interstate within the purview of the decisions of the United States Supreme Court.

Interurban Becomes Iowa's Biggest Bus Operator

The Fort Dodge, Des Moines & Southern Transportation Company, Boone, Iowa, has purchased the Hawkeye Stages, Inc., with headquarters at Des Moines, making the Boone company, which is an auxiliary of the Fort Dodge, Des Moines & Southern Railroad, the largest single bus company of its kind in the State. The Boone company will have 444 miles of additional bus lines and will be operating 30 buses in Iowa more than 125,000 miles each month. C. H. Crooks is president, M. Johnston secretary-treasurer and G. E. Motz manager for the consolidated company. Among the lines will be a continuous one from Oskaloosa to Spencer.

Experiments with New Fageol Twin Coach in Chicago

Trial operation of a new type of motor coach over Diversey Boulevard, Chicago, between Crawford and Laramie Avenues on Feb. 28 was interpreted by residents of that part of the city as an indication that the Chicago Surface Lines is to start motor coach service soon in conjunction with its railway operations. Permission to operate the Diversey Boulevard bus route was granted to the company last November by the Illinois Commerce Commission. The Surface Lines still have 90 days in which to start service.

The new bus, which made the test run over the proposed route last week, was designed and built by the Fageol Twin Coach Company and is being taken on a transcontinental demonstration tour by Frank Fageol, president of the company. It was described and illustrated in the ELECTRIC RAILWAY JOURNAL for Feb. 26, page 381.

Operation of the Diversey Boulevard route and other motor coach lines as extensions to the present railway system is being opposed by the Chicago Motor Coach Company, which has an appeal pending from the order of the commission authorizing the installation of the buses. It is understood, however, that residents along Diversey Boulevard have repeatedly requested the Chicago Surface Lines to provide this service.

Ohio Court Frowns Upon Competitive Service

Bus lines in Ohio have lost a hard fight with the Pennsylvania Railroad in an effort to gain through service linking Columbus, Cincinnati and Cleveland. But according to the decision of the State Supreme Court bus transportation is a means of transportation auxiliary to the existing railway routes when such service is competitive and is not really needed. Nine cases were appealed from the Public Utilities Commission, and the higher court declared that neither the commission nor the bus companies running these shorter lines acted discreetly in transferring certificates of operation assigned to them to the Buckeye Company, which has vested power of the consolidated lines. The railroad charged the service company with "an intent deliberately to compete with their system to its prejudice." The transfers have thus been nullified and the cases referred back to the commission with the following interpretation of the law:

> An application to amend the tariff and schedule of one or each of two certified motor transportation routes, authorized to be separated as separate routes, so as to convert the service of such routes from local service between their respective terminals to a through service between the outside terminal of the two routes, is in effect an application for a new route, and must be made under Section 614-91, General Code, and publication must be made and notices served as provided in that section. And before an order can issue granting such service, the Public Utilities Commission must find that the public convenience and necessity require it.

Bills asking for more liberal treatment of operators who seek bus operating rights are still under consideration by the Ohio General Assembly.

Suit Involving Purple Swan Dismissed

The suit of the Seiberling Rubber Company, Akron, Ohio, against the Purple Swan Safety Coach Lines, Inc., for rental due on tires used by the bus company was dismissed by Circuit Judge Moses M. Hartmann of St. Louis, Mo., on Feb. 28 upon the filing of a stipulation by counsel that the dispute had been adjusted. Some of the Purple Swan lines were operated in competition with the Blue Goose line run by the East St. Louis & Suburban Railway. The stipulation indicates that the bus company paid $9,500 in cash and executed demand notes for $7,142 in favor of the Seiberling company in the settlement of the claim.

When the Seiberling company brought its action on Dec. 27, last, Judge Hartmann appointed a temporary receiver for the bus lines, but the receivership was terminated within three days when the Purple Swan Company filed a bond with the court to protect the plaintiff should the court determine that the coach lines owed the amounts claimed.

Coach Losses Concern Cincinnati

An Outline of President Draper's Proposal to the City Administration in Regard to Bus Losses—Railway Has No Monopoly of This Class of Service

IN A FORMAL report to E. D. Gilman, director of the Department of Public Utilities of the city of Cincinnati, Walter A. Draper, president of the Cincinnati Street Railway, has outlined a procedure for the reduction of losses on the operation of the motor coaches of his company. This operation has shown deficits averaging $14,000 each month over the nine months of its life. As losses have been absorbed in the profits of the street cars, a seemingly unfair situation exists.

The Cincinnati Street Railway does not have a monopoly in providing municipal transportation in Cincinnati. Independent bus lines have secured short routes through thickly populated sections of the city already served by railway lines. On the other hand, the railway, which was delayed in entering the motor coach field by extended franchise negotiations, operates the runs to remote suburbs and the crosstown lines. In several instances the railway established routes where independent lines had failed.

Of the three classes of motor coach service rendered by the railway, namely, lines radiating from the center of the city, crosstown lines and feeder lines, the first comes nearest to paying its way, while there is less real need for it than the two other classes of service.

Mr. Draper answers the question, Why the motor coach operation of his company loses money when independent companies apparently make a profit, as follows:

> It can easily be seen that if independent lines do make a profit it is because, being free to choose at the beginning, the operators of these lines selected routes where the business would pay best. These routes were mainly along existing lines of travel and were and are reasonably short routes. Having the street cars at hand to take care of the rush-hour riding morning and evening, the independents have to provide very little if any additional service, and it is this rush-hour service, requiring investment and the maintenance of equipment which is used for so short a time, that is the most costly to give. The independent lines, moreover, do not issue transfers.
>
> The motor coach lines of the railway were put on where service was needed or where it was thought motor coaches could supply a different class of service. Those of our lines that follow the same routes as street cars are, with one exception, long lines that run express service designed to accommodate the long rider, which again is the more costly service. The other lines either connect parts of the city and other intersecting car and coach lines or supply remote sections with a form of feeder service.

The next logical question, Why not discontinue the service, is answered by Mr. Draper:

> The answer to this question is found largely in the answer to the other question, that the major parts of the service given by this company was put on because it was hoped it might serve a useful purpose and the same thing that makes some of it lose money; that is, remoteness of territory served, is in itself the reason why the service is needed. Giving a service that is not duplicative or competitive, these lines, therefore, should not be discontinued merely because they lose money. It is the measure of the loss that should govern. This principle has been recognized as sound by state law, which provides that service shall be extended or continued by a public utility even though it be given at a loss, providing this loss is not great enough to affect the results of the entire operation of the utility to the extent that there will not be a reasonable return on the investment and that there will not be an impairment of the service as a whole. The test of profitableness alone should not be applied to determine whether the service on the two cross-town lines of the company or the Mount Airy (feeder) line should be discontinued. The test of individual profitableness, if applied to some of the existing rail lines, would require their discontinuance, manifestly an absurdity. The Mount Airy line gives service to a part of Cincinnati that has no other public transportation facilities. It was begun at the request of the city after the independent operator had found it unprofitable and discontinued operations, but the loss from this line is not so great but that the system as a whole can afford to carry it.
>
> It certainly must be clear that there is something fundamentally wrong if independent operators can select the profitable routes and this company must operate the unprofitable routes, with the consequence that the rest of the system must stand the losses. The only conclusion is that unified operation is the logical and economical basis for a city-wide public transportation system.

Mr. Draper's remedies do not include discontinuance of any lines at this time. The changes he suggests are:

> 1. Bring the fare limit on two of the routes which run from the city to distant suburbs closer to the city, charging 10 cents to the nearest point and 5 cents additional to any point beyond. Also reduce fare on outer end of these routes to attract riding for short distances in the outer zone.
> 2. Change the route of one line, running it through a more thickly populated section.
> 3. Discontinue express service except during rush hours on one other poor paying route so that a full load may be assured. This gives the opportunity of picking up passengers all the way into the city.
> 4. If these first three steps do not lessen losses sufficiently after a reasonable trial, alter the transfer privilege; either charge 5 cents for transfers except to cross-town lines, or eliminate them entirely.
> 5. Reduce the amount charged to depreciation after the end of the first year.

Mr. Draper concludes that after trying these measures there would still be left the expedient of increasing all motor coach fares. His idea is that if after the experiment were made that has been outlined such a step were found necessary, the traveling public could certainly find no fault with such a move and it would be in line with the tendency observed in other cities toward a higher class or de luxe service on the motor coach, with a corresponding higher rate of fare. Further Mr. Draper said:

> Finally, in case it is found necessary, consideration should be given to the discontinuance of the poorest paying line or lines. While I would regret the necessity of discontinuing any line, it might have to be done in fairness to the rest of the system, and the motor coaches now operating on such discontinued line or lines could better be used for additional service elsewhere, especially on the two cross-town lines during the morning and evening rush hours.
>
> I am aware that the trial of these various steps will consume time, but I am not yet willing to say that motor coach service in Cincinnati has cost the transportation system as a whole so much as to cause us to become panicky or to be driven to hasty action. It is true that the motor coach is not as popular, at least in Cincinnati, as it once was, and the necessity of protecting the existing rail car system for the great mass of people is apparent, but there is a place in a unified transportation system for all forms of transportation that can demonstrate their lasting qualities. Being charged with the responsibility and obligation of providing such a unified system, we cannot neglect to adopt any reasonable form of transportation that the public desires and is willing to pay for.

Bus Experiment in Residential District.—Further expansion of the bus system of the Rochester, N. Y., lines of the New York State Railways was marked March 7 with the opening of service on an experimental line in Ridgeway Avenue, residential north side section. Railway Commissioner Charles R. Barnes announced the buses would operate only during the rush hours until the traffic showed that patronage would be sufficient to warrant full time service. The service was installed on the appeal of residents.

Hearing on Proposed Specifications Applying to Buses.—The street transportation department of the Board of Public Utility Commissioners of New Jersey has submitted to the board proposed specifications applying to buses of the "city type, single-deck" and "parlor car type," which it is recommended shall take the place of the specifications adopted by the board on Dec. 29, 1924. The board will hold a hearing on the matter in Newark, N. J., on March 23, 1927, upon the question whether the specifications so submitted shall be adopted and fixed as just and reasonable regulations to be observed and followed by the operators of buses of these types.

Milwaukee Railway Opposes New Operators.—Competition between the Milwaukee Electric Railway & Light Company and the American Coach lines for business on the North Milwaukee and the Wauwatosa routes and the intercity route to Green Bay advanced a step when the American line announced that fares would be reduced ranging from 16⅔ per cent on city and suburban lines and 20 per cent on intercity routes. Metal tokens will be introduced so that passengers on the North Milwaukee and the Wauwatosa routes can purchase twelve 10-cent tokens, eight 15-cent tokens and six 20-cent tokens for $1. This makes a reduction of 16⅔ per cent on these fares when tokens are used. On the route between Green Bay and Milwaukee the revised fare will hereafter be $3.50 instead of $4.25. Fares to intermediate points will be similarly reduced. The Milwaukee Electric Railway & Light Company complained on the ground that this area was adequately served by its own facilities.

Financial and Corporate

Receivership Action Likely for Auburn & Syracuse Railroad

Receivership proceedings are anticipated in the case of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., which operates in Syracuse and also a suburban line connecting Auburn and Syracuse. A statement by the company said:

> Having defaulted interest due April 1 and Oct. 1, 1926, a bondholders' protective committee was formed. Within a short time the Equitable Trust Company, New York City, which is trustee under the mortgage, will probably seek foreclosure. The natural conclusion of that will be the asking for the appointment of a receiver. Figures show the continual loss to be almost entirely due to use of privately owned automobiles.

The outstanding mortgage bonds of the company amount to $1,752,000 with annual interest charges of $87,600. The losses increased from $16,031.71 in 1924 to $87,684.34 in 1926.

Increase in Passengers Carried in Winnipeg

The Winnipeg Electric Company, Winnipeg, Man., carried 57,985,144 revenue passengers in 1926. This represented a 5 per cent increase over 1925. The year 1920 established a record for the company and each succeeding year up to 1925 showed a decrease from the preceding year. The following table shows the trend:

1920	65,248,840
1921	61,515,325
1922	60,399,419
1923	58,253,356
1924	55,077,901
1925	55,096,058
1926	57,985,144

Texas Tax Relief Bill Before Governor for Signature

Repeal of the gross receipts tax on interurbans and other electric railways in Texas was put up to the Governor on March 2 when the Senate finally passed the Kemble House bill. Senator Witt of McLennan, sponsoring the measure, declared that the Texas Electric Railway had not paid dividends on preferred stock in twelve months, despite the fact that it is the second largest taxpayer in McLennan County. He urged that repealing the gross receipts tax would leave the school, road and other taxes and place the electric railways on the same plane with other industries.

Engineers Public Service Reports Good Year

Large increases in consolidated gross and net earnings are shown by the Engineers Public Service Company, New York, N. Y., in its annual report for 1926, issued recently to stockholders. Gross earnings were $26,627,687, an increase of $3,518,750 over the previous year, and the balance available for reserves and the 778,938 outstanding shares of Engineers common stock increased 25.9 per cent to $3,183,879. The report gives several detail analyses, including capitalization totaling $4.92 per $1 of gross, maintenance expenditures amounting to 9 per cent of gross and reserves and surplus equaling 72 per cent of annual gross earnings. The company reports, in addition to the acquisition of the Baton Rouge Electric Company, net increases in plant of its subsidiaries totaling $15,077,000 and the reinvestment of $3,391,455 of earnings in the properties.

The Engineers Public Service Company controls subsidiaries operated under executive management of Stone & Webster. The subsidiaries serve a population of 1,176,100. The increased earnings of the El Paso, Savannah and Key West properties reflect the healthy growth of industry in the territories served. The total number of stockholders is 8,800, an increase of 35 per cent in the last ten months.

Cincinnati Has Good Year

Substantial Increase in Passengers Handled—Progress Made in Rehabilitation of Property—President Draper's Remarks Abstracted at Length

TAKING everything into consideration, the results of the first year's operation of the Cincinnati Street Railway, Cincinnati, Ohio, since that company resumed control on Nov. 1, 1925, are not disappointing. This was the substance of the opening remarks of Walter A. Draper, president, at the recent annual meeting of the stockholders. He said the year had been one of readjustment and rehabilitation after the several years of negotiations between the city and the companies, during which time it was impossible for the then operating company to do many of the things desirable and needful in the interest of the public and stockholders. The budget filed with the city of Cincinnati on Dec. 1, 1925, covering estimated results of operations for the year 1926, indicated a deficiency for the year of $72,848, without including any estimate for the operation of the motor coaches, which were at that time not a part of the company's business. The actual results for the year 1926 show a surplus of $14,064 above all requirements, including dividends on stock and interest on notes, despite losses from motor coaches, and despite the much larger operating charge for track reconstruction than was anticipated when the budget was filed.

EARNINGS OF CINCINNATI STREET RAILWAY

	1926	Jan. 1–Oct. 31, 1925	Nov. 1–Dec. 31, 1925	Total Year 1925
Railway operating revenue	$8,102,517	$7,558,322	$1,242,269	$8,800,592
Railway operating expenses	5,846,221	4,469,590	847,858	5,317,448
Net operating revenue	$2,256,295	$3,088,732	$394,411	$3,483,143
Taxes assignable to railway operations	708,831	625,290	123,369	748,660
Gross income	$1,547,463	$2,463,441	$271,042	$2,734,483
Rentals	25,150	1,030,232	16,675	1,046,908
Balance	$1,522,313	$1,433,208	$254,366	$1,687,575
Interest and sinking fund on bonds and notes	332,885	585,305	58,941	644,246
Surplus	$1,189,428	$847,903	$195,425	$1,043,329
Deficiencies from 1924 allowed to be earned and paid	....	521,905	....	521,905
Balance	$1,189,428	$325,997	$195,425	$521,423
Allowance for return on capital	1,175,364	347,043	188,652	535,695
Balance	$14,064	*$21,045	$6,773	*$14,272
Franchise tax	....	296,989	....	296,989
Deficiency or surplus	$14,064	*$318,034	$6,773	*$311,261

*Denotes deficiencies.

The essential feature of the present operating plan is that if the revenues are sufficient to pay all requirements, including operating costs, taxes and return on capital, and still produce a balance the city has the right, through its control of operations, to determine how this balance shall be applied, namely, to bring the property to an improved operating condition, to increase the service or to add to the fare control fund, so as to bring about a reduction in the rate of fare when that fund is increased from the initial amount of $400,000 to $600,000. Similarly, if necessary expenditures for maintenance, operation, taxes and return on capital exceed the revenues, the deficit must be made good out of the fare control fund until it is reduced to $200,000, when fares automatically increase. Into this fare control fund balances were paid from each month's operation for the period from Nov. 1, 1925, to Dec. 31, 1926, with the exception of July and August, when payments out of the fund were required to be made to meet deficits. The net amount added to the fund was $6,774 for the last two months of 1925, and $14,064 for the twelve months of 1926, or a total of $20,837.

Mr. Draper said that in comparing the results of operation for the year 1926 with the preceding year it was necessary to have in mind that a 10-cent fare was in effect on cars for the first ten months of 1925, as against the 8⅓-cent ticket rate and 10-cent cash rate in effect for the last two months of 1925 and the twelve months of 1926; that motor coach operation began in April, 1926, chiefly on a 10-cent fare, and that the different corporate and financial set-up in effect up to Nov. 1, 1925, required larger rentals, interest, sinking fund and return on capital. Instead of the large rental figure of 1925, which this company received from the lessee at the rate of 6 per cent on its stock, there was the return on capital in 1926 at the rate of 5 per cent, and the smaller rental that was paid for the first three months of 1926 to the former Cincinnati & Hamilton Traction Company. The large balance for the twelve months of 1925 was required and was available for the payment of past deficiencies created in previous years when the receipts from fares were not sufficient to meet requirements, including the former city franchise tax.

RECORD OF PASSENGERS CARRIED IN CINCINNATI

	1926	1925	1924	1923	1922	1921
Revenue Passengers:						
Cars	89,493,159	90,629,875	100,839,343	108,625,599	107,528,666	106,527,759
Coaches	4,104,586	....	....	....	....	....
Total revenue passengers	93,597,745	90,629,875	100,839,343	108,625,599	107,528,666	106,527,759
Transfer Passengers:						
Cars	29,480,811	30,832,130	32,706,502	34,066,858	34,765,044	34,904,917
Coaches	768,711	....	....	....	....	....
Free Passengers:						
Cars	1,465,811	1,309,845	1,319,318	1,292,290	1,399,018	1,527,297
Total, all passengers	125,313,068	122,771,850	134,865,163	143,984,747	143,692,728	142,959,973

The tendency toward a decrease in passengers carried on cars, which became quite marked in the spring of 1925 and was checked in the fall of that year, has now been overcome and, while the total number of passengers carried in 1926 was fewer than the total in 1925, the latter months of the year show a considerable increase over the similar month of the year preceding. This tendency toward an increase in passengers riding the cars is in the face of an increase in the number of automobiles in Cincinnati and the development of better roads.

On the subject of bus operation, he said that the company now had in daily service 62 motor coaches on ten lines. Four of these lines operated from outlying sections to the heart of the city, running chiefly express where paralleling car lines; two were crosstown lines, connecting up many radiating rail and motor coach lines, and three were feeder lines. He said that it was scarcely to be expected that they could be continued at as great a loss as had been experienced. As the rate of fare on motor coaches was fixed and not dedendent upon their cost of operation, and as the deficit from their operation must be assumed by the railway, they thus contributed to the cost of carrying passengers on street cars, and it was possible that a continued or an increasing loss, he claimed, from operating motor coaches might eventually result in an increase in the fare on cars. On the other hand, he claimed, there should not be a too hasty condemnation of buses because the lines did not all show a profit. Some that were losing were rendering a service that parts of the city needed. He referred to the two crosstown motor coach lines rendering a distinct service for which rail service might otherwise be required at a greater cost to that particular territory than the present coach lines. He said that it was apparent that the public desired motor coach service not instead of but supplementary and in some cases in addition to rail lines. Independent motor coach operations which cut into the previous operating company's revenues so sharply during the year 1925 did not offer at this time the menace that they formerly did.

He answered the question of why motor coach service of the company was operated at a loss, while at least some of the independent lines claimed to show a profit by saying that the independents at the start, being unregulated, picked choice routes, generally short ones, in thickly settled sections and in most part on the same streets with existing rail lines where they were assured of loads. The routes operated by the company, he stated, include several to remote and thinly settled sections that no independent could be induced to serve. It was recognized, he said, that a unified and co-ordinated city transportation system was the most logical and satisfactory plan for serving the public. It was clear that if the profitable motor coach routes operated independently were a part of the whole transportation system they would tend to offset the loss from the needed but unprofitable lines.

The total amount expended for replacement and renewal of track and overhead construction in 1926, in addition to ordinary maintenance and repairs, was $523,367. Of this amount $451,994 was provided by the special depreciation reserve fund, $36,373 was paid for out of receipts and charged directly to operating expenses during the year and $35,000 was paid with funds borrowed for the purpose, which will be charged out and repaid at a later date. The purchase of new equipment had been deferred until the track over which it should operate could be put in better condition. Work had been done, however, on improving the condition of existing rolling stock and increasing the degree of comfort and convenience. Even a larger program for 1927 has been agreed upon after conferences with the chairman of the highways committee of Council and the city manager, amounting to nearly 140,000 ft., or approximately 26 miles of single track. Additions and betterments to the property of the company from Nov. 1, 1925, to Dec. 31, 1926, cost $970,299. Similar expenditures in 1927 will not exceed $2,000,000.

Mr. Draper referred to the rapid transit lines as a problem confronting the city as a whole; its ultimate disposition was the question. Surveys and studies already made clearly indicated that the line could not and should not be operated except as a part of a unified city-wide system. The immediate hope for the line lay in the possibility of its taking enough traffic on its rails to reduce the service required on the surface rails and to relieve traffic on congested streets to warrant its construction and operation. The future hope for the line lay in the fact that it would doubtless improve the value of the territory through which it ran, a large part of which had now been little developed.

He referred to the valuation of the property and the long-drawn out negotiations, which finally resulted in an agreement with the city fixing the capital value on Nov. 1, 1925, at $27,000,000, plus $1,000,000 for the Mill Creek Valley lines.

He said that the recognition of the mutuality of interests of the company and city, or of the car rider and the taxpayer, under the present plan of city control of the transportation system was clearly appreciated by the city administration and was evidenced by the co-operative efforts of city and company to facilitate this important work; the new year had been entered upon with confidence and a sincere effort was being made by the officials of the company to carry to the public of Cincinnati the message that the company was endeavoring to live up to its responsibility for providing public city transportation service of satisfactory character. According to him, it could be safely said without prejudice there were evidences of progress in Cincinnati that not only would be advantageous to all enterprises, but would also require the furnishing of increasing facilities by the company.

Suburban Line Does Well

Net Income of Chicago & West Towns Railway Has Practically Doubled Since 1920

The Chicago & West Towns Railway, Oak Park, Ill., has, during the last seven years, established its ability to show good earnings and has widened considerably the margin by which interest charges on its bonded indebtedness have been earned. Both gross earnings and the net income available for interest on funded debt have increased without exception in each year since 1920, the net having practically doubled in that time, rising from $177,331 in 1920 to $349,269 in the year just ended.

A comparison of the gross earnings, the net income and the bond interest charges for each year of the last seven follows:

Yr. Ended Dec. 31	Gross Earnings	Net Income Available Bond Int.	Bond Int.
1926	$1,441,083	$349,269	$105,000
1925	1,348,902	317,563	105,000
1924	1,273,702	287,546	91,961
1923	1,208,218	274,032	80,500
1922	1,132,427	242,683	69,250
1921	1,108,618	222,491	68,000
1920	1,000,096	177,331	62,333

Net income as available for bond interest is before provision for amortization of bonds or for depreciation.

Present interest charges on the funded debt have been covered on the average 2.55 times in the seven-year period from 1920 to 1926. In 1925 these charges were covered 3.02 times and in 1926, 3.33 times. The actual amounts paid as bond interest prior to 1924 are not significant in calculating the average number of times charges were earned, as from 1922 to 1924 the full amount of bonds now outstanding had not been sold, and prior to 1922 an issue with a lower rate of interest was in the hands of the public.

Capitalization of the Chicago & West Towns Railway consists of $1,500,000 of first mortgage 7 per cent bonds due on July 1, 1932; $1,000,000 of 6 per cent cumulative first preferred stock; $210,000 of 8 per cent cumulative second preferred, and $1,000,000 of common stock. The financial strength of the company is further indicated by the fact that dividends have been regularly paid on both issues of the preferred stock since its issuance. Dividends have been paid on the common stock at the rate of 6 per cent per annum since Jan. 1, 1926.

The first 7s of 1932 are a direct first and only mortgage on the entire property of the company. Additional bonds may be issued to the extent of 75 per cent of the cost of new construction, if earnings for the twelve preceding months have been equal to twice the interest requirements on the total bonds issued and to be issued.

The Dec. 31, 1926, balance sheet showed a property account totaling $4,528,340, compared with $4,347,447 at the 1925 year end, the fixed assets at the close of 1926 being equal to slightly more than $3,000 for each $1,000 bond outstanding. Against the property account there is a depreciation reserve of $672,160, additions to this reserve averaging about $60,000 annually. Working capital position at the 1926 year end was not particularly favorable, current assets totaling $106,309 with current liabilities, which included the reserve for taxes of $67,681, amounting to $124,772. Weakening of the working capital position during the year is accounted for by additions to the property account. The company is entitled to issue bonds to reimburse its treasury for the expenditures to property account. The amount that may be issued under the terms of the trust deed for these expenditures as of Dec. 31, 1926, is $350,000.

The Chicago & West Towns Railway serves a suburban territory lying directly to the west and southwest of Chicago which has experienced a particularly rapid growth during the last five years. A total of 73 miles of electric railway lines are operated in the villages of Oak Park, River Forest, Maywood, Cicero, La Grange, Forest Park, Lyons, Berwyn, Proviso, Riverside, Clyde, Hawthorne and others. The greater part of the power requirements are purchased from the Sanitary District of Chicago, two generating stations being maintained, however, as standby stations. Franchises in the communities served are of varying lengths, and with one exception, i.e. the village of Forest Park, franchises extend beyond the maturity date of the bonds.

Would Sell Railway.—Mayor William E. Westbrook of Ogdensburg, N. Y., has announced that he will sell the rolling stock and property of the Ogdenburg Street Railway at public auction because of delinquent payments on paving assessments. The company has made no formal announcement of its plans except for a statement declaring it has until 1935 to pay the assessments under the law. It is understood, however, that steps will be taken to prevent the sale.

Dividend Payment Reduced by Twin City.—Directors of the Twin Cities Rapid Transit, Minneapolis, Minn., have declared a quarterly dividend of $1 per share on the common stock, payable April 1 to holders of record March 15. In 1926 the company paid four quarterly dividends, each of 1¼ per cent.

New Board Member Elected.—At the annual meeting of the directors of the Columbus Railway, Power & Light Company, held in Columbus, Ohio, recently, John S. Brookes was elected to the board. He replaces John Kelly of Columbus.

Denver Tramway Reduces Debt.—The funded debt of the Denver Tramway, Denver, Col., is to be reduced through refinancing. The first mortgage 6 per cent gold bonds and the first mortgage improvement 6 per cent gold bonds, due on April 1, totaling $2,598,000, will be acquired by the company from the holders, and are to be extended to Oct. 1, 1933. The bonds are to be deposited as collateral for a new issue of $1,750,000 Denver Tramway 6 per cent first underlying mortgage collateral trust sinking fund gold notes, maturing on Oct. 1, 1933.

Interurban May Discontinue.—Officials of the Pennsylvia-Ohio Electric Company are considering plans to terminate interurban railway service between Niles and Mineral Ridge, near Youngstown, Ohio. The company has continued service for some time at a loss, but officials consider it an imposition to be asked to share the cost of a new bridge in Niles over which the lines must run. R. N. Graham, manager of railways, so declared at a conference with Councilmen at Niles. Residents at Mineral Ridge say this is the only way hundreds of workingmen have of reaching their places of business.

Denies Abandonment Approval.—The Public Service Commission on March 8 denied the application of the Hudson Valley Railway, Glens Falls, N. Y., to abandon its lines between Lake George and Warrensburg and between Thomson and Greenwich. The commission in its summation of the case said the petitioner had not made a clear and satisfactory argument as to its financial inability to carry on successfully the operation of the Greenwich branch and that there existed a real public demand for the continuation of that branch. Also that there was a public need for the service in Warrensburg and that the Lake George-Warrensburg branch financial loss was not satisfactorily proved.

Acquisition Offsets Loss from Abandonment.—The Illinois Northern Utilities Company for the year ended Dec. 31, 1926, reports a net income of $828,739 after interest, amortization, taxes, retirement reserves and all other charges, equal after dividends on the preferred and junior preferred stock to $12 a share on $4,535,000 of common stock. This compares with a net income of $655,731, or $8.41 a share, on $4,885,000 common stock in 1925. During the year recently ended the company reacquired $700,000 of its common stock from the Middle West Utilities Company to offset the property loss resulting from the abandonment of the Sterling, Dixon & Eastern Railway. This enabled the company to take out of its fixed capital account the investment carried in the Sterling, Dixon & Eastern property, according to Martin J. Insull, president. The company had 4,458 stockholders at the end of 1926.

Two New Directors Elected.—George G. Shaw and P. H. Worman were elected directors of the City Railway, Dayton, Ohio, at the meeting of the stockholders on Feb. 10.

Carhouse Property Sold.—The carhouse property of the Alabama Traction Company at Decatur, Ala., has been acquired by the Cooper-Wells Company, operating the hoisery mill. The property lies adjacent to the hosiery mill and provides ample space for whatever expansion may be necessary in the future. The property was first acquired by the city of Decatur, which, ratifying the action of the Albany Council, took it over in settlement of claims against the railway.

Increase in Capital Value Asked in Youngstown. — Request that capital value of the Youngstown Municipal Railway, Youngstown, Ohio, be increased $55,953 is pending in the City Council. The increase, according to Harry Engle, street railway commissioner, is for improvements installed at the Mahoning Avenue garage, where the company's city buses are housed and kept in running condition. Of this amount $25,679 is for the installation of five 20,500-gal. gasoline tanks and one 20,500-gal. oil tank. The rest, $30,273, was used to purchase and install modern machine shop equipment.

Merger of Reorganized Roads Arranged.—Announcement has been made of the merging of Ohio and Indiana corporations under the single title of the Fort Wayne, Van Wert & Lima Traction Company. Officers and members of the board of directors are: Henry C. Paul, president; Frank H. Cutshall, treasurer, and James W. Barrett, secretary, all of Fort Wayne, Ind.; J. C. Neff, Philadelphia, and D. P. Abercrombie, Boston. The merged company is the successor after reorganization of properties previously existing.

Eight Parts of Line to Be Abandoned.—The Public Service Commission approved declarations of abandonment by the Empire State Railroad Corporation of eight parts of its line in Oswego, N. Y. The city is planning to give consents for the operation of bus lines to provide transportation service in the city. Evidence showed a gradual decline in patronage of the Oswego line within the past five years, the losses in gross revenues after payment of operating expenses being, in 1926, $24,423, in 1925, $18,786, and in 1924, $10,628. It was further shown that after paying operating expenses, taxes and interest, the railroad had a deficit of $59,968 in 1926 Revenue passengers on the Oswego City lines declined from 1,223,368 in 1923 to 947,620 in 1926.

Book Reviews

Main Street and Wall Street

By William Z. Ripley, Boston, Mass.: Little, Brown & Company. 353 pages. Price $2.50.

Books are seldom what the blurbs on their jackets purport them to be. In this case, however, Professor Ripley has in some of his caustic comments quite lived up to the claim made for it that his book is a startling exposé of present-day financial methods. Of one entrancing picture drawn of the banker's function in industry he said:

"This busy 'organization capital' bee, 'with honeyed thigh,' in Milton's words, buzzes from one flowery situation to another, extracting the precious nectar of control and just incidentally powdering the public with the preferred pollen."

As for Professor Ripley, he appears to be no dispenser of pollen at all, either preferred or common. One of the things at which this gallant Knight who has essayed the task of self-appointed censor does tilt, is the issuance of no-par stock, which he says cuts the ground from under any attempt to correlate closely the amount of the investment and a stated par value for the securities. He does admit, however, that, like most things on earth, human beings particularly, no-par stock is not altogether bad. According to the penetrating professor, the issuance of securities in this form does embody a useful principle, just as to him Coca-Cola sounded refreshing until he delved into the company's financial structure. He is not apparently against all holding corporations. He says even the holding company may benefit from a proper amount of articulation, but that such company need not be a vaudeville contortionist for all that.

And so the comment runs through the more than 350 pages, made up among other things of reprints of his articles "Stop, Look and Listen!" and "More Light!—and Power Too," both of which were the subject of comment in the ELECTRIC RAILWAY JOURNAL at the time of their appearance in the *Atlantic Monthly*. The chapter "More Light—and Power Too" is directed at the light and power industry, but some of his strictures apply equally well to cases in the railway field. It should not be assumed that all he says is condemnatory. That is not the fact. The professor sees many things that, in his opinion, need correcting and many tendencies appear to him to be fraught with danger, but he also sees any number of practices that are worthy of emulation.

Some of the matters upon which he touches are the complicated holding company structures, the lack of uniformity in legislation covering incorporation, the disposition of some holding companies to venture into far-off fields, the possible abuse of banker control, the frailties of some customer-ownership plans, the iniquity of recent sales of some properties at prices that might be regarded as inordinate, the inadequacy of some depreciation reserves, and kindred subjects.

Many of the points the professor raises have been raised before, and nowhere more than in the industry itself are some of the problems receiving more careful attention. The matter of simplification of corporate structure is now before the industry as a burning issue. During the war many expedients were called into play in order to preserve the *status quo*, or to preserve it as nearly as possible. Now that this emergency has passed, voluntary readjustment and simplification of corporate structure are taking place on an extended scale. Even the professor is cognizant of this tendency, for he himself cites several instances of it.

As for customer ownership, all the evils are inherent in it which the professor names. Utilities are cognizant of them. The report of the public service securities committee of the Investment Bankers' Association presented at the annual convention, Oct. 11 to 15, 1926, shows the extent to which some of the other subjects mentioned by the professor are receiving the serious attention of the investment bankers. All this is not said with the idea of mitigating the criticisms contained in this chapter. No industry should be so squeamish about its doings as not to accept with good grace suggestions from a source so well informed.

In concluding his preface the professor pays his respects to a host of persons to whom he is indebted, and then says that the only possible reparation will be that, despite its manifest shortcomings, the volume shall stimulate discussion and inquiry. And then, apparently as an afterthought, this professor, who himself is a master of cajolery, mordant humor, invective, just plain foolery and much common sense, adds: "That it may bring forth fruit in due season is my most earnest wish." He has certainly lived to see that wish fulfilled, and to find himself the recipient of a considerable quantity of fruit, some of it overripe, if it wasn't actually putrid.

Electric Power Stations

By L. W. W. Morrow, managing editor *Electrical World*. New York: McGraw-Hill Book Company. 326 pages. Price $4.

This work is a sound discussion of the fundamental principles of production, transmission and distribution of electrical energy on a large scale in an economical manner. The book covers such topics as plant sites and their layout, coal oil and gas—their use in electric power stations, steam, auxiliary energy supply, boiler room, turbines, electrical equipment and switching. Throughout the book emphasis is placed on principles underlying the selection of proper equipment for specific conditions and on the methods of utilizing this equipment to best advantage.

Primer of Simplified Practices

By United States Department of Commerce.

Growing out of a concerted movement on the part of producers, distributors and consumers in co-operation with the Department of Commerce a primer of simplified practices in production has just been issued. The primary object of the book is to eliminate needless variety in sizes, dimensions and types of commonplace articles to the end that production cost may be decreased while the utility and efficiency of production are enhanced.

Higher returns to the worker, savings to the consumer, greater productivity, enlarged general purchasing power and more intelligent use of our natural resources, resulting in benefits to the entire nation, are cited as some of the advantages to be gained through simplified practice.

This simple and effective method of attacking waste differs from standardization in that it tends only to the elimination of odd sizes of products in small demand. It does not interfere with fashions or styles.

The co-operative trend of the times shows that there are many features in a large proportion of commonplace articles in which attempted individuality is superficial and useless, and stands in the way of their broader use. "For instance," the primer says, "twenty years ago there were 180 different sizes and styles of electric lamp bases. The common base which is used today has been a factor in increasing the use of electricity for lighting purposes, yet there are other features of the electric lamp which retain their individuality."

The history of the simplification movement is a record of constant abandonment of the fallacy that widely diverse or "odd sizes" tend to secure competitive advantages. The passing of this misconception had led to a point where today industries as a whole are very generally competing with other industries through simplification to broaden markets and induce the widest possible consumption of their products.

Under the procedure of the Division of Simplified Practice, each simplified practice recommendation must be accepted by producers, distributors and consumers representing 80 per cent of the annual volume of the industry, it being believed that only such a proportion of acceptance will insure general application and adoption. The division has no police power to enforce simplified practice recommendations nor does it desire any. The government offers its services merely as an effective agency in bringing together business groups on a neutral ground. The final recommendations as to the elimination of sizes, styles and types of articles is the job of the industry itself and the adherence to such recommendations is left entirely to the business group interested. A representative standing committee is appointed at the general conference to serve as a liaison between the Department of Commerce and the industry, and upon which devolves the duties of promoting and supporting findings of the conferees, as well as conducting annual resurveys to ascertain the degree of adherence and convene to effect revisions, or reaffirmations.

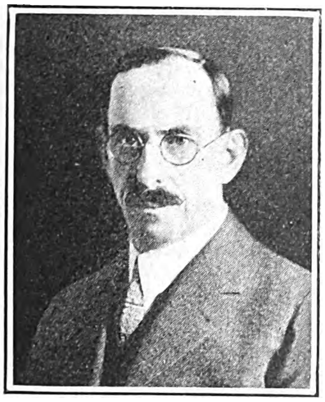
Personal Items

Changes on Interstate

Advancement of Officials, Announced Recently, Has Gone Into Effect—Mr. Van Arsdel Succeeds Mr. Reid

Important changes in the personnel of the Interstate Public Service Company, Indianapolis, Ind., were announced recently by Harry Reid at a dinner given at the Columbia Club in his behalf by his associates in the Indianapolis office of the company.

As stated previously in the ELECTRIC RAILWAY JOURNAL, Mr. Reid has been named president of the National Electric Power Company, New York City. He has been giving most of his time to his new position for some time and stated that at the annual meeting of the stockholders of the Interstate on March 7 the following changes in the personnel of the Interstate would be made:



E. Van Arsdel

E. Van Arsdel, who has been vice-president of the Interstate for eight years, will become president.

I. L. Oppenheimer, who has been with the Interstate for six years, as assistant to Vice-President Van Arsdel, will become vice-president in charge of the operation of the electric, gas and water properties.

L. M. Brown, who has been general manager of the railway of the Interstate between Indianapolis and Louisville for several years, will become vice-president in charge of all railway operations for the company.

W. Marshall Dale, who came to the Interstate about two years ago from the Kentucky Utilities Company, will become vice-president and treasurer in charge of the finances.

A. D. Jones will become vice-president and auditor in charge of the accounting and stores.

G. J. Oglebay, who has been manager of the Bedford district for several years, will become assistant to Vice-President Oppenheimer, in charge of the gas, electric light and water properties.

While the sentiment expressed at the dinner indicated much regret at Mr. Reid's departure from Indianapolis, it also was evident that his associates feel great pleasure in his elevation to the management of a property of such large scope as the National Electric Power Company, one of the large units of the Insull organization operating gas, electric, water and railway properties in twelve states. Mr. Reid has succeeded Albert Emanuel of New York as president of the National Electric Power Company, Samuel Insull succeeds Victor Emanuel as chairman of the company.

Mr. Reid went to the Interstate in January, 1917. He was elected president and general manager within a short time thereafter and under his direction the Interstate has grown, not only as one of the largest utilities in Indiana, but in the good graces and good will of the people in the many communities it serves.

Mr. Van Arsdel is well known and highly esteemed by the men and women with whom he has been associated in the company. He is a native of Kentucky and went to Indianapolis in March, 1917. He was operating manager of the Interstate for a year, following which he became its vice-president. He was vice-president of the Kentucky Utilities Company at the time of his appointment as a member of the Interstate organization. Mr. Van Arsdel was with Mr. Reid at Louisville for five years in the operation of the Kentucky Utilities Company properties.

At the dinner at which the changes in personnel were announced Mr. Van Arsdel, on behalf of the employees and executives in the Indianapolis office, presented to Mr. Reid a beautiful center piece of Kirk silver and two beautiful silver candlesticks of the same design. Mr. Reid's associates also presented to him a marble desk set inlaid with gold.

As for the other employees Mr. Rockefeller has been transferred from the Connersville district to the Bedford district as local manager. For the past three years he has been manager of the Connersville district and prior to this he was located at Aurora for a period of nine years in the same capacity.

Fifteen years service with one organization is Mr. Oglebay's record. During the past eight years he has been located at Bedford, Ind., in the capacity of local district manager. Effective on Feb. 1, he joined the Indianapolis organization as assistant in the operation of electric, gas and water utilities.

Mr. Large will succeed Mr. Rockefeller as district manager at Connersville, Ind. Prior to this transfer, he was district superintendent at Oakland City, Ind., and he has been associated with the Interstate for a period of three years.

W. R. Power Heads Kentucky Association

W. R. Power, general manager of the Ohio Valley Electric Railway, Huntington, W. Va., was elected president of the Kentucky Association of Public Utilities at its meeting in Louisville on Feb. 18-19.

Early in his career Mr. Power went with the General Electric Company, Schenectady, in the testing department. In the fall of 1903 he joined the American Railways on the Chicago & Joliet Electric Railway property at Joliet, Ill. A year later he was transferred to one of its Pennsylvania properties and in 1912 was transferred to Huntington, W. Va., on another property of the same company. Five years later Mr. Power was made general manager of the Consolidated Light, Heat & Power Company and affiliated companies in that district, consisting of the railway and lighting companies at Ashland, Ky., and Ironton, Ohio. The holding company was taken over three years ago by the American Gas & Electric Company and is now known as the Appalachian Electric Power Company, Huntington district.

W. R. Power

It was with P. H. Chase, chief electrical engineer for the American Railways, that Mr. Power demonstrated in 1921 the possibility of inspecting high-tension lines by airplane. The demonstration was made in a new Curtis "Oriole" with Bob Shank, a local aviator at Huntington, as pilot. A distance of 25 miles and return was covered in the flight. The line inspected was being constructed by the Virginia Power Company from Cabin Creek, in Kanawha County, to Huntington. It was said in the April 9, 1921, issue of ELECTRIC RAILWAY JOURNAL that both Mr. Chase and Mr. Power had found the plan workable.

Mr. Power was reared in Kansas. His education included special courses at the University of Illinois.

Glasgow Tramway Appointments

Following on the appointment of Lachlan McKinnon to be general manager of Glasgow Corporation Tramways, Glasgow, Scotland, in succession to James Dalrymple, retired, the tramways committee has approved the following recommendations submitted by the general manager: James N. Wilson, secretary and treasurer of the department, to be deputy general manager; Robert F. Smith, accountant, to be traffic superintendent; and G. W. Alexander, principal assistant to Mr. Smith, to be accountant for the railway department.

All of the officers so named have for many years been in the service of the corporation. Mr. Wilson will continue to hold the office of secretary and treasurer.

North Shore Line Appoints New Officers

Reorganization of the transportation department and changes in divisional limits of the Chicago, North Shore & Milwaukee Railroad to facilitate train operation were made known recently with the announcement of ten new appointments by General Manager John F. Egolf. All of the new appointees are under the supervision of J. W. Simons, general superintendent of transportation.

Chester K. Thomas, director of service improvement, has been named division superintendent of the Main Line Division, in charge of all train operation between Harvard Street, Chicago, and Austin Avenue, Milwaukee, including the Mundelein-Lake Bluff service.

William Burke has been appointed superintendent of the Milwaukee Division, with supervision of all traffic operating between Austin Avenue and Sixth and Clybourn Streets, Milwaukee.

Charles Cawley and John J. Dee have been named superintendent and assistant superintendent, respectively, of the Chicago Division, between 61st Street and Harvard Street, in the city of Chicago.

George C. Kenry is appointed superintendent in charge of all train and motor coach operation in the city of Waukegan and on the Shore Line Division between North Chicago Junction and Waukegan.

George Bernard has been appointed conductor instructor.

D. A. Miner has been named motorman instructor with supervision over all divisions. In addition thereto he assumes the duties of trainmaster.

George Merriman, S. M. Carrell and William Ives are appointed trainmasters with supervision over train operation of the Chicago, North Shore & Milwaukee Railroad between Chicago and Milwaukee, and Lake Bluff and Mundelein.

Jasper C. Johnson, formerly superintendent of operations of the main line division of the Shore Line Motor Coach Company, has been appointed assistant general manager. Mr. Johnson's headquarters will be at Michigan City, Ind.

F. M. Plake of the valuation engineering force of the Missouri Public Service Commission has been named chief valuation engineer to succeed James L. Harrop, resigned. Mr. Plake has been with the commission for four years. Prior to that time he served with the Interstate Commerce Commission.

Obituary

Dudley Farrand

Dudley Farrand, identified with the electric light and power industry for many years and vice-president of the Public Service Corporation of New Jersey, died on March 3 at Fair Haven, N. J., in his 59th year. He started his career as a clerk with the Newark Electric Light & Power Company and after two years of service he was made assistant secretary. He was next made assistant manager and subsequently he was placed in charge of design and construction. After an association with the People's Light & Power Company, during which he was assistant general manager and general manager, he became general manager of the United Electric Company of New Jersey, and four years later he obtained a similar position with the electric department of the Public Service Corporation of New Jersey.

On the formation of the Public Service Electric Company in 1910 to take over all the electric properties of the Public Service Corporation Mr. Farrand was appointed its general manager. Five years later he was made its vice-president and general manager, assuming in addition the duties of assistant to the president in 1917. Mr. Farrand was president of the National Electric Light Association in 1907 and the following year was appointed by President Roosevelt as technical adviser representing the electrical interests to the National Conservation Commission.

George J. Baldwin

George J. Baldwin died at the Johns Hopkins Hospital, Baltimore, Md., from pneumonia, on March 5. No truer eulogy can be written for this great organizer of public utilities throughout the South than to say he spent the major part of his 70 years in serving the interests of philanthropy and in helping to create power in industrial life. Mr. Baldwin, a partner in Stone & Webster since 1898, under which company these organizations were formed, had also been vice-president and general manager since 1916 of the American International Corporation, founded during that same year to extend and cement the foreign financial and commercial relations of the United States.

Upon graduating from the Massachusetts Institute of Technology in 1887, his activities increased and progressed first from chemist at the Woodstock Iron Company, Anniston, Ala., to superintendent of the Bradley Gold Mine Company of Nacoochee, Ga. He resigned from the mine company after a year of service to join the Baldwin Company, cotton factors and dealers in fertilizers. In 1886 he founded the Baldwin Fertilizer Company, of which he was president until 1894. As a member of the firm of Stone & Webster, with which he aligned himself four years later, he organized the following companies, being at one time or another president of all of them: Savannah Electric Company, Jacksonville Traction Company, Key West Electric Company and Pensacola Electric Company. Mr. Baldwin at one time also was first vice-president of the Pacific Mail Steamship Company and acted as chairman of the New York Shipbuilding Corporation.

James W. Samuel

James W. Samuel, former assistant treasurer of the United Railways, St. Louis, Mo., died in his home in that city on Feb. 17, following a long period of ill health. He had been relieved of his duties as assistant secretary and treasurer of the company by Receiver Rollo Wells in 1920. At that time Mr. Samuel, 40 years old, had been in the employ of the railway for about 25 years. He started as a clerk and occupied in turn many important positions with the company. For many years he was chief clerk in the office of the treasurer and in 1916 was elected to the office of assistant treasurer and secretary.

In filling that position he supervised the counting and banking of all money taken in on the cars, issued and registered the capital stock of the company, collected bills and looked after the rental of buildings. He also kept records of all insurance policies of the company. At the age of 16 he served as general utility boy in the employ of the old Lindell Railway. This was in August, 1895. When the Lindell was consolidated with the other systems of St. Louis Mr. Adkins, former treasurer of the old Lindell lines, became secretary and treasurer of the United Railways. Mr. Samuel continued then in Mr. Adkins' office. Mr. Samuel was 48 years old.

John Stopp, for several years general shop foreman at the carhouse of the Tri-City Railway, Rock Island, Ill., died recently. He started service with the Tri-City property 35 years ago as a motorman. Mr. Stopp was 58 years old.

Joe C. Thompson, secretary and assistant treasurer of the Texas Power & Light Company, Dallas, Tex., died at Dallas on Feb. 28. Mr. Thompson was also tax commissioner for the Texas Power & Light Company, Dallas Power & Light Company, Dallas Railway & Terminal Company and the Texas Electric Railway, Inc. He had been connected with these companies since 1913 and had lived in Dallas for 25 years. Mr. Thompson was 52 years of age.

John R. McGinley, an organizer of the Philadelphia Company, of which he was vice-president and general manager for many years, died in New York City recently. Mr. McGinley, a prominent figure in the industrial world, was an early associate of George Westinghouse, with whom he formed the Westinghouse Electric & Manufacturing Company, and with whom he was associated for many years in the Westinghouse Air Brake Company. He was actively identified with many industrial and financial institutions of Pittsburgh and elsewhere, among them the Fidelity Title & Trust Company, the Duff Manufacturing Company, Chicago Pneumatic Tool Company, Union Switch & Signal Company and the R. D. Nuttall Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Coffin Awards Made to General Electric Employees

Twenty-seven employees of the General Electric Company were awarded Charles A. Coffin Foundation certificates of merit for their outstanding services toward the increase of the company's efficiency or progress in the electrical art during 1926. The awards were made March 4. With each certificate went four shares of General Electric common stock. One-third of the twenty-seven awards were to workmen, two to foremen, eight to engineers, five to commercial men and three to administrative employees.

The Charles A. Coffin Foundation, which makes the awards, was created by the General Electric Company in 1922 in recognition of the services to the electrical industry of the late Charles A. Coffin, first president of the company, who died last summer. The awards of the foundation include, in addition to those to General Electric employees, yearly prizes in the electric railway and power fields and a number of annual fellowships in American universities.

Work Begun on Twin City's New Noiseless Cars

Construction has begun in the St. Paul shops of the Twin City Rapid Transit Company, Minneapolis, Minn., of 25 noiseless cars provided for in the company's 1927 budget, which has been accepted by the Minneapolis City Council. These are to weigh 1,000 lb. more than the trial cars that have been in service two or more years, providing for more structural strength, but 10,000 lb. less than the standard car in use. The cars will cost $155,000, of which 60 per cent will be charged to the Minneapolis division and the rest to the St. Paul City Railway. Aluminum is utilized considerably in the structure of the cars. With the use of a new type of wheels and brakes and through other features the car noise is reduced to a minimum, from the viewpoint of modern engineering.

Chicago, Aurora & Elgin Railroad to Build New Terminal

Plans for the construction of a new passenger terminal at Aurora, Ill., have been announced by the Chicago, Aurora & Elgin Railroad. Acquisition of a new right-of-way extending several blocks along the Fox River and of an entire business block at Broadway and New York Street has been completed by the company and construction of a $60,000 terminal station will be begun at once. Extension of the city's principal business district one block south along Broadway is expected to result from the railroad's undertaking.

In all, more than 10 acres of land has been purchased by the company and the total cost, including terminal construction, is said to be approximately $1,000,000. The new terminal and new right-of-way will make it possible for the Aurora-Elgin line to discharge passengers in the heart of Aurora without running its trains over the street car tracks of the Aurora, Elgin & Fox River Electric Company on Broadway as at present.

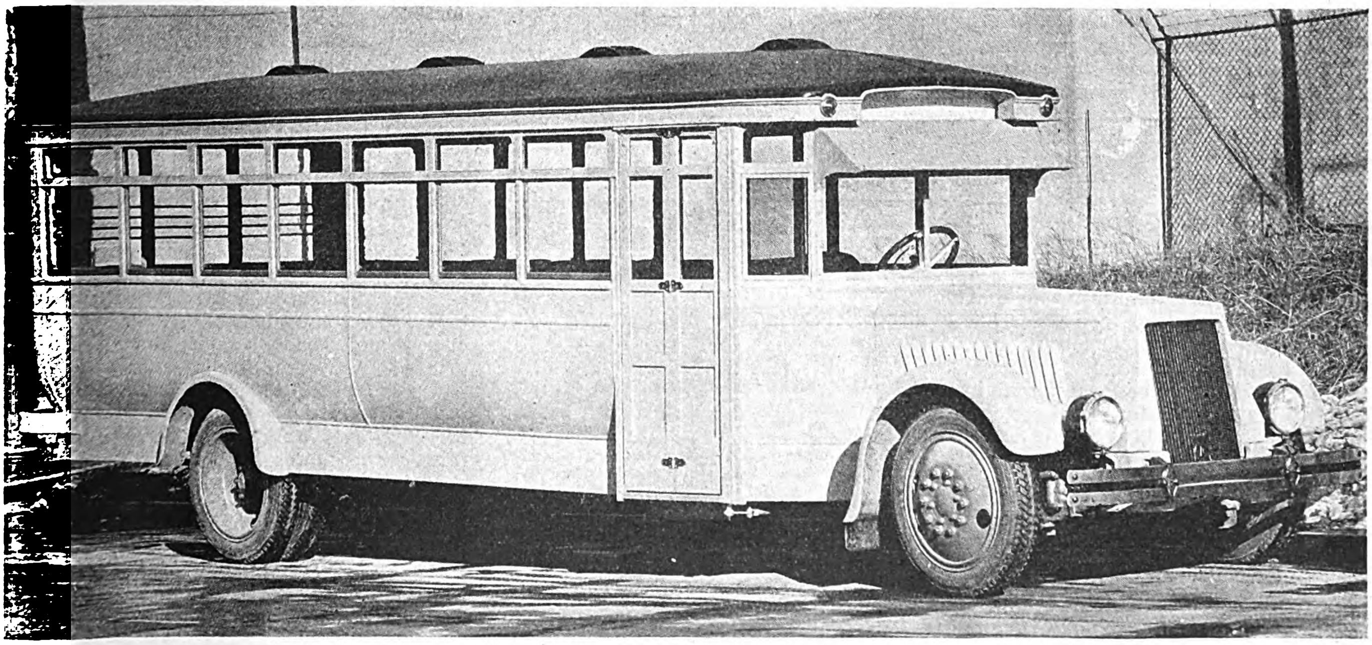
The Aurora terminal is part of a comprehensive plan of improvement started by the railroad since its purchase by Samuel Insull and associates early in 1926. A new $250,000 terminal is now under construction at Wells Street, Chicago, and extensive improvements are being made in the roadbed and rolling stock.

Some Details of New Jersey Company's New Macks

Additional facts are available about the 77 Mack buses recently ordered from Mack Trucks, Inc., for use on the lines of the Public Service Transportation Company, Newark, N. J., and twenty by the Capitol District Transportation Company (United Traction Company), Albany, N. Y. Thirty-seven of the buses ordered by the Public Service Corporation are gas-electric drive, as are the twenty ordered by the Capitol District Company. Forty ordered by the Public Service are mechanical drive Macks. All buses are of the six-cylinder type as shown in the accompanying illustration. The Public Service Company also purchased at the same time 70 four-cylinder, gas-electric drive Macks, bringing the total order up to 147 buses.

The six-cylinder Macks are equipped with genuine leather-upholstered seats, and have a capacity of 29 passengers, sitting. The engine, radiator, gasoline tank, steering wheel, transmission and entire chassis are mounted on blocks of live rubber under compression. This system of rubber suspension is known as rubber shock insulation, as these rubber blocks damp out vibration so that an increase in bus life and passenger comfort is obtained.

In the gas-electric drive buses, an electric generator is connected with the gasoline engine, and then through a control box with an electric motor. Only one electric motor is used and this is connected directly to the standard Mack driveshaft. It is claimed that the single motor drive eliminates several hundred pounds weight,



Mack Six-Cylinder Gas-Electric Bus of the Type Ordered for Use in Newark, N. J., and Albany, N. Y.

extra maintenance and extra cost which must be calculated in gas-electric drive buses using two motors. Speed in the gas-electric drive bus is controlled by acceleration of the gasoline engine.

Bertin Heads Galena Signal Oil

M. J. A. Bertin was recently elected president of the Galena Signal Oil Company, following his election as a director during the annual meeting of the company. Mr. Bertin succeeds L. G. Drake, who resigned as president and director. F. A. Burgess is another director elected at the annual meeting, succeeding C. W. Hochette. At a subsequent meeting of the directorate J. French Miller was named as treasurer, in place of William P. Westcott.

Triplex Car Studied for Use in Montreal

It is understood that the order for the new cars and trailers for the Montreal Tramways, Montreal, Que., will not be placed until a decision on the desirability of the new type of triplex car has been ascertained.

For the present, according to the Montreal Tramways Commission, no more one-man cars are in prospect. The original 50 placed in operation were designed to give more adequate service on certain routes, and not with the idea that future equipment would be entirely of this model.

Inquiry has been made as to whether consideration has been given to double-deckers for Montreal. The matter has not been studied to the bottom, but the responsible operating officials at Montreal are said not to be much impressed with such a model for employment in a climate where, in winter, ventilation is of paramount importance.

As indicated in the ELECTRIC RAILWAY JOURNAL for Feb. 26, page 403, the order at Montreal is for 50 cars.

The Westinghouse Advertising Policy

Much misunderstanding has developed over the recent newspaper stories concerning the announcement on the part of the Westinghouse Electric & Manufacturing Company to use daily newspaper advertising. Certain newspapers used the news story that was sent out in such a way as to make it appear that no other media might be used.

The Westinghouse company is giving up all general magazine advertising, feeling that it can handle institutional advertising and certain product advertising through concentration in localities as conditions demand. The newspaper space will not be used for highly technical apparatus, but primarily for apparatus that is sold through dealers and jobbers. For instance, it might run a campaign on street lighting in a certain city where it was known that thought is being given to a new street lighting system. It was felt that such a situation is primarily of local interest, and that in this, as in many phases of the company's general advertising, newspapers furnish a more effective medium than do general magazines.

An article in the March 10 issue of *Printers' Ink* by J. C. McQuiston, director of publicity of the Westinghouse company, clarifies the situation. In it he makes this statement: "The technical and trade press advertising in our opinion is absolutely as essential to our welfare in the future as it has been in the past."

Track and Line

Miami, Fla.—Application was made recently for the extension of railway service to Cocoanut Grove by W. T. Price in behalf of the residents of the territory involved. The plan contemplates a spur line from the Coral Gables Rapid Transit route. The estimated cost was placed at approximately $166,000 for 3.4 miles of track.

Connecticut Company, through N. J. Scott, manager of the Hartford division, has announced plans for new track construction and changes on the Rockville, Hartford & Stafford Springs line. The track department will install a switch at the Burke Farm, Rockville, another at Tolland Avenue, and will replace the switch at Ogden's Corner. These improvements will permit cars to make the trip between Tolland Avenue, Rockville, and Hartford in about one hour and fifteen minutes.

Shops and Buildings

Department of Street Railways, Detroit, Mich., has a program under way which contemplates the sale of some of its carhouse property and the erection of buildings elsewhere. Legal objections having been overcome, the street railway commissioners have empowered the department of street railways to readvertise for bids on its property on Woodward Avenue across from the Highland Park plant at the Ford Motor Company. The property, no longer needed for carhouses, has a frontage of 125 ft. on Woodward Avenue and is 517 ft. deep. At the time it was previously offered for sale, a bid of $525,000 was received. The sale was halted when it was discovered that the charter requires a vote of the people to dispose of real estate involving more than 10 cents per capita of population. Since then the charter has been amended to read 30 cents. The City Council has voted to approve the expenditure by the department of street railways of $280,000 for 20 acres of land on Coolidge Highway near Grand River Avenue, as a carhouse site.

Metal, Coal and Material Prices

Metals—New York	Mar. 8, 1927
Copper, electrolytic, cents per lb	13.15
Copper wire, cents per lb	15.25
Lead, cents per lb	7.65
Zinc, cents per lb	7.10
Tin, Straits, cents per lb	70.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	2.625
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.70
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.77

Trade Notes

John Alden Plimpton was appointed Western manager of the Pennsylvania Crusher Company, Philadelphia, Pa., effective Feb. 1. Mr. Plimpton's office will be in Chicago. He succeeds B. S. Darling, who has undertaken association work. Mr. Plimpton is a graduate of the Massachusetts Institute of Technology, and prior to his promotion was sales engineer at the company's Pittsburgh office.

Wiswell Improved Railroad Crossing Company, Chicago, Ill., reports the election of the following gentlemen as officers and directors of the company. The personnel was elected at the annual meeting held on Jan. 26. Officers: C. T. Wiswell, president; T. G. Murray, vice-president and chairman of board; C. P. Jaeger, secretary and treasurer; L. C. Larson, sales manager. Directors: T. G. Murray, president Association of Commerce and Merchants, Madison, Wis.; Charles O'Neill, vice-president Bank of Wisconsin, Madison, Wis.; H. V. Tennant, consulting engineer, Portage, Wis.; G. T. Wiswell, civil engineer, Chicago, Ill.; J. A. Lorimer, merchant, Chicago, Ill.; C. P. Jaeger, business man, Madison, Wis., and W. E. Hanson, construction engineer, Chicago, Ill.

New Advertising Literature

Chausse Oil Burner Company, Elkhart, Ind., is issuing catalog No. 11 descriptive of the Chausse portable asphalt plant and other equipment for repairing asphalt pavements. The catalog is well illustrated and in addition to covering details of the portable plant has information and cuts descriptive of the Chausse railway switch heater.

Ohio Brass Company, Mansfield, Ohio, has issued an attractive map of the United States which is after the general design of "Ye Olde" mariner's chart. Within the borders of each state is shown a cut or design of some product of the company that is of outstanding significance to the specific territory.

Amtorg Trading Corporation has just issued an elaborate commercial compendium of the United States, containing 1,076 pages with 2,800 illustrations. The "Catalog of American Industry and Trade," as it is styled, is printed in Russian and is especially designed to place American business before every business and trade executive in the Soviet union. Six hundred and forty-three pages of American advertising contain the insertions of 382 manufacturers of 30 states of the Union and of Canada. The catalog is handsomely bound and, in addition to presenting the claim and operations of the American industries, has interesting articles, contributed by noted engineers and business men. An economic survey of the United States is included.

Annual Maintenance and Construction Number

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, March 19, 1927 *Number* 12

Maintenance from the Car Rider's Viewpoint

WHAT concern of the car rider is the maintenance practice of his street car line? What does he care about the workings of the motors, the trolley, the track? Why worry whether the car that carries him is a light-weight type or a heavy one? Certainly if the rider pays any particular attention to these things he is different from the average man. But when he decides whether to ride the street cars or to buy a new flivver, he considers, even without realizing it, that perhaps the cars are habitually dirty; that there have been frequent delays because of road failures; that the flat wheels have left him tired at the end of a half-hour ride; that the lights flicker so that he cannot read the evening paper. Perhaps his wife tore a new dress because a nail protruded from the car seat, or a spot of oil from a door engine dropped on his new fedora as he left the car on the way to the theater. These are the possibilities to indicate how the car rider is affected by the maintenance of the system.

Let the maintenance man put himself in the position of the man who is to be attracted or repelled. Let him determine if he would ride the cars if he had to pay fare. Then have him go back to his job and try to put his part of the system in such good condition that the average citizen will be pleased to become a regular rider. That is maintenance from the car rider's viewpoint.

Well-maintained rolling stock reflects the company's own estimate of itself.

Smooth, Quiet Operation Results from Good Workmanship

EVERY ONE realizes that quiet running cars are needed and that a high standard of maintenance is necessary to do away with excessive noise. Campaigns for noise reduction are producing good results, and the various maintenance departments show an alertness and eagerness along this line never before manifested.

Better maintenance will permit smoother operation and make it easier to maintain schedules. An open-circuited resistor or a governor out of adjustment may cause jerky acceleration and annoying stops. The passenger usually blames the operator for this, but the real reason is poor maintenance.

The men responsible for the condition of electric railway equipment are really the foundation that must support any campaign for improved equipment. Success in attracting riders and keeping them satisfied depends on the efficiency of the maintenance departments. All other sales effort and publicity to produce increased patronage will fail if cars are dirty and ill-kept, if the track is rough and out of alignment, or if trolley wire breaks and wheels off the wire cause annoying interruptions to service.

Avoid the folly of the broken trolley—inspect the overhead before it gets under foot.

Care Is Important for the Electrical System

NO PART of an electric railway is more vital than the electrical system. Practically 100 per cent service is an absolute essential. Other parts may fail, causing local delays or inconvenience, but breakdown of the electrical system may easily affect a large territory, so that extraordinary efforts should be and are constantly made to prevent failure.

The generation of power is no longer a matter of direct concern to many railways. Its purchase, frequently from large interconnected systems of such diverse territory that failure of the primary source of power is infrequent, is supplanting generation for railway purposes alone. Increased reliability in the substation has been secured by improvements in conversion equipment, particularly for use on 60-cycle systems, while the tendency toward simplification and increased efficiency by use of the mercury arc rectifier is receiving careful consideration.

Development of automatic protective apparatus for use in the substation and on the line has not only reduced the time required for the isolation of overloaded or defective sections and decreased the probability of interruption of other than the affected circuit, but has provided for the automatic restoration of service at the instant that conditions become normal. Remote supervisory control has made it possible for the load dispatcher at a central point to keep in continuous touch with the entire system and to perform necessary switching operations in distant unattended stations with greater facility and certainty than was formerly possible with operators at each place.

The transmission, distribution and trolley contact lines have also received consideration. Insulating materials are constantly being improved, and the results of intensive research are being applied to the insulation of cables for high voltages. The trolley wire material, its manufacture and use are all being carefully studied in the desire to secure a more perfect electrical system.

Unfortunately not all electric railways have modern equipment throughout, though the electrical system may include some or all of the features previously mentioned. In all cases, however, there are two requisites for satisfactory service, namely, thorough inspection and judicious maintenance. Good construction alone is not enough. There must be periodic and thorough inspection to eliminate possible sources of delay before a breakdown actually occurs. In many instances inspection must be supplemented by tests, to determine conditions accurately. The frequency with which inspection and tests are necessary varies for different parts of the system. Some require daily attention, others need it less frequently; but regularity is essential.

Incoming material should be closely watched so that its acceptability and quality are known before installation. The scrap pile cannot be overlooked for ideas, as an inspection of worn-out parts often points the way to improvements.

The importance of thorough inspection combined with judicious maintenance cannot be overestimated. Worn materials must be replaced before failure, but economy dictates the necessity of getting all possible wear before replacement. To secure a proper balance between these two conflicting requirements makes necessary the use of good judgment all along the line, by the superintendent, by the inspector and by the foreman and workmen directly responsible for the maintenance of the system.

The repair job that is "cheap" is not the least expensive in the long run.

Preventive Maintenance Is Better than Repairs After Failure

MAINTENANCE of the highest type includes cars well painted, which are kept immaculately clean, with no loose parts to cause disagreeable noises, and lubricated so that smooth running results. For a short period such maintenance will cost more per car-mile than slipshod work, but in the long run, considering both maintenance and depreciation of the equipment, it will be the cheaper. From the revenue viewpoint the better maintained car certainly will attract more riders and the increased earning power will more than pay for the high standard of maintenance.

Most car maintenance work can be classified under five general headings. These are (1) work needed to keep the car clean, attractive and noiseless; (2) inspection and adjustment; (3) repairs and replacements of worn parts to anticipate and forestall failure; (4) repair of failures; (5) repairs to equipment damaged in operation.

The far-reaching influence of the first class of maintenance, that necessary to keep the equipment attractive, is often overlooked. Many master mechanics know that when it appears advisable to reduce maintenance expense, this class of work is the first one in the budget to be cut, as officials consider that the cars will still operate satisfactorily even though their appearance is not of the high class desired.

The items of car cleaning, painting and lubrication represent a relatively small part of maintenance costs and the savings from neglecting any of these will be comparatively small. It certainly does not pay to cut down expenditures for these three items. In analyzing average figures for several large railway systems, it was found that car cleaning constitutes approximately 15 per cent of the total maintenance cost. Car painting, done on a yearly basis, was approximately 12 per cent of the total and the cost of both labor and material for lubrication was less than 3 per cent of the total. The systems included in the analysis pride themselves particularly on having attractive cars, but still the total expenditure for the three items enumerated is less than one-third of total maintenance cost.

Why give the passenger a soft seat and trust him to a rough motorman?

Cutting Costs at the Source

NO PROGRAM of maintenance-cost reduction can be fully or even largely successful unless the co-operation of the working force can be secured. This co-operation is necessary for conservation of materials, and even more for conservation of time. It involves two elements; desire to keep down maintenance costs, and knowledge of the equipment and its use far beyond the range of the particular job. It appears therefore that here is a problem of management which for its solution involves education. First comes education in loyalty and co-operation; on this a superstructure of information can be reared.

Maintenance costs can be most effectively minimized by careful, that is, intelligent, handling of equipment. This is especially needed, for example, with the modern, light-weight, ventilated motor. A manufacturer's expert, called in for consultation in connection with an epidemic of motor failures, soon correctly diagnosed the trouble as due to frequent and unnecessary reversal of motors in braking. A campaign of education stopped the trouble. Similarly, motormen sometimes "fan" the control so as to "inch the car along" when following another car or other vehicle.

These illustrations suggest but one of many ways in which maintenance can be made to approach the irreducible minimum, that is the amount which is involved in unpreventable wear-and-tear. Then in the actual maintenance work there are other opportunities. First, because most obvious, is elimination of waste in the use of materials. Reclamation of worn equipment and other parts is responsible for large economies and has still further possibilities; always, however, understanding that repair work can be carried too far. To a limited extent also there is actual loss or misuse of material; this can be obviated with a little care.

Important as materials conservation is, however, time conservation is still more important. Labor loss is the more subtle, more difficult to discern and measure—and yet labor is the largest part of maintenance cost. Good supervision will control this loss to some extent, but without the will to save and knowledge of how to do it the worker will waste time, inadvertently or otherwise.

No magic formula can be invoked. But an overwhelming majority of electric railway workers want to help the management cut maintenance costs. They positively will welcome information and suggestions. They want to be taken into partnership in performing this task of management. Much can be done along the line of education through departmental conferences, and where a railway has a comprehensive educational and training program in operation, cutting maintenance costs may well be one objective in laying out the courses. Competition is also an incentive; such, for example, as is furnished by the increasingly popular interchange of maintenance cost data among properties. The first requisite in all of this, however, is a conviction on the part of somebody that the worker is the ultimate source of considerable maintenance cost, hence offers an opportunity for stopping certain leaks at their source.

Paint your rolling stock or you won't need any rolling stock to paint.

Paint Artistically If Possible, but Paint Anyway!

SIR JOSHUA REYNOLDS' famous remark to one of his questioners that he mixed his paint with brains is one that the electric railways may well ponder. Many of them are doing this very thing, but some of them are not. Ordinary pigments include, among others, umbers, siennas, ochres, chromes, Venetian red, Indian red, Prussian blue, and Vandyke brown, but it is the combination of colors that counts. Thus it may seem a long jump from Pliny explaining the term "catagrapha" and Epictetus decorating a vase to the modern car painter, but to both of them the vehicle is still the liquid in which the particles of the base are held in suspension. Age may stale only slightly the infinite variety of the subject of the master, but age and abrasions do detract from the work of the master car painter. The true artist may wince at a combination of yellow and bright red, but these colors make for visibility.

The slatternly-looking vehicle certainly has no place in the present scheme of things. And in eradicating it, paint can be made to play an important part. This is so because the modern methods of painting have made it possible. Isn't it significant that on one railway system the cost of repainting a double-truck car at the present time is $69 with labor at 58 cents an hour —a cost considerably lower than that of 1913, although labor and materials doubled in cost meanwhile? Isn't it also significant that on another system, by improved methods, the number of revenue cars painted annually has been increased from 34 per cent of the total operated in 1920 to 82 per cent in 1925, while the man-hours required for painting a 40-ft. double-truck car have been cut from 340 in 1920, with hand labor, to 90.9 in 1925 with spray and hand labor?

The answer, it seems, is not in the economy itself, but in the opportunity which that economy affords for more work of the same kind to be done at the same gross expenditure. But no matter what the cost, it is the color combination that counts. And there again the advice of Sir Joshua holds good. The tangerine that would do in one place might not do at all in another. Of course, the taste of the public cannot be trusted implicitly, but the railways in Atlanta and Kansas City appear to have fared well by permitting their public to express its ideas about the matter. The members of an art institute might not approve of looking upon traffic, made up for a goodly part of street cars, when they are bright red. This would seem to be just as well. The flaming interurban that can be heard a mile away, to put the matter in the vernacular, may be all right when isolated, as it usually is, but a multitude of such cars on a city system would be more than sensitive souls could endure. A maroon that is permitted to become a screaming scarlet would probably not receive acclaim at the hands of the art critics. It is all a matter of taste, durability and cost, and not the least important of these is the esthetic side of the matter. Of that it might be said *fiat lux.*

Interurban Stations Often a Poor Advertisement

WHAT a dismal picture some interurban stations present! A two-by-four shack, open on one side; a dirt floor and rotting sills that struggle to keep the cinder ballast from washing away. Look at the walls. They are the victims of every pocket-knife owner, and what is far worse, those traveling Michelangelos with a flair for the obscene and lewd. Often they are the last resting place for the dodger of a Fourth of July excursion which raises the ire of the commuter when snow is a foot or two deep outside.

Turn the mental film and view a terminal station of the average interurban. Often it is a reconstructed building. It is poorly lighted, furnished with hard benches, its toilets are unsanitary, cuspidors of the iron age adorn its smoking rooms, it is cleaned with a lick and a promise. It is cold in winter and hot in summer. It is a sardonic joke on the company's publicity claims.

Yet the wayside station and the terminal building are the gateways to the utility—the portals to service, that no matter how well advertised or maintained, suffers immeasurably by their unkempt appearance. Poorly maintained way stations are often the point of the wedge for community antagonism. They are monuments of indifference to what the public considers essential to its comfort. Ten minutes in a leaky, unkempt way station has bred many a bitter enemy.

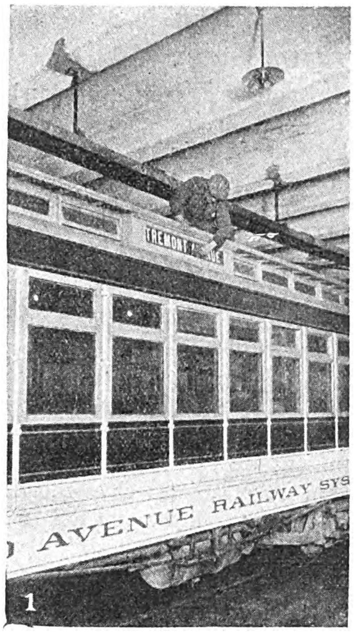
There is a certain likeness between an attractive street car running on bad track and a Rolls-Royce running on a flat.

Many Station Improvements Can Be Made at Little Cost

ON THE other hand, let's square off and look at the whole problem of the possibilities available for interurban station improvement in the light of a few simple maintenance kinks. That the way structure be adequately protected and habitable in all kinds of weather is the first consideration. This and cleanliness can be easily effected by rigid inspection by the track foremen. Next comes a neatly ballasted platform, a little whitewash on the sills, renewal of old sills with ties or bridge timber that ordinarily would be burned or piled in the storage yard. Add a few buckets of paint. Then offer a small prize and half the problem has been solved.

Next it may be observed that flower seeds are cheap and vine seeds are cheaper. A flower box with a few hardy plants or a vine is living publicity of the best sort. Or better still, a small flower plot arranged in an emblematic fashion with a slogan of the road, spelled with flowers. Fix to the wall a neat publicity board, the messages on which are frequently changed, and then by reason of the new ensemble sit back and watch how the wind shifts. No station is so isolated but some adaptation of this scheme is not practical. More often the rule than the exception, the community that is served will furnish the protective measures and, more than likely, some of the maintenance effort necessary to make the portal a show place. With such a decorative setting the station becomes not only the portal to the company's service but a gateway to the community of which every citizen will be proud. Make these silent sentinels monuments to the progressive principles of the industry. Silence is golden if the gold is there.

Daily Cleaning Keeps Cars Bright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AVENUE RAILWAY SYS

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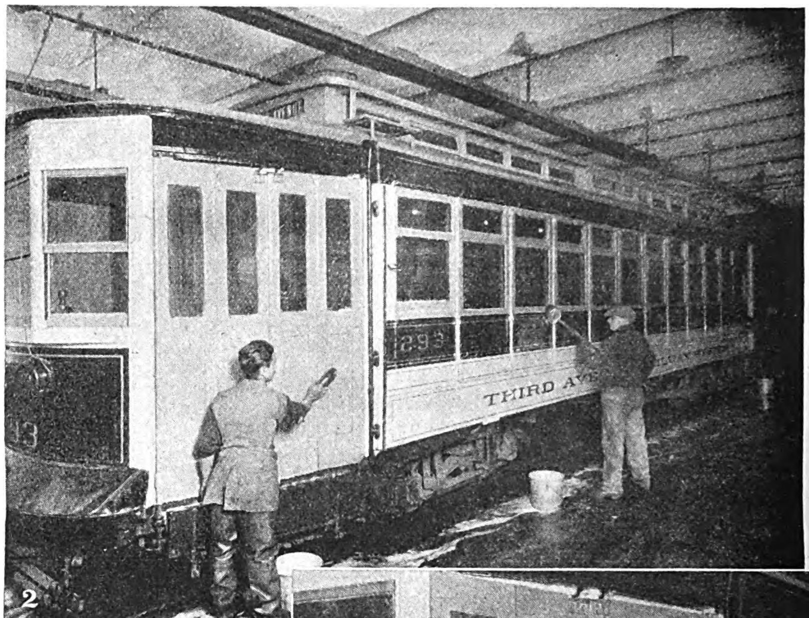
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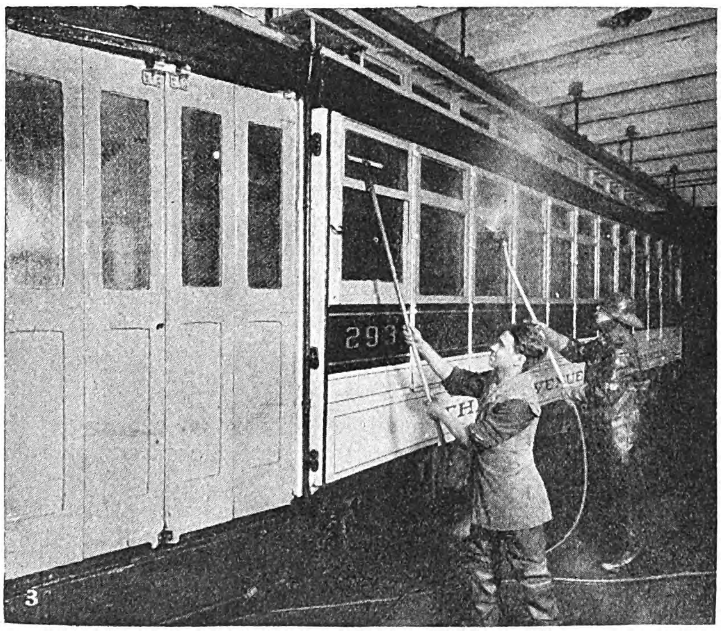
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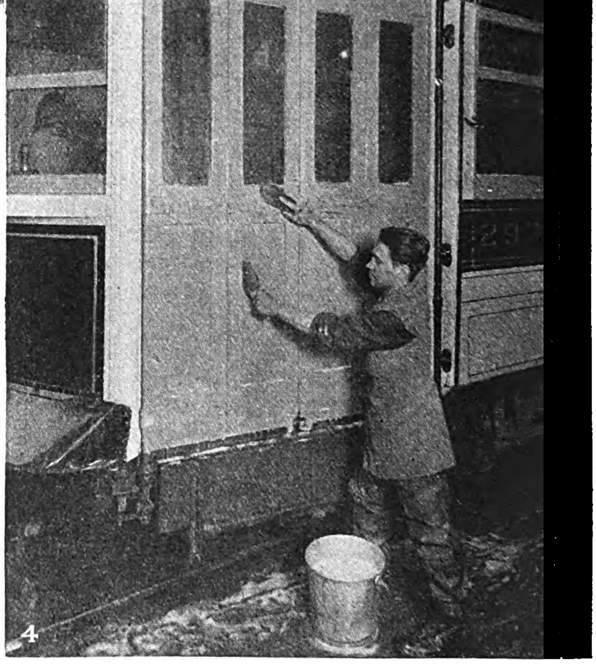

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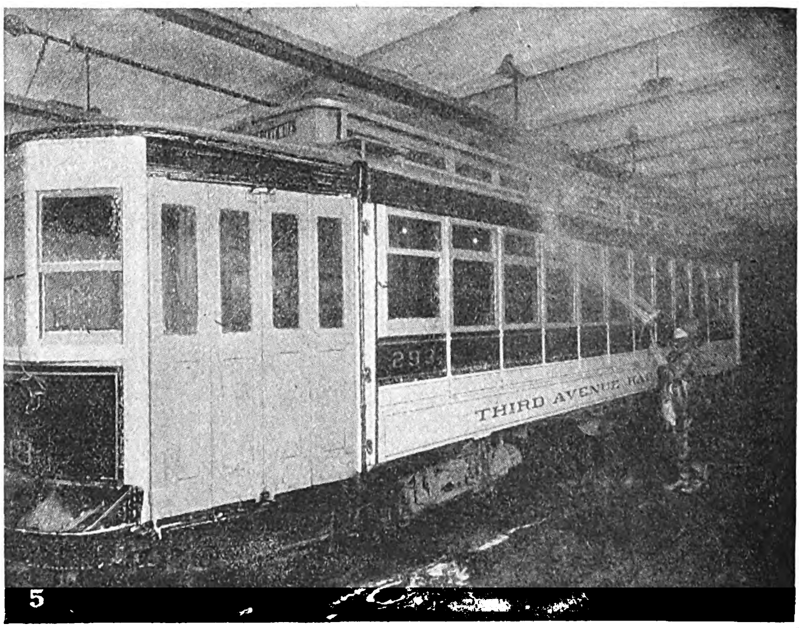
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THIRD AVENUE RA

5

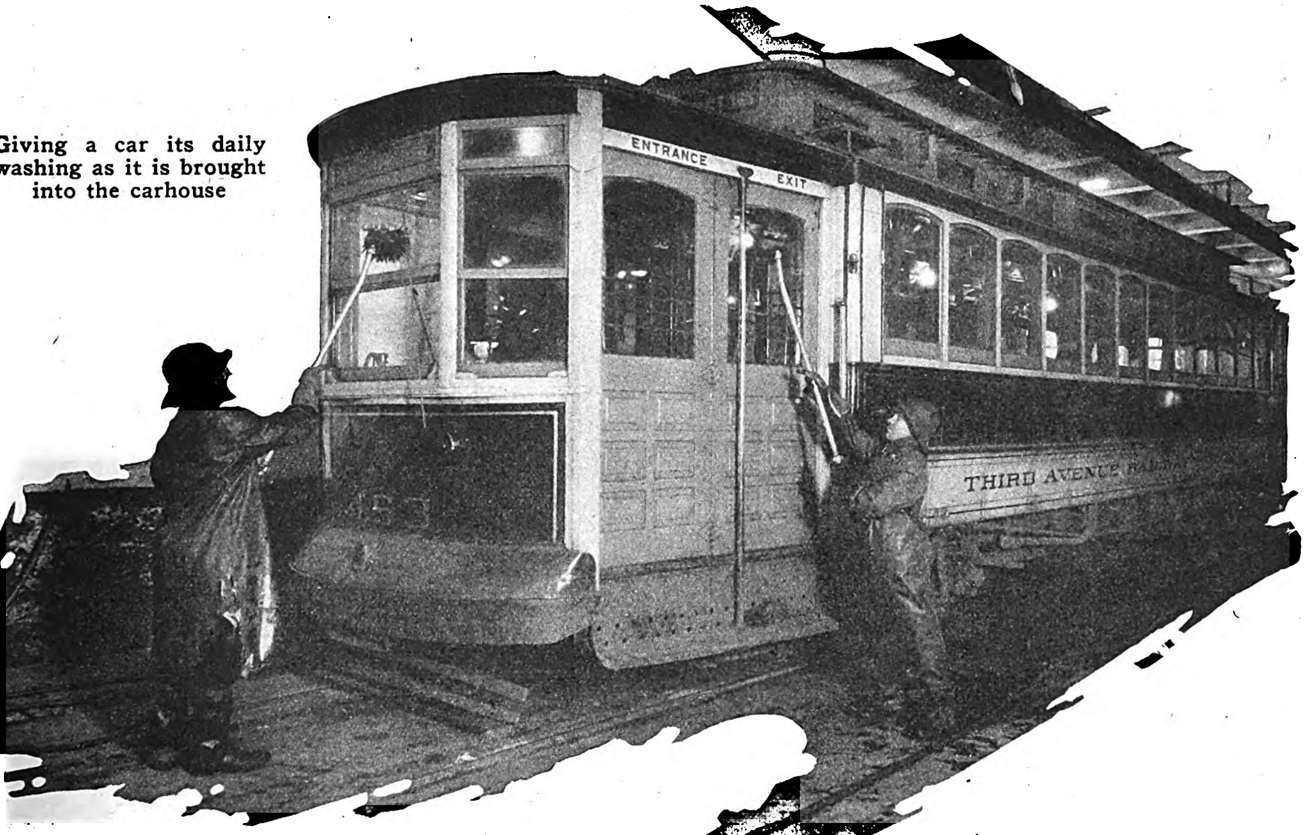
No. 1. Ventilator sides and sign windows are wiped carefully with cheesecloth.

No. 2. Applying soap suds and scrubbing cleans all parts.

No. 3. After scrubbing, the cars are rinsed carefully with a special brush and are then squeegeed to remove all streaks.

No. 4. Two types of scrubbing brushes are commonly used. A small furniture brush reaches corners and inaccessible places.

No. 5. Wetting down the exterior of a car is the first operation in the general cleaning.



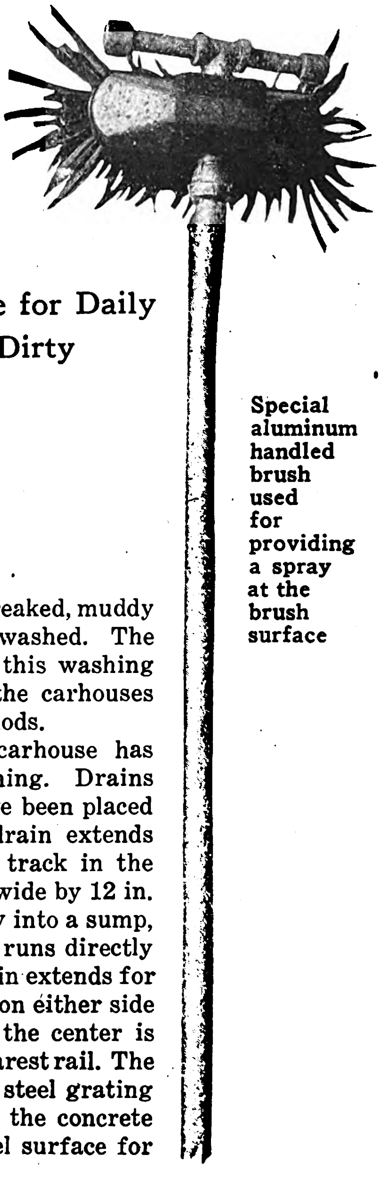
Giving a car its daily washing as it is brought into the carhouse

Clean Cars

Hold Patronage

Methods of the Third Avenue Railway, New York City, Provide for Daily Washing of Car Exteriors When These Become Spotted or Dirty from Traffic or Weather Conditions

By J. S. McWhirter
Superintendent of Equipment Third Avenue Railway System, New York, N. Y.

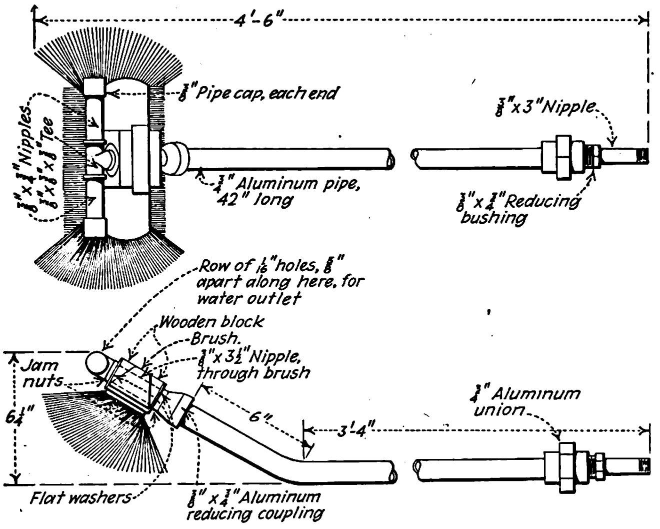


Special aluminum handled brush used for providing a spray at the brush surface

SPECIAL provision has been made so that cars can be cleaned frequently on the lines of the Third Avenue Railway System, New York City, in order to keep the company's rolling stock in the most attractive condition possible and also to prevent deterioration. Much of the track of this company is under elevated railway structures, where, during rainstorms or in the winter, there is dripping from the structure onto the cars. Even when there is no actual rain the windows and sides of the cars get a muddy appearance which is most undesirable. Also, during the summer considerable dirt and iron rust from the structure fall to the roofs of passing cars. Whenever there is a rainstorm, this washes from the roof down on the sides and the windows and produces a streaked appearance.

In order to provide for frequent cleaning, each carhouse has been equipped with a washing system. Cars are washed daily if conditions warrant. When there is a rainstorm or when cars begin returning to the carhouse dirty or with a streaked, muddy appearance all cars are washed. The usual practice is to do this washing as the cars return to the carhouses after the peak-load periods.

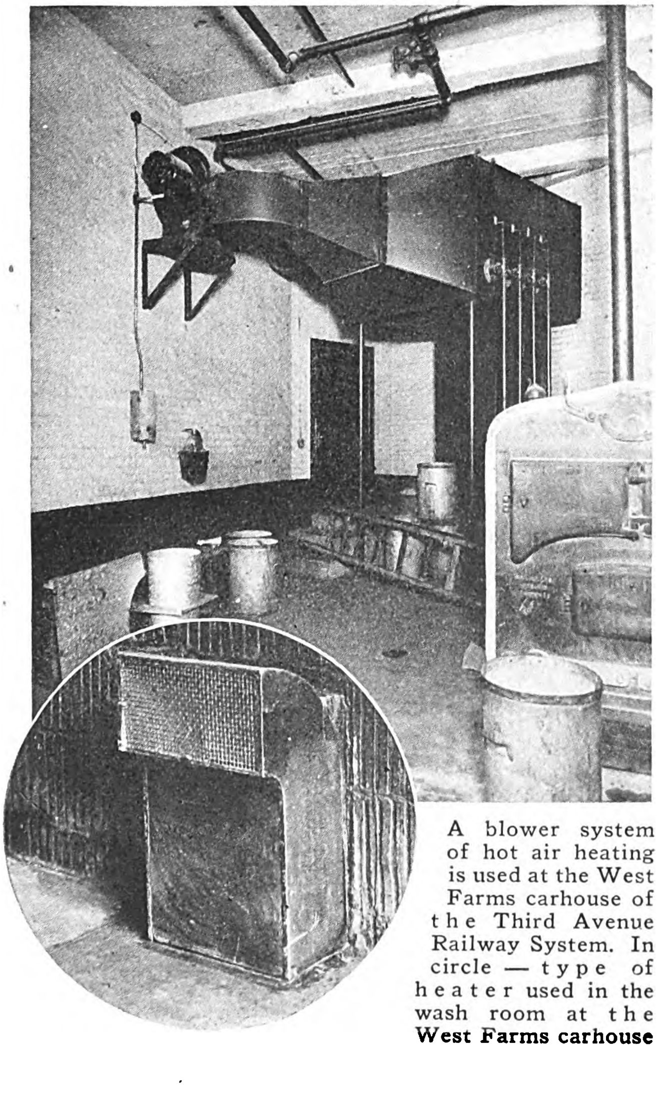
One track at each carhouse has been equipped for washing. Drains and a concrete floor have been placed in this section. The drain extends along each side of the track in the form of a trough 10 in. wide by 12 in. deep and sloped to empty into a sump, from which a 3-in. pipe runs directly into the sewer. The drain extends for a length of about 50 ft. on either side of the wash track and the center is about 2 ft. outside the nearest rail. The drain is covered with a steel grating whose top is flush with the concrete floor, thus giving a level surface for


4'-6"
3/8" Pipe cap, each end
3/8"x 1/4" Nipples
3/8"x 3/8"x 3/8" Tee
3/4" Aluminum pipe, 42" long
3/8"x 3" Nipple
3/8"x 3/4" Reducing bushing
Row of 1/16" holes, 5/8" apart along here, for water outlet
Wooden block
Brush
3/8"x 3 1/2" Nipple, through brush
Jam nuts
6 1/4"
6"
3'-4"
3/4" Aluminum union
Flat washers
3/8"x 3/4" Aluminum reducing coupling

Construction used for special aluminum handled brush

the men who do the washing as well as making the floor look neat.

At each location are four hose connections to the city water system so that four men can work at the same time. In an accompanying illustration, which shows the washing track at the West Farms carhouse, two of the water connections are alongside the shop wall, since the wash track is the first from the wall. The other two water connections, which come between tracks, are in the floor. These have removable covers for making the hose connection which can be replaced with the hose passing through a hole in the cover. Each hose has a length of 50 ft. so that all parts of the outside of the car can be reached readily. Ordinarily with four men a 43-ft. city car can be washed in 1¼ minutes. Where cars do not come in at such a rapid rate two men can do the washing in about 2½ minutes per car.



A blower system of hot air heating is used at the West Farms carhouse of the Third Avenue Railway System. In circle — type of heater used in the wash room at the West Farms carhouse

A convenient brush for the washing is used which has a special construction with a pipe connection over the top to provide a spray of water at city pressure. The brush handle is made of ¾-in. aluminum pipe and is 42 in. long. The lower end is provided with an aluminum union and a nipple for attachment of the hose. The upper end passes through the brush and then has a T-shaped connection of ⅜-in. aluminum pipe 10 in. long just at the upper face of the brush, with a row of $\frac{1}{16}$-in. holes spaced ⅝ in. apart along the side next to the brush. The water is forced out of these holes with considerable pressure and passes along the front side and into the brush. The spray of water itself is very effective for removing dirt and the rubbing of the brush, which also keeps filled with water, will remove any hard particles. The brush used is a No. H-701, manufactured by the Whiting Adams Company, New York, N. Y. An accompanying drawing shows the method of fastening the brush to the handle and the provisions for spraying the water and attaching the hose. The aluminum pipe is very light and lessens the fatigue of the workmen.

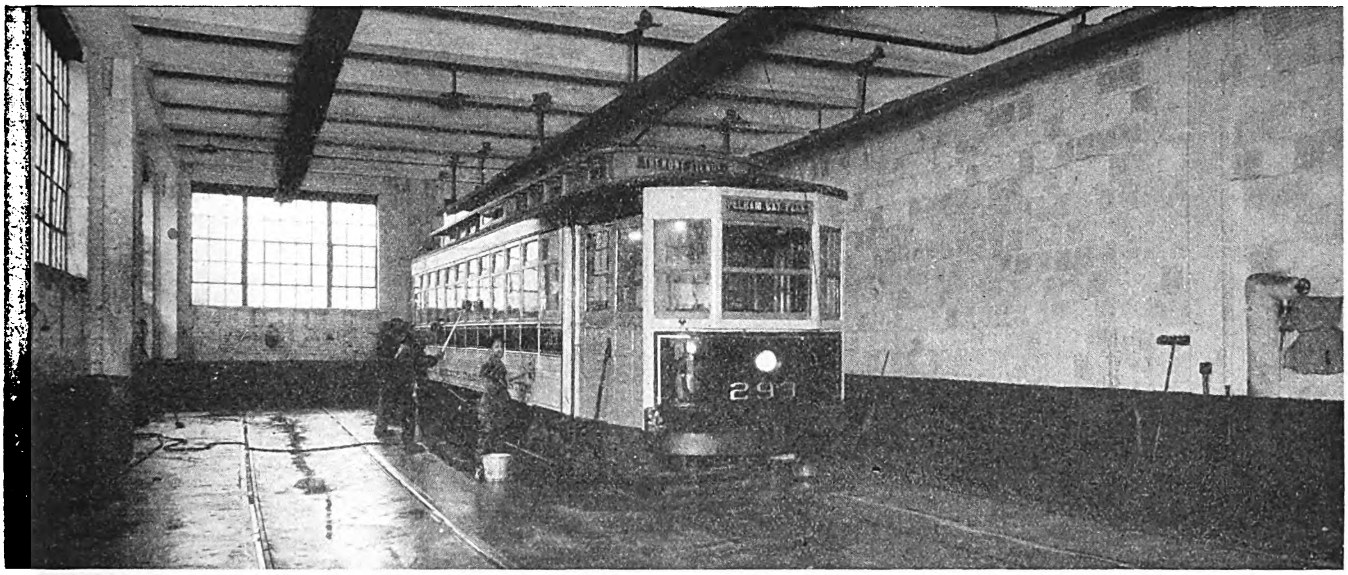
With four men washing a car, two start at one vestibule corner and work in opposite directions. The other two start at the diagonally opposite corner and work toward the first two. Each man wears a rubber coat, boots, hat and gloves.

All parts of cars in service are cleaned thoroughly and are scrubbed once each month. The wash room at the West Farms carhouse, which is typical, is provided with three tracks and is 30 ft. wide by about 60 ft. long. The floors are of concrete and are sloped to sumps for drainage, so that the water runs directly into the sewer.

To provide for efficient washing of cars during cold weather, the wash room is heated by a blower system. Air is heated over steam pipes in the boiler room and then blown through ducts. A 16-in. diameter pipe runs from the blower underground and from this risers are provided, each 10 in. x 20 in. The washing room has four outlets. The equipment and methods used are shown in accompanying illustrations.

For the general monthly cleaning the five men assigned to the work at the West Farms carhouse average thirteen or fourteen cars daily. One works inside rubbing off moldings, etc., with cheesecloth, one cleans the vestibules, two scrub and wash the outsides and one uses a squeegee, after rinsing. The brushes with the special aluminum handle and attachment for spraying the water are used advantageously in this general cleaning.

In cleaning the outside of the car all parts are first wet down by means of the aluminum handled brush. Little rubbing is done, as the water is simply sprayed on, the pressure as it comes out of the small openings being sufficient so that all parts of the car can be reached readily. After the exterior has been wet down a soap solution is applied. This solution is made up in advance and is kept in a barrel in one corner of the



General view of the wash room at the West Farms carhouse of the Third Avenue System

wash room. A 14-qt. pail of Amberzo vegetable soap, made by the Hildreth Varnish Company, New York City, is dissolved in a barrel of water. A pint of this solution is used to each 14-qt. pail of water for use on the car bodies. The soap solution is applied to the car body by round car washing brushes with handles of different lengths for reaching various parts conveniently. All of the brushes used are purchased from Whiting Adams, New York City.

Following the application of the soap suds, the exterior is scrubbed thoroughly with a flat floor scrubbing brush for large surfaces and a furniture rubbing brush to fit into the various corners and around moldings, window openings, etc. After the scrubbing, the rinsing is done with the aluminum handled brush, with considerable rubbing to make certain that all soap is removed. An ordinary type of squeegee, such as is commonly used for window washing, completes the outside washing program and prevents streaks while drying. After this the ventilator sash and side windows are wiped carefully with cheesecloth.

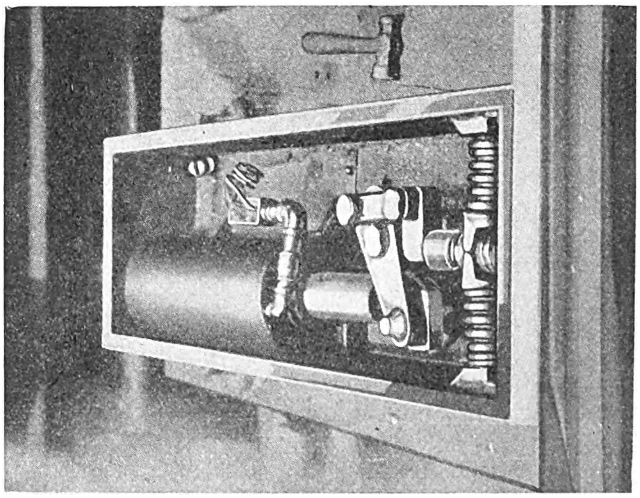
While the exterior of the car is being washed, men are busy inside. Platforms, vestibules, stanchions and similar parts are given the same scrubbing and washing as the exterior. Roofs are also given the same regular scrubbing. For washing the insides of windows of the car body a counter brush is used with plain water. No soap is used inside the car. Moldings, lamps, seats and other interior fittings are wiped with dry cheesecloth. It should be mentioned that cane seats are removed and scrubbed at the time the car goes through the shop on its regular painting schedule, and so the only attention given them during the monthly cleaning is to wipe off carefully and make certain that there is no oil or other material on them which might damage the passengers' clothing and so result in damage suits afterward. The flooring inside the car is flushed out with a hose. In all the interior washing particular care is exercised to make certain that water is not slopped or directed so as to reach any of the electrical apparatus.

This same general plan of washing is carried out at the ten carhouses of the Third Avenue system. The number of men at each varies, due to the differing numbers of cars maintained.

Knoxville Installs Electric Switch of New Type

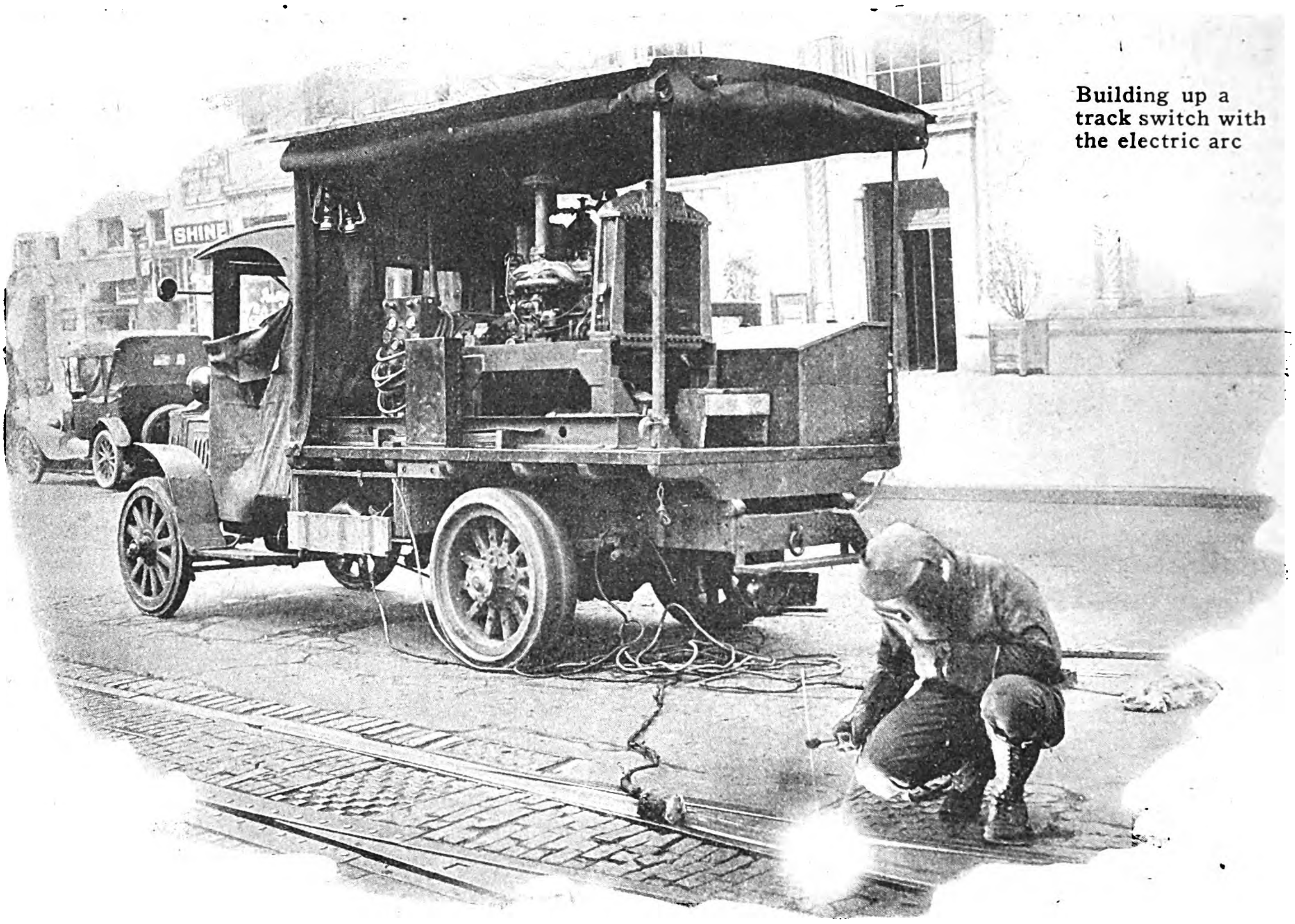
RECENTLY a new electrically operated track switch designed and patented by Charles A. Walker, electrical superintendent, Knoxville Power & Light Company, Knoxville, Tenn., was placed in service in that city. The first unit was constructed in the shops of the company.

As outlined in the patent application, the points of superiority claimed are that the electrical mechanism is contained within the non-magnetic casing, which can be filled with oil. The equipment thus inclosed is placed below the street surface in the usual manner, and the operating levers are connected directly with the switch point.



Mechanism of a new type of electric track switch developed in Nashville, Tenn.

It is claimed that the non-magnetic casing will be non-corrosive as well and the oil filling will prevent trouble due to moisture, either from leakage or from sweating. Suitable connections are made by which the wires are taken from the underground box by conduit to the side of the street, where connection is made with the trolley contacts in a conventional manner.



Building up a track switch with the electric arc

Welding Track Without Car Delays

Tracks May Be Kept in First-Class Condition by Welding with a Moderate Expenditure of Maintenance Funds — This Also Permits Effective Emergency Repairs to Be Made Speedily and Obviates Delays

By Edwin P. Goucher

Engineer of Way and Structures Capital Traction Company, Washington, D. C.

MAINTENANCE and construction work on the lines of the Capital Traction Company, Washington, D. C., is not allowed to interfere with the operation of the cars. Of course at times a delay of two or three minutes cannot be avoided, but a delay of four or five minutes means an investigation and possibly a reprimand to the guilty party. Cars are never rerouted in order to carry on construction work. Rerouting causes annoyance to passengers and perhaps requires a longer time for them to reach their destination. The installation of new track is done at night, after the last scheduled car has passed, and the track must be ready for the first regular car in the morning. If owl service is operated on the line in question the owl car is run in both directions on the adjacent track.

In this age of efficiency and economy it would be difficult to visualize what would result from a complete cessation of all practices and means of welding. This art as applied with present-day methods undoubtedly is saving millions of dollars annually in the maintenance costs for the electric railway industry alone. Not many years ago when a frog became badly worn, or a rail head broke, there was nothing else to do but buy a new frog or cut in a new piece of rail. Present-day welding methods have changed all this. On most properties a frog or switch, before being scrapped and replaced, has been built up with the arc at least once and possibly two or three times.

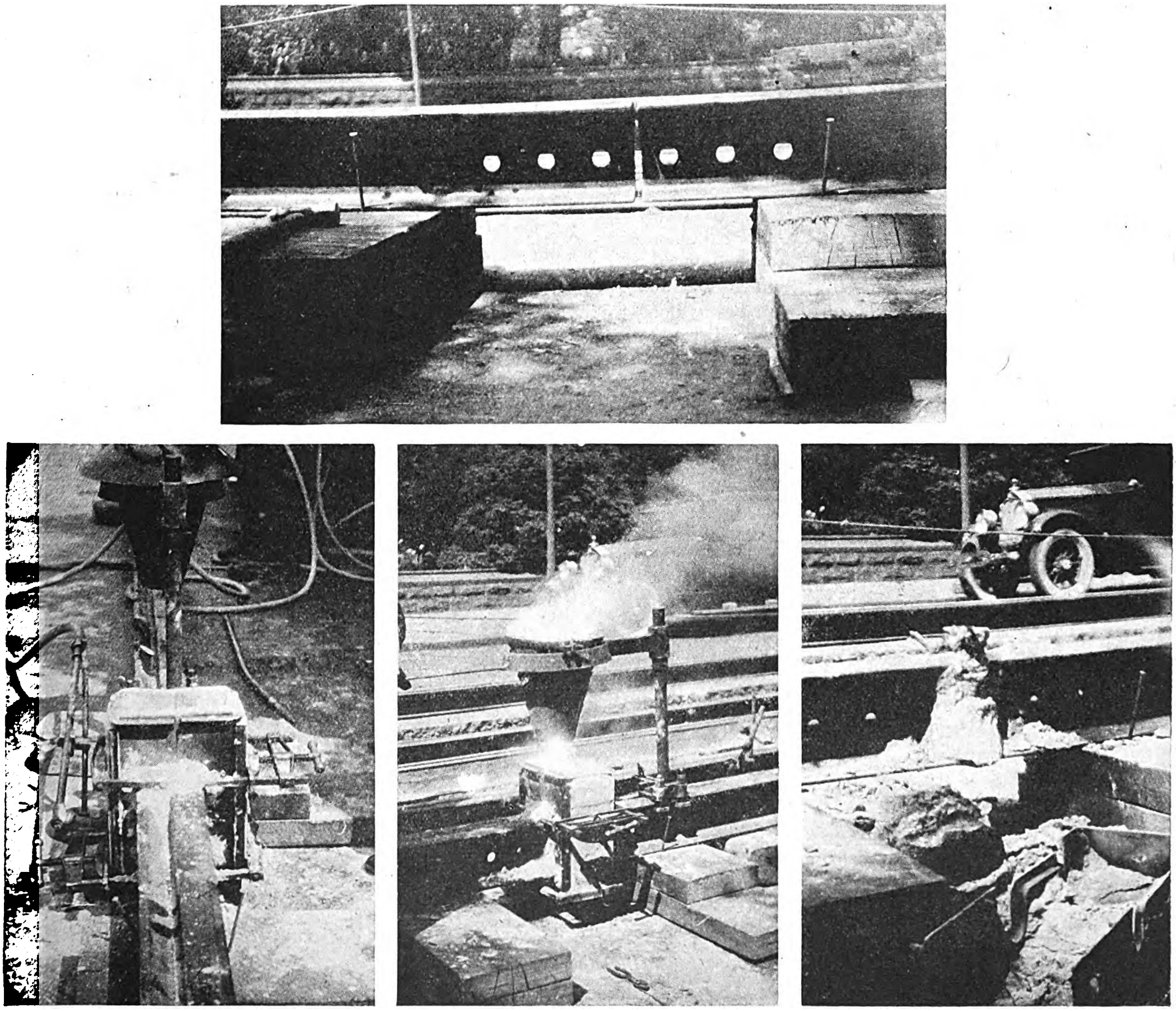
The Capital Traction Company is a firm believer in the value of welding as a means of reducing operating costs and making emergency repairs to obviate service delays. Three welders are kept busy practically the entire year building up worn frogs, cupped joints, worn guard rails and other miscellaneous work. Practically all of the tracks in the city of Washington are of the underground conduit type. Special work costs from six to ten times as much as similar layouts for the regular surface construction, so any one familiar with the savings effected by making welding repairs on surface track special work may readily understand that this amount must be very much greater when the repairs are made on the conduit type of track. The saving alone in interest on investments probably more than carries all the costs of the welding equipment and labor expended in making these repairs.

As an example, there is a double-track crossing on the lines of the Capital Traction Company that will be renewed complete this year. This crossing was scheduled for renewal in 1925, but by means of electric arc welding it was possible to hold it over until 1927. This job will cost installed about $21,000 and the interest for that amount for two years at 6 per cent is about $2,500.

The ever-increasing need for labor and time-saving equipment has resulted in the development of many new machines for various classes of work, and in my opinion one of the most important is the welding outfit mounted on an automobile truck. The old way of towing or hauling the welding machine to the job and back again, leaving the operator and his helper to shift for themselves during the day, is fast becoming a thing of the past. The time wasted while the machine is moved from place to place by the men is too costly, not to say anything about the lost time occasioned while waiting for a truck to move the outfit a mile or two to another job.

Broken rail heads, frogs, etc., are discovered usually by some one in the construction or maintenance forces, but quite often a trainman will report this condition before any one else has noticed it, possibly shortly after the break occurred. Repairs are made immediately if the nature of the break is at all apt to cause a delay to the cars. If of a minor nature, a welder is usually allowed to finish the job on which he is working before leaving for the other location.

Metallic arc welding is used for this class of work on our lines. For ordinary cupped rails, worn guards and manganese plates a high carbon rod is used. Where the break requires a large deposit of metal, such as a broken rail head, a low carbon rod is used to build up the metal to within about ⅜ in. of the running surface and the harder rod is used to complete the weld. We find this method superior to the use of the high carbon rod throughout the weld, and of course the low carbon rod is not suitable for use where it will be subjected to wear.



Several rail lengths are thermit welded at the side of the track and then are installed as one piece

At top—Rails set up ready for mold boxes.
At left—Mold boxes in position ready for welding 122-lb. A.E.R.E.A. 7-in. trilby rail.
In center—Thermit reaction taking place.
At right—Weld after removal of mold boxes and before it is cleaned up.

The Capital Traction Company has now standardized on thermit joints for new construction. While this method of welding presents no serious difficulty on the average property, to those of us operating the conduit system it is quite a problem. We cannot install portable crossovers wherever we wish and divert traffic to one track, nor can we lay temporary track on which to operate cars.

First and foremost in the minds of all Capital Traction employees is the understanding that the cars must not be delayed. Our livelihood depends on the cars and avoidable delays are inexcusable. We have effectually solved the thermit welding problem by welding four to six rails together outside the track, installing them as one piece and welding the intermediate joints at night between 1 a.m. and 5 a.m. This adds materially to the cost per joint as compared to other methods, but we feel that the increased value of the thermit joint is worth the difference. Thermit is also used in the construction of frogs, crossings, repairing broken switch and frog arms and in making compromise joints.

Cutting, brazing and welding with the oxyacetylene torch is now another large factor in track maintenance. This is probably more true of conduit track maintenance than of surface track, due to the increased use of iron and steel in the conduit type of construction. Each of the Capital Traction welders has a complete gas cutting and welding outfit in addition to the regular arc welding equipment. Frequently the combined use of these two methods results in a considerable saving in time.

When present-day traffic conditions are taken into consideration, the wonder is that any trackwork can be repaired or reconstructed without great expense for labor. This would undoubtedly be the case were the hand methods of past years still in use. But labor-saving tools have been developed and are being used to such an extent that instead of an increase, there actually has been a reduction of about 40 per cent in labor hours expended per foot of track on reconstruction work. The decrease of 40 per cent has been the experience of this company, and when this percentage is applied to present labor rates, we can see an actual saving in labor alone of more than $20,000 per mile of conduit track reconstruction, as compared with similar work before we had labor-saving equipment.

While welding equipment cannot be credited with a substantial part of this saving, it nevertheless plays a very important part in the upkeep and maintenance of the road, and in my opinion is probably responsible for as great a saving in that particular field as are our air compressors, derricks, etc., when used on construction work.

Dynamometers Regulate Tension of Trolley Wire

ON THE Boston Elevated System about 50 per cent of the trolley-wire breaks are due to fatigue, or crystallization. These are caused by the moving up and down of the wire at points of attachment and by vibrations set up in the wire by passing trolley wheels.

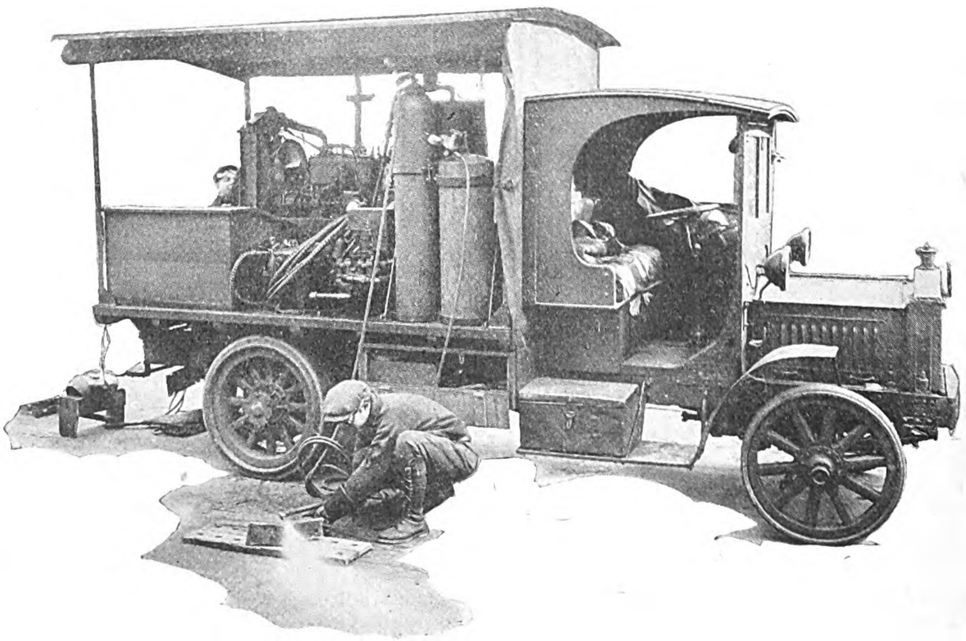
Many more of this class of breaks occur during the months of high temperature than during the low temperature months. For example, in June, July and August, 1926, there were 38 breaks of this nature, and in January, February and December there were nineteen breaks. In winter the wire is tight, due to contraction, and in the summer it is slack, due to expansion. This indicates that the tightness of the trolley wire has much to do with the development of crystallization.

Last September dynamometers were furnished each line maintenance crew, and the trolley wires are now pulled to tensions according to temperature, as follows:

At 0 deg.	2,100 lb.
At 30 deg.	1,800 lb.
At 60 deg.	1,500 lb.
At 90 deg.	1,200 lb.
At 120 deg.	900 lb.

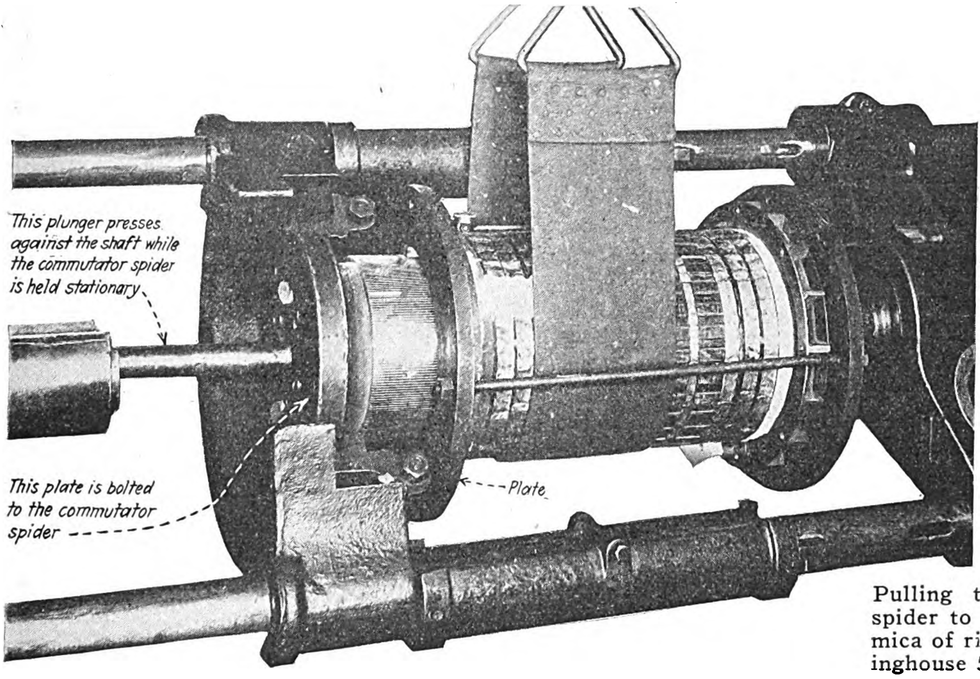
Wire pulled to these tensions will have at zero temperature approximately 3 in. of sag in a 100-ft. section and 7¾ in. sag at 120 deg.

Previous to the use of these instruments the trolley wire was pulled until the men considered it tight, the wire being pulled to the same degree of tightness in winter as in summer, hence wire installed during cold weather was very slack in summer.



Cutting with the oxyacetylene torch produces savings in track maintenance

Preventing Flashovers
Is an Important Part of
Commutator Maintenance*


This plunger presses against the shaft while the commutator spider is held stationary
This plate is bolted to the commutator spider
Plate

Pulling the commutator spider to repair the front mica of ring of the Westinghouse 557-R1 armature

Shellacking Mica V-Rings at Frequent Intervals Produces a Hard, Glossy Coating to Which Dirt and Carbon Dust Will Not Adhere Readily—Creepage Currents Are Decreased with Reduction in Flashovers

By Jesse M. Zimmerman
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company,
East Pittsburgh, Pa.

FLASHING over of the current from the commutator bars of railway motor armatures to the front metal V-ring is due largely to the presence of oil and moisture on the insulation. This tends to collect dirt and carbon dust, which mixture acts as a good conductor for creepage currents. Each flashover consumes part of the bond in the insulation as well as carbonizing the oil which may exist in or on the mica V-ring. This will permit an increase in flow of creepage current between the bars which eventually will become a small arc. When this occurs it soon will decrease the dielectric strength of the ring and at some future time ground the commutator.

As "an ounce of prevention is worth a pound of cure," the prevention of grounded commutators and the flow of creepage current on the front mica V-ring is quite as important as methods of repairing grounds. It is good practice to make the surface of the mica V-ring as smooth as possible, so that the dirt and carbon dust will not adhere readily to it.

REPAIRING PITTED BARS

If the front ends of the copper bars are badly pitted they should be machined so that the mica is flush with the copper. It will do no harm to take 1/16 in. from the bars. The front edge of the commutator face should not come to a sharp corner, but should be rounded off so that it will have a radius of at least 3/16 in. to 1/4 in. A sharp corner increases the number of flashovers because the electrical potential tends to build up on sharp edges. When an unbalanced voltage condition occurs in the operation of the motor a flashover from the sharp edge of the commutator face to some metal part of the motor will result. This flashover always leaves a pitted place on this part of the commutator.

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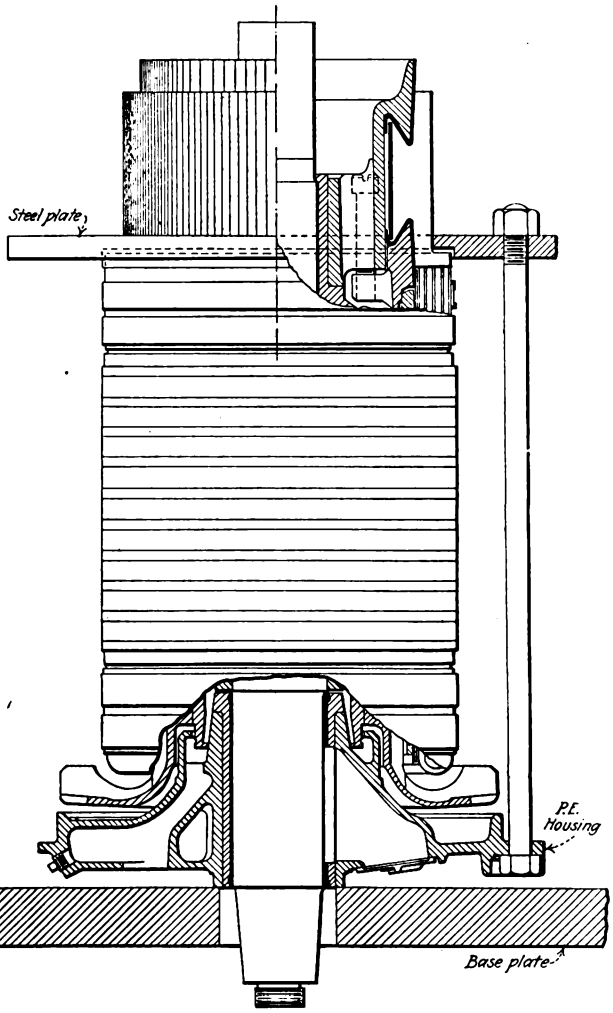
*This is the seventh of a series of articles on commutators for railway motors. The others were: Choosing Materials for Railway Motor Commutators, published Aug. 21, 1926; Important Considerations in Replacing Commutator Bars, published Oct. 23, 1926; Accurate Machining of the V's of Assembled Commutators Is Essential, published Nov. 20, 1926; Mica V-Rings and Bushings Have Important Functions in Commutators, published Dec. 18, 1926; Methods and Equipment for Efficient Assembling of Commutators, published Jan. 15, 1927, and Soldering of Railway Motor Commutators, published Feb. 19, 1927.

The mica V-ring should be cleaned carefully with sandpaper, making sure that no dirt remains on the mica in the corner next to the commutator bars. Dirt should also be removed from the groove between the front end of the mica V-ring and the metal V-ring.



Fixture for holding bars in position when removing the commutator spider. This is for use with armatures similar to Westinghouse 557-R1 and 587-D5

The front mica V-ring should be brushed, also, with a coat of heavy pure orange shellac and a smooth layer of soft four-ply twine wound on closely, pulling the ends through with a loop to fasten. It is best to place the mica V-ring protection on the commutator before the armature has been dipped and is ready to be placed in the baking oven. This will permit the protection to be baked at the same time. The essential feature is that the V-ring protection be thoroughly hardened before the armature is placed in operation.

This twine should be covered with three coats of shellac, ironing each coat in thoroughly with a hot iron. The first coat should be very thin so that it will penetrate the twine thoroughly. After the shellac has become hard it should be covered with a coat of black glossy baking varnish and baked thoroughly. This will leave a hard, glossy surface which can easily be kept free from dirt, moisture, oil and carbon dust. After hardening of the third coat of shellac some operators use one or more coats of commutator compound. This should cover the front ends of the bars, making a fillet of large radius between them and the mica V-ring and filling the groove between the front end of the mica V-ring and the metal V-ring. A commutator compound should resist oil and moisture as well as withstand flashovers. Some operators have found a satisfactory composition to be plaster of paris, dextrine and shellac, applied directly on the mica V-ring. However, a compound made of an iron oxide preparation gives better results.

In some shops it may not be convenient to bake the armature when applying mica V-ring protection. A good grade of air drying varnish should then be used instead of a baking varnish. The average commutator compound on the market will harden in four or five hours without being baked.

At every regular motor inspection period the mica V-ring protection should be cleaned. This can be done by wiping with a cloth dampened with gasoline. If this is carried out grounded commutators will be decreased.

METHODS OF REMOVING GROUNDS

Commutator grounds are more frequent in the front V than in the rear V. Sometimes it may be necessary only to remove the front mica V-ring, while at other times the commutator may be burned so badly that one or more bars will have to be replaced and the front metal V-ring repaired. Any holes burned in the metal V-ring should be built up by welding and finishing so that the mica ring will have a uniform seat.

Where the front metal is detachable the work of repairing the ground without disturbing the armature winding is very simple. Repair of commutators having the detachable metal V-ring in the rear is slightly more complicated. To replace the front mica V-ring in this type of commutator the commutator spider must be removed. At a glance one would think it necessary to remove the armature leads from the commutator to remove the complete commutator. With an inexpensive fixture this can be done without disturbing the commutator bars or the armature winding, as shown in an accompanying illustration.

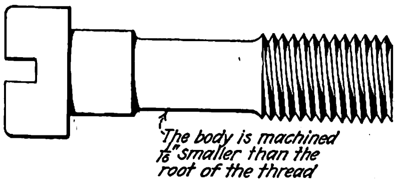
A steel plate is made which fits against the front end of the assembled segments. It should have an offset so that the brush face of the commutator segments will hold it in a central position. The plate should have holes the same in number and size and on the same bolt circle as the pinion end housing.

To hold the commutator bars several turns of steel banding wire should be wrapped on a paper in the groove in front of the neck and be soldered in one spot. The pinion end housing can then be assembled on the armature shaft and the armature placed in an upright position. With the steel plate on the front end of the assembled segments bolted to the pinion end housings by means of long bolts, the commutator bolts can be removed and the commutator spider pressed out in a suitable press.

With this fixture it is possible to hold the commutator bars against the rear V-ring, thereby keeping them in position, while taking out the commutator spider. If several commutator bars are to be renewed the armature should be placed in an upright position after the commutator spider has been pulled before the banding wire is cut and the fixture removed. Should it be necessary only to replace the mica V-ring the fixture and banding wire should not be removed.

When several of the bars are burned badly they should be replaced. A simple method of preparing new bars is to remove the damaged bars, together with an undamaged adjacent bar for a pattern. By clamping the unfinished bar in a vise with the pattern bar it can be trimmed to approximately the outline of the pattern. If the V's have been rough sawed or punched, the amount of filing may be reduced by taking an extra cut with a hacksaw. A new mica strip should be cut to the same size as the unfinished bar and fastened to the copper with a thin coat of heavy pure orange shellac. By clamping the unfinished bar and the pattern in a vise with a mica strip between them, the V's of the new bar can be filed to the same size as the pattern bar. The radius in the V's can be finished with a small rat-tail file and the bars are ready.

After assembling the new bars in the commutator the fixture should be put back on so as to hold the bars in position while the spider is being replaced. The armature leads should not be put in the slots of the new bars until the commutator has been tightened. Long headless stud bolts with a finished body should be screwed into the rear detachable V-ring before pressing the commutator spider onto the armature spider. These studs will serve as guides, accurately locating the bolt holes. After the commutator spider has been pressed on the armature shaft the studs should be replaced by the regular commutator bolts. Next the alignment of the bars should be checked in order to insure good commutation. It is also essential that the commutator be heated to at least 100 deg. C. before the bolts are drawn tight. This will soften the bond in the mica, permitting it to adjust itself to the irregularities of the metal parts and making it possible to obtain a tight commutator. A higher temperature should not be permitted as the armature coil insulation will deteriorate.


The body is machined 1/16" smaller than the root of the thread

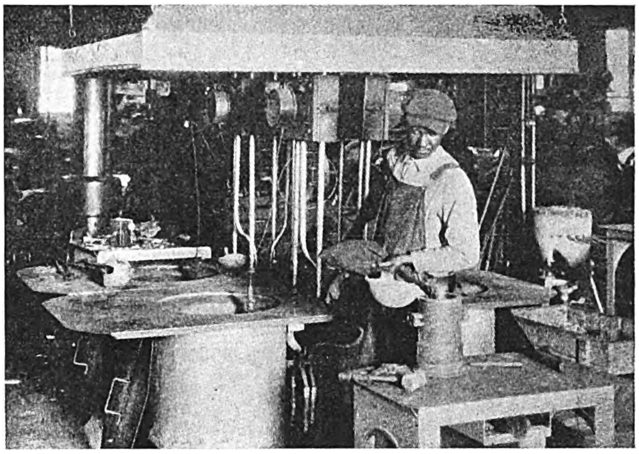
Commutator bolt designed to eliminate breakage

Bolt failures often are due to excessive length. The bolt strikes the bottom of the hole before the commutator is tight. The man tightening the commutator, not knowing of this, subjects the bolt to an excessive strain. To make sure that this does not happen, it is advisable to place the detachable steel V-ring in its final position and draw the commutator bolts tight before the commutator is assembled. This will show whether they are too long.

Breakage of commutator bolts can be decreased by machining the body approximately $\frac{1}{64}$ in. smaller than the root diameter of the threads. If the body of the bolt is larger than the thread root any twisting effect or expansion will occur at the end of the thread, causing a break at this point. If the body of the bolt is smaller the expansion and twisting effect will be distributed over the entire length of the bolt. The seat of the bolt near the head should be sufficiently large to insure a good contact in the detachable steel V-ring.

Electrically Heated Pots in Babbitt Department

SOME months ago the Pittsburgh Railways reorganized its Homewood shop and concentrated all of the maintenance work there, including all the rebabbitting of bearings. After some study it was decided to install four Westinghouse automatic electrically heated babbitt melting pots of 750 lb. capacity each. These pots were grouped as shown in the accompanying illustration. The two in the foreground contain armature bearing metal, the two in the rear metal for the journal babbitt. These pots have sufficient capacity to take care of all the bearings needed daily for the Pittsburgh Railways system, which operates approximately 1,250 passenger cars in addition to its miscellaneous equipment.



Relining an armature bearing in the new babbitting department of the Pittsburgh Railways

The automatic feature is convenient, as the danger of under or over heating metal is eliminated. At 6 o'clock in the morning the shop watchman turns on the current and by the time the men arrive for work at 7:30 the babbitt is at correct temperature for use. The automatic feature keeps it at this temperature until quitting time at night.

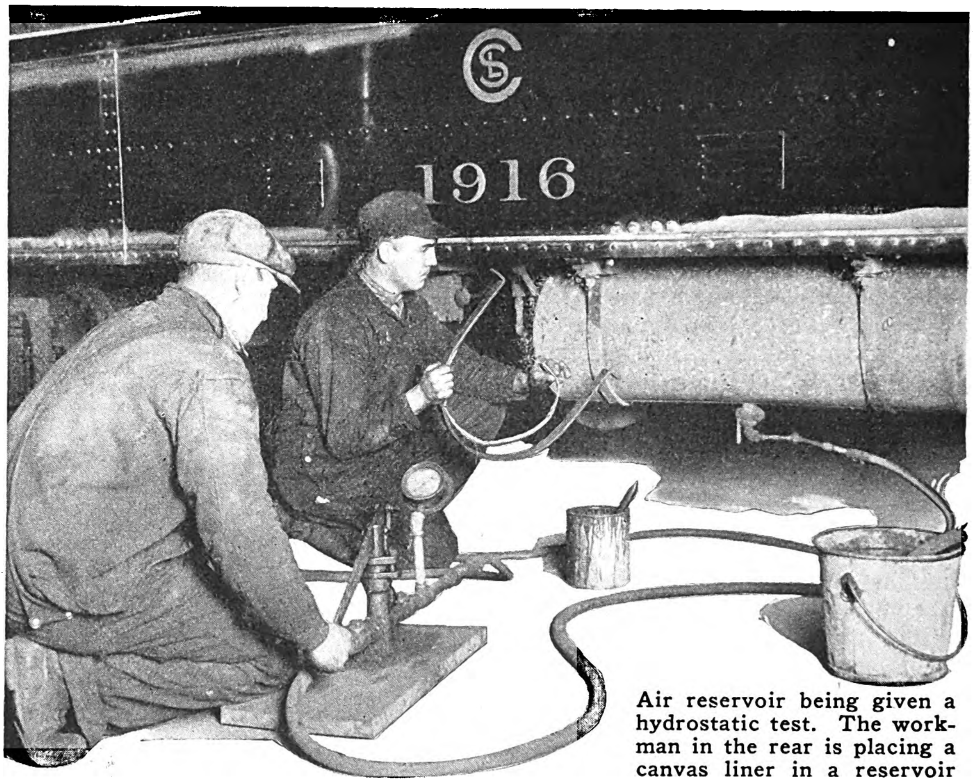
Under the system previously used two babbitt rooms were maintained. Gas heating was used and six men were employed solely on bearing work. At present two men take care of this department and have made it what the gentleman in the illustration calls "the show place of the shop," as well as a very efficient section.

Route Numbers for Public Service Cars

ALL cars operating in the Essex Division of Public Service Railway, Newark, N. J., henceforth will carry route numbers in addition to other signs indicating destinations. Cars of the Central line are already equipped and those of other lines will follow.

A sign with numbers in white on a blue background will be placed on the right-hand front corner of the roof of each car, one number facing the front and another the side.

Public Service bus lines have carried route numbers for some time, routes being designated by even numbers. Street car lines will be designated by odd numbers and bus lines and car lines operating in the same territory will as far as possible carry contiguous numbers.



Air reservoir being given a hydrostatic test. The workman in the rear is placing a canvas liner in a reservoir hanger

Inspection Methods that Made Possible

100 Per Cent Operation

On Dec. 20, Last Year, the Chicago Surface Lines Operated All of Its Passenger Cars and for Three Days Following This 99.97 Per Cent Were Operated

By T. H. Shaughnessy

Assistant Superintendent of Shops and Equipment Chicago Surface Lines, Chicago, Ill.

OPERATION of 100 per cent of all passenger cars owned by an electric street railway company is considered remarkable, but when this record is established by one of the largest street railway systems it is an achievement—something that did not "just happen," but the result of plans carefully worked out and details followed to the end. Therefore, the task imposed upon the shops and equipment department of the Chicago Surface Lines was by no means a light one. This was referred to briefly in an article in ELECTRIC RAILWAY JOURNAL for Jan. 1, 1927, page 10.

During the late summer and fall months special inspection and attention were given to all parts of the electrical equipment. All main fuse boxes were overhauled and inspected carefully. The terminals were tightened and renewed where necessary, insulating partitions and barriers were cleaned and boxes were given a coat of good insulating paint, inside and out.

Motor junction boxes and terminal boards were cleaned out thoroughly. All terminals, terminal screws and sleeves on the end of motor leads were checked and put in first-class condition. Also the motor leads themselves were thoroughly inspected, broken insulation was repaired and leads were renewed where necessary and repainted.

The rheostats were tested for weak insulation and cleaned. The rods tightened, all leads were examined closely and the terminals were tightened. The wooden supporting sticks were cleaned thoroughly and then repainted. Any that were found charred near the bolts, due to current leakage from defective rheostats, were renewed.

Electric heaters were blown out with air, the supports were tightened, the heater coils checked, terminals tightened and coils or heaters renewed where necessary. Thermostats and thermostat switches were inspected, contacts renewed where necessary and all parts tightened. Heater fuse boxes received a special inspection and all weak or burned fuse clips were renewed.

All air tanks were given a hydrostatic pressure test equal to 1½ times the working pressure. Then they were thoroughly painted and a new strip of canvas, soaked in paint previously, was installed between the tanks and their supporting bands and hangers. The safety valves were tested and governor settings were checked. At the same time all air gages were checked by the method of installing a master air gage in the air line.

All car wiring and motors were tested carefully with instruments. This is the regular practice in our shops at general inspection periods.

Truck and car body inspection and repairs were also given closer attention than usual. Material and supplies were prepared in sufficient quantities to meet all requirements. Corner posts, vestibule posts and other parts were painted and kept in stock, ready for installation when required.

Terminals as well as fuses were given careful attention

At the carhouse foremen's semi-monthly conferences the importance of putting all cars and equipment in the best possible condition was stressed and time and again it was pointed out that it was the duty of every one concerned to believe in himself and in the value and necessity of his work.

With the work in the shops reduced as cars were not taken in for general overhauling, workmen were transferred to the carhouses, to assist in making repairs to cars having damage done to the body, vestibule, etc., with the result that a total of 182 cars were repaired and placed in rush-hour service during the four days preceding Christmas Eve, as shown in the accompanying table.

When it is considered that more than 20 per cent of the cars in use have two-motor equipments and a failure of any kind would put a car out of service the standard of maintenance is self-evident.

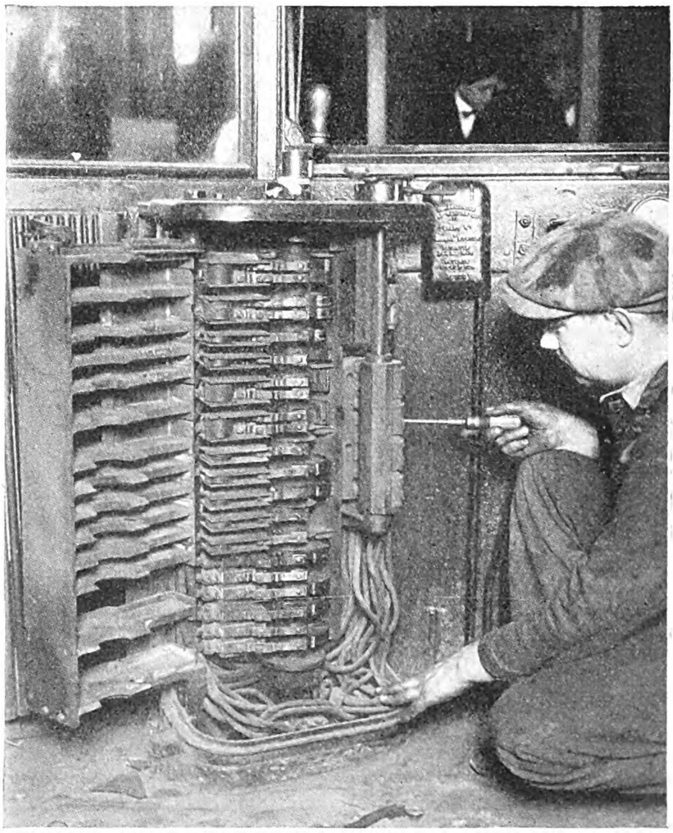
With the 100 new cars delivered during the year and available, the work in connection with overhauling cars was kept up until Dec. 7. No cars were taken into the shops for overhauling after that date. There were in the two shops on Dec. 1 67 cars for overhauling and 54 cars for damages and other repairs, or a total of 121.

On Dec. 7, the last day that cars were taken in for overhauling, there were 55 cars undergoing overhauling and 35 in for damage repairs, a total of 90 cars in

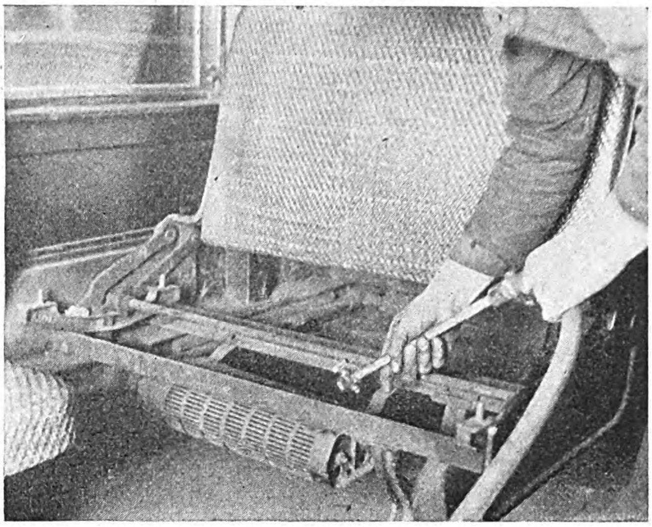
CARS REPAIRED AT CAR STATIONS AND SHOPS AND PLACED IN RUSH-HOUR SERVICE, DEC. 20 TO 23, INCLUSIVE

12-20	12-21	12-22	12-23	Total
47	39	46	50	182

Motor lead junction boxes were inspected carefully and all connectors tightened



All parts of controllers received special attention on inspection



Heaters were blown out with compressed air and all supports, terminals and coils were tightened

the two shops. This total was reduced to zero on Dec. 20 and increased again to one car on Dec. 21, 22 and 23, due to one car being sent in each day with heavy damages, which could not be completed before the rush-hour period.

During the month of November at the sixteen carhouses approximately 25 cars per day were held in for repairs during the rush-hour period, or about 1.5 cars per carhouse. This number was reduced, so that from Dec. 1 to 19 the number of cars held in daily for repairs at carhouses during the rush hour was approximately eleven, or practically 0.7 car per carhouse per day. An accompanying table shows the number of cars available, number of cars operated and number of cars in carhouses and shops from Dec. 1 to 23 inclusive.

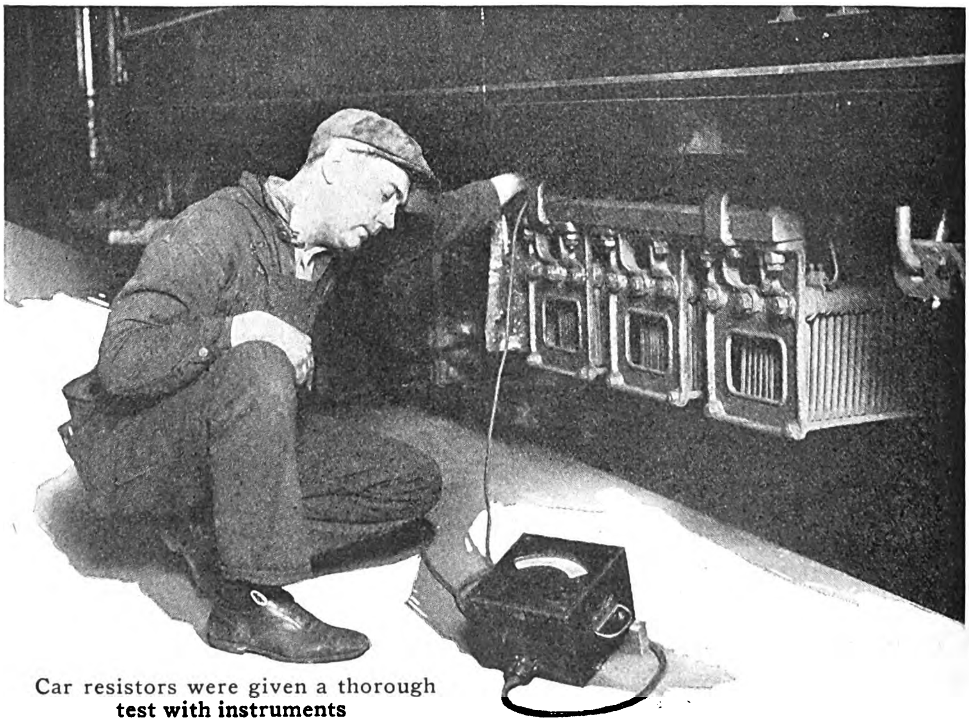
CARS AVAILABLE AND OPERATED BY CHICAGO SURFACE LINES DEC. 1 TO DEC. 23, 1926, INCLUSIVE

Date	No. Cars Available	Per Cent	No. Cars Operated	Per Cent	No. of Cars in Carhouses	Per Cent	No. of Cars in Shops	Per Cent
12- 1	3,490	95.9	3,384	93.0	28	0.8	121	3.3
12- 8	3,557	97.7	3.497	96.1	6	0.2	76	2.1
12-15	3,621	99.5	3,589	98.6	2	0.06	16	0.44
12-16	3,619	99.45	3,597	98.8	5	0.14	15	0.41
12-17	3,625	99.61	3,597	98.8	5	0.14	9	0.25
12-20	3,639	100.0	3,639	100.0	0	0	0	0.00
12-21	3,638	99.97	3,638	99.97	0	0	1	0.03
12-22	3,638	99.97	3,638	99.97	0	0	1	0.03
12-23	3,638	99.97	3,638	99.97	0	0	1	0.03

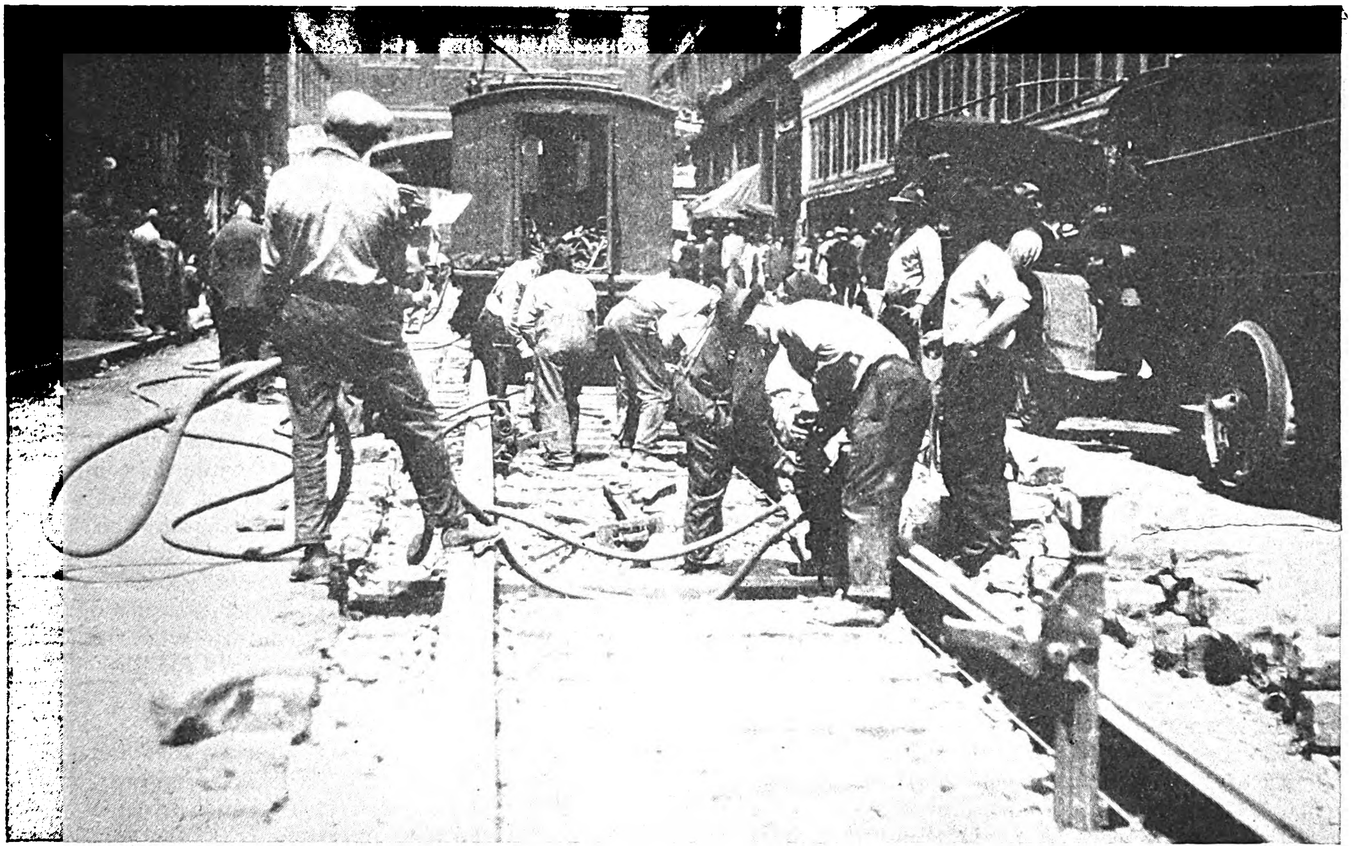
It will be noted from the table that on the four days immediately preceding Christmas Eve there were no cars held in for repairs at any of the carhouses during the rush-hour period. This means that 100 per cent of the cars at the sixteen operating carhouses were available and operated during the rush-hour period on four consecutive days. As far as is known by the writer, this record has never been equaled.

The co-operation of the transportation department with the shops and equipment department in the careful handling and operation of the equipment was of course essential, and it was through a complete understanding and co-ordinating of interests that the exceptional results were accomplished. All operators entered into the work with enthusiasm and by careful handling of mechanical and electrical apparatus failures due to service abuses were reduced materially. The primary objective of the entire organization was to keep cars in service and to avoid delays that would inconvenience passengers.

The high class of maintenance work that formed an essential part of the continuous program for putting car equipment in first class condition through regular overhauling and careful attention to maintenance details provided a substantial foundation for such an undertaking. Many defects were discovered before they actually produced trouble and so the real work of repairs was reduced. Also by providing a supply of spare parts and equipment ahead of time, defective parts could be replaced quickly and the actual work of repairs made during periods when more attention could be given to the work. By providing a maintenance program so as to make all cars available for service during the periods of maximum load an investment in extra equipment to take care of proper service was avoided.



Car resistors were given a thorough test with instruments



Many small tools such as concrete breakers and tampers are used in track maintenance by the Pittsburgh Railways

Pittsburgh's Track Repair Organization Permits No Delay to Service

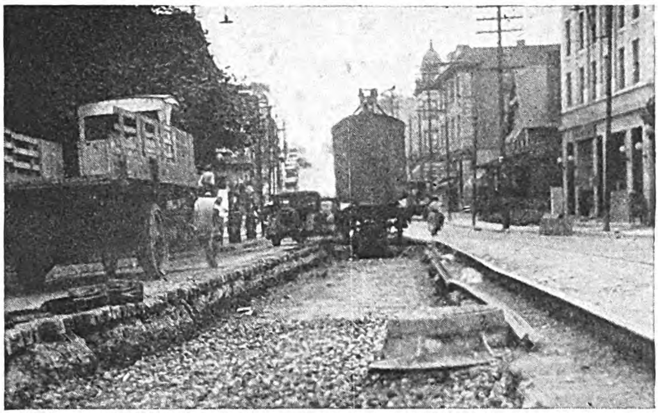
The Construction and Maintenance Sections of the Way and Structures Division Work with the Municipalities Through Which the Company Operates and Meet the Various Schedules of Improvements that Are Undertaken

By O. Williams

Superintendent of Way and Structures Pittsburgh Railways, Pittsburgh, Pa.

UNDER the new organization of the Pittsburgh Railways all maintenance and construction of track is handled by the maintenance of way and structures division of the operating department. This department is headed by a superintendent reporting directly to the general manager. In order to meet the heavy demands for new track and also to keep the present tracks in good, safe operating condition the work is divided between the maintenance and construction sections, each of which is headed by a superintendent reporting to the department head. The maintenance section deals chiefly with the repairs of track and paving and the installation of small jobs of special work needed for renewals. The construction section does the larger renewal and construction jobs, as this department is especially equipped for the purpose with modern labor-saving devices. The personnel of the construction section is made up of a superintendent, three general foremen and ten construction foremen. The number of men employed throughout the season will vary between 150 and 250, depending upon the quantity of work on hand.

The equipment of this department consists of four Thew shovels mounted on standard car wheels, three one-bag concrete mixers, two large 10-in. x 10-in. air compressors, three 6-ton steam rollers, two complete thermit welding outfits, six steel Differential dump cars and many smaller tools, such as pneumatic concrete breakers and tampers. All of this equipment except the steam rollers is operated with direct current taken from the trolley wire. In moving the shovels and concrete mixers from place to place the motive power is supplied by one of the dump cars. The air compressors and welding outfits are mounted on single-truck motor cars and so can move readily from place to place under their own power. The steam rollers are transported on flat cars, generally pulled by a dump car. Supplementing all this equipment is a Universal crane



Preparing new track foundations in West Liberty near Pioneer Street

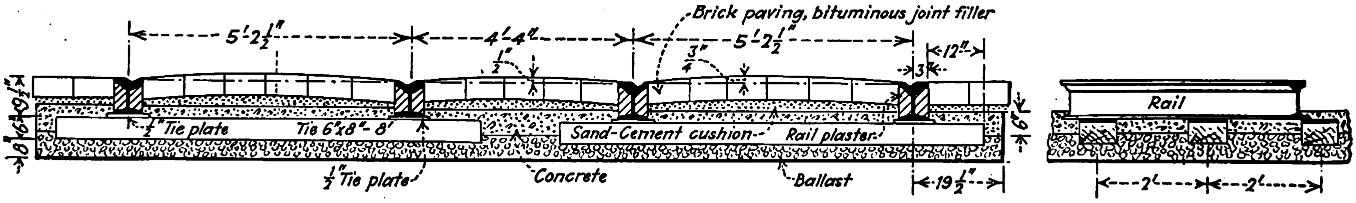
mounted on a 5-ton Mack motor truck and also an electrically operated crane mounted on a double-truck car body. These two cranes are also used whenever needed by the maintenance department in the installation of special work jobs.

In 1924, when the Pittsburgh Railways was removed from the receivership, the agreement entered into with the city of Pittsburgh provided a blanket annual payment of $300,000 in lieu of paving charges, taxes, etc. It states that the work of repaving brought about by track removal or replacement, maintenance of track or car operation shall be done by the railway under the plans and specifications submitted to and approved by the director of public works. In case the mileage of track operated in the city is increased or decreased, either by annexation of contiguous territory or by construction or removal of tracks by the company, then the yearly payments as provided shall be increased or decreased proportionately.

After the signing of this agreement by the city of Pittsburgh the railway immediately presented the same proposition to the various boroughs and townships in which it had tracks upon paved streets. As a result there are now, including the city of Pittsburgh and Allegheny County, 38 municipalities operating under this agreement. Also several agreements are in effect in which the railway company has agreed to install the concrete base and the municipalities to furnish the surface paving. Under the agreements the new track constructed by the railways is determined almost entirely by these municipalities in preparing their repaving schedule.

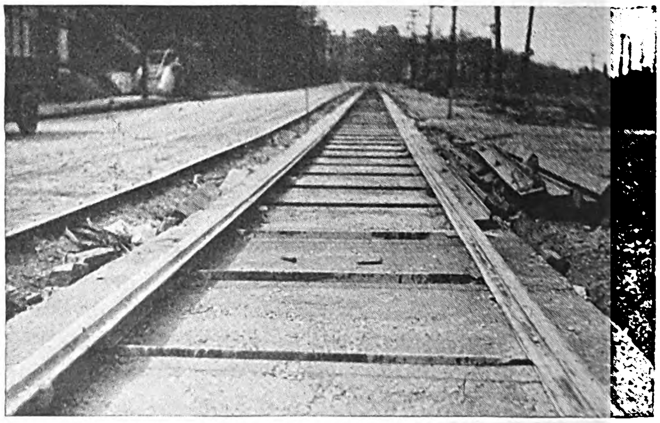
The main problem confronting the construction section was how best to meet these various schedules and improvements of the municipalities, working with them and their contractors in making these changes, and still work efficiently. Due to the wide range of territory served by the Pittsburgh Railways it was determined that the track to be built in the farthest outlying districts would be done by contractors, while the company's forces would operate within the city, or at least within a reasonable radius, in order to facilitate the transporting of equipment from one job to another. The railway next proceeded to prepare a schedule of the starting and finishing dates for certain sections of track on each job, arranged so as to conform with the starting dates used by the municipalities for the paving of the flank. In this way the railway was generally able to build one track and move to the next location while the municipalities' contractor finished the street flank on the first job, after which the railway would return and build the other track, which in turn would be followed by the street flank.

Since the various municipalities had several jobs scheduled to start at approximately the same date, the construction gang was divided into six units of approximately 25 men each. Thus all jobs could be under construction at the same time. In this case two jobs were handled by one general construction foreman, who moved his equipment from one job to another in the order in which they were needed. After certain experiments and slight rearranging of the schedule it was possible to place a shovel on a job, finish a stretch of grading, move to the next job and start grading again with but little lost time. The same procedure was used with the tamping and roller outfits, so that in all there was an almost continuous rotation of equipment. The welding gang necessarily followed closely with the final



Typical cross-section of track construction used by Pittsburgh Railways

Concrete used in track construction on East Street



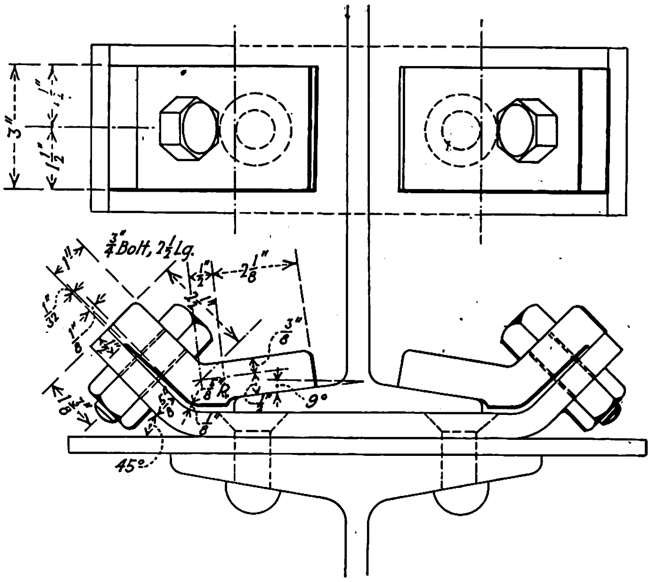
Ballast in place on section of track on McClure Avenue tamping operation on each job, pouring and grinding the necessary thermit welds.

This method created a tendency to improve the efficiency of each of these units by putting them on a competitive basis, as each had to keep up in order to permit moving upon scheduled time to the next job. Doing the work in this manner resulted in an almost uniform speed of about 650 ft. of finished track per week by each gang throughout the construction season. In attaining these results the assistance and co-operation given by the municipalities and contractors was of the greatest importance. Also contributing to the success was the excellent condition of the construction equipment, which had been overhauled thoroughly by the individual operators in the railway shops during the previous winter shutdown.

As is usual with all schedules, many things arose which had not been anticipated. There developed, as the season progressed, certain improvements which were deemed necessary and which necessitated the construction or rebuilding of some track. These were fitted into the schedule as well as possible, and whenever the construction gangs were too busily engaged to take care of the work it was allotted to the maintenance section and carried through in that way.

There were also quite a few jobs which required a little extra attention and in which more than ordinary conditions covering track reconstruction had to be met. A few examples of this will give some idea of this:

In placing the rail across the Ninth Street bridge it was determined to use thermit-welded joints. As this bridge has a steel deck upon which had been fastened clips to receive the rail it was necessary that the rail first be laid on ties, the entire length welded, then dropped into place on the clips and bolted into position. The design of these clips is shown in an accompanying sketch.

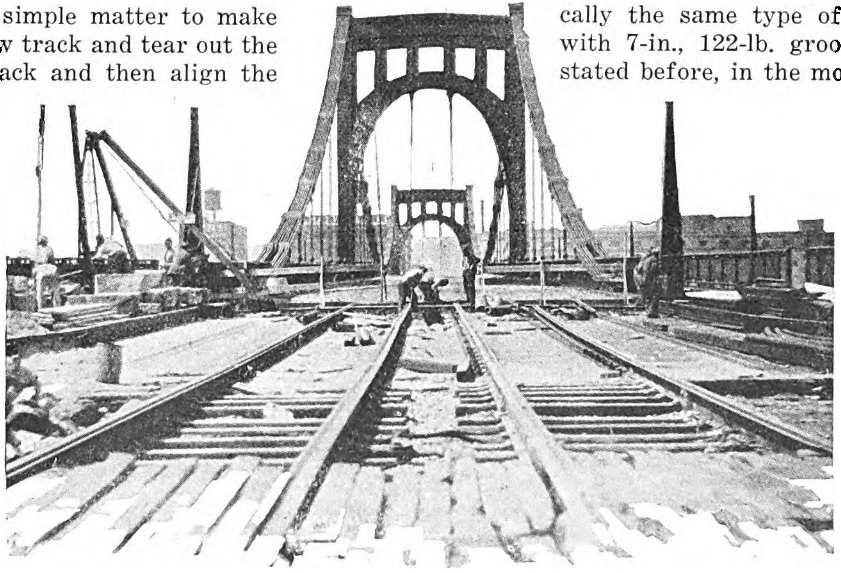


Type of clip used to hold rails on Ninth Street bridge

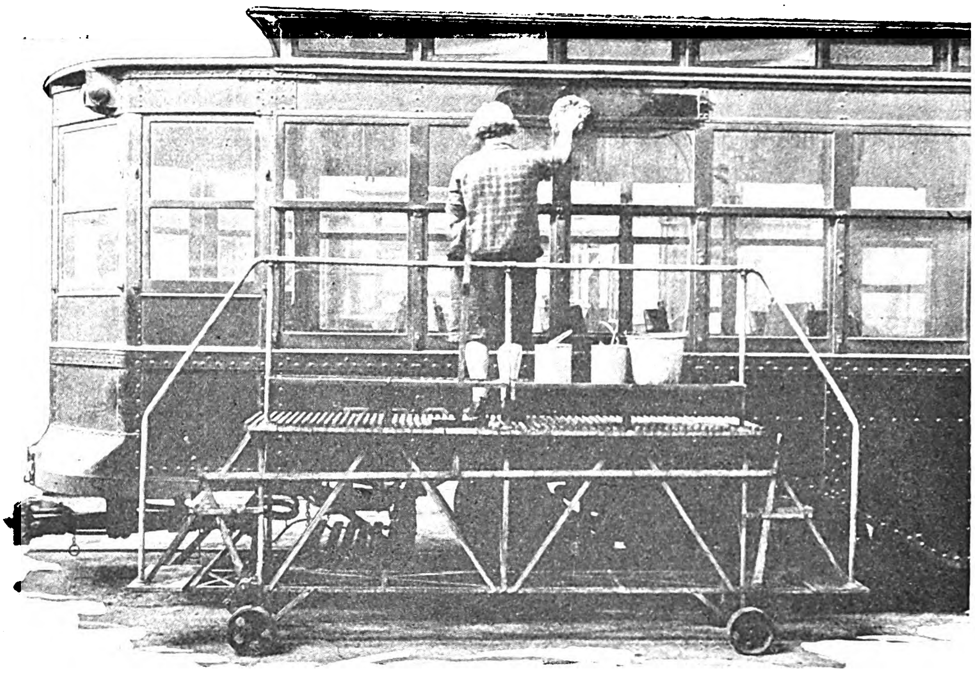
In another instance it was decided to reconstruct only one track in the center of a street where previously there had been two, and also that this should be done without any interference to traffic. This was accomplished by placing temporary crossovers, removing one track, taking out as much of the sub-grade for the new track as possible with a shovel and completing the grade by hand. This, of course, extended somewhat into the second track. The ties were then placed between the ties of the old track and the new rails laid. After this it was a simple matter to make connections to the new track and tear out the section of the old track and then align the new track in its proper location.

In another instance it was necessary, due to county road improvement and the necessary installation of a large special work job at an important intersection, to unite both the maintenance and construction sections. These worked day and night to speed up the installation. With the closing of the Sixth Street bridge it was decided to install an additional loop to assist in rerouting the cars formerly crossing the bridge. Here again the construction section found it necessary to build a track in a heavily congested district on a street where there already was one track which could not be disturbed until the new one and its connections had been completed. This situation was met by first constructing as much of the new track as possible and then during a night in which the cars were rerouted making the necessary connection at each end. At this time also the maintenance section was called in to assist, as extreme speed was necessary.

In summing up the results accomplished by this department it was found that in 1926 approximately 16 miles of single track was built in the city limits of Pittsburgh. The straight track in this total was built of 9-in., 134-lb. grooved girder rail laid on 8 in. of gravel ballast and 6-in. x 8-in. x 8-ft. oak ties. The joints were all made by the thermit-welding process. The special work in most cases consisted of 9-in., 152-lb. grooved rail placed on the same type of construction. Outside of the city of Pittsburgh some 14 miles of single track was built, most of it using practically the same type of construction except with 7-in., 122-lb. grooved girder rail. As stated before, in the more outlying localities the track was built under contract. Of this there was a total of approximately 6½ miles, about 3½ miles of which was built in Glassport Borough, some 2 miles in the city of Washington, Pa., and 1 mile in the city of McKeesport. Thus a total of approximately 30 miles of single track was reconstructed last year on the system.



Reconstructing tracks on the Seventh Street bridge, Pittsburgh



After removal of grease and dirt with pumice stone, the surface is rinsed with warm water applied with a sponge

Frequent Painting Required

for Modern Rolling Stock

Improved Methods Will Reduce Painting Costs so that Railways Can Afford to Paint Oftener—Cars Should Be Painted Once a Year

By A. T. Clark
Superintendent of Rolling Stock and Shops
United Railways & Electric Company, Baltimore, Md.

KEEPING cars attractive requires a carefully worked out system for cleaning and frequent painting. Old-time methods produce a beautiful finish and long life for the paint, but with the present congested city traffic, which soon scratches and mars the surface, frequent painting is most essential. The older systems of painting were expensive and the piano finish which was secured is not needed for a street car. The most essential feature is an attractive appearance of the car as it is viewed from the sidewalk. By adapting methods that will reduce cost and keep the time of painting at a minimum, more frequent painting can be done economically.

Old-time car painting methods followed closely the practices used in fine carriage and coach building and the workmen were, for the most part, recruited from shops that built vehicles of that type. Such a workman had served for many years under an arduous apprenticeship, and only when able to take a carriage or coach and paint, varnish and stripe it completely, doing all the work alone and unaided, was he considered a "coach" painter.

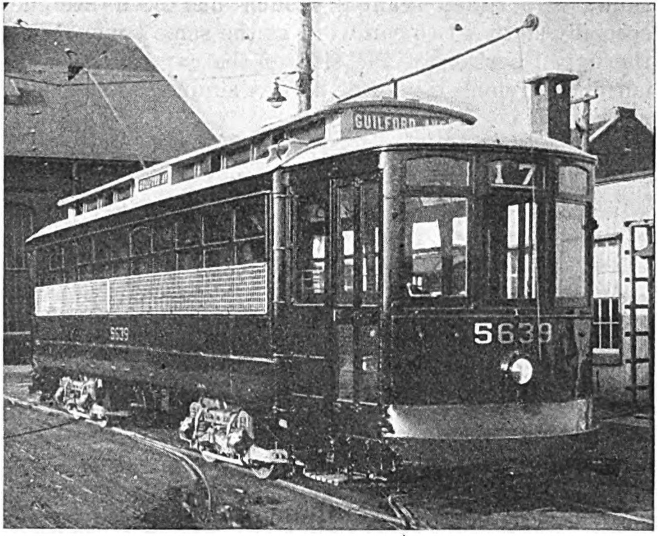
On the United Railways & Electric Company of Baltimore some years ago such a method was standard, and cars as turned out were indeed attractive. An accompanying illustration shows a car painted in that manner. The lower panel was in cream with an orange-yellow broad and fine stripe. The upper panel was painted in dark Tuscan red with an aluminum broad and fine stripe. The broad aluminum stripe was edged in black. The belt rail, corner posts and intermediate posts were in cream color and the letterboard in Tuscan red. The doors and sash were all natural cherry, filled and varnished. The numbering and necessary lettering were aluminum stripe with black edging.

Higher wages increased the cost, and combined with the great length of time the vehicle was in the shop, it was felt necessary to study some means to reduce time and cost. The older method required after the priming coat, which was usually a lead and oil mixture, with the oil percentage large, three or four coats of "rough stuff" or surfacers. Each required about 24 hours for drying. After the last of these coats had stood for 24 hours, a carefully trained painter with a rubbing block and water brought the car surface to a high degree of smoothness. Great skill was required to prevent rubbing more at some points than others, which would produce low places that would show up when the final varnish coats were applied. After this one or two coats of body color were put on, and then the successive coats of varnish, which were also rubbed down, until the final coat, usually of finishing varnish, was applied. The numbers, lettering and decorations were put on after the first coat of rubbing varnish.

Considerable study and experiment showed that a great reduction could be made in the cost of painting cars by substituting the glazing coat of oil and white lead, made of such consistency that it would dry hard and sand smoothly. It was also found that enamel could be substituted for flat color and varnish coats. Exterior surfaces in natural woods, varnished only, while very attractive when new were difficult to keep that way and as a rule soon perished. Today almost universally such surfaces are painted, then varnished, as is the rest of the exterior of the car. Lettering and striping have been eliminated generally, and such as remain are applied in the decalcomania form. As might be expected, with the former high cost of painting, together with a painting period of approximately fourteen days, it was not possible to pass many cars per year through the paint shop. Hence the periods for successive shopping for paint were two to three years. As an average this was too long for best results, and instead of cars being improved in condition, every so often the undercoats were so defective as to require burning off. This added still more cost and time to the car painting. As a result of experience with the practices that we are now pursuing, it has been found that it is quite possible, at a fairly small cost per car, to send the cars to the paint shop every twelve months. Such fairly frequent attention keeps the exterior painted surfaces in an excellent state of preservation.

Of course, there occurs today, as a result of the congestion of vehicles in the crowded streets of our large cities, an unusual amount of damage to exteriors of cars, so that, no matter what care or cost has entered into the preparation of a painting job, the vehicle is liable to damage that will decidedly mar its appearance. It is evident that the least expensive method of painting, giving good appearance, is preferable to a more expensive method giving results of the old-time carriage work.

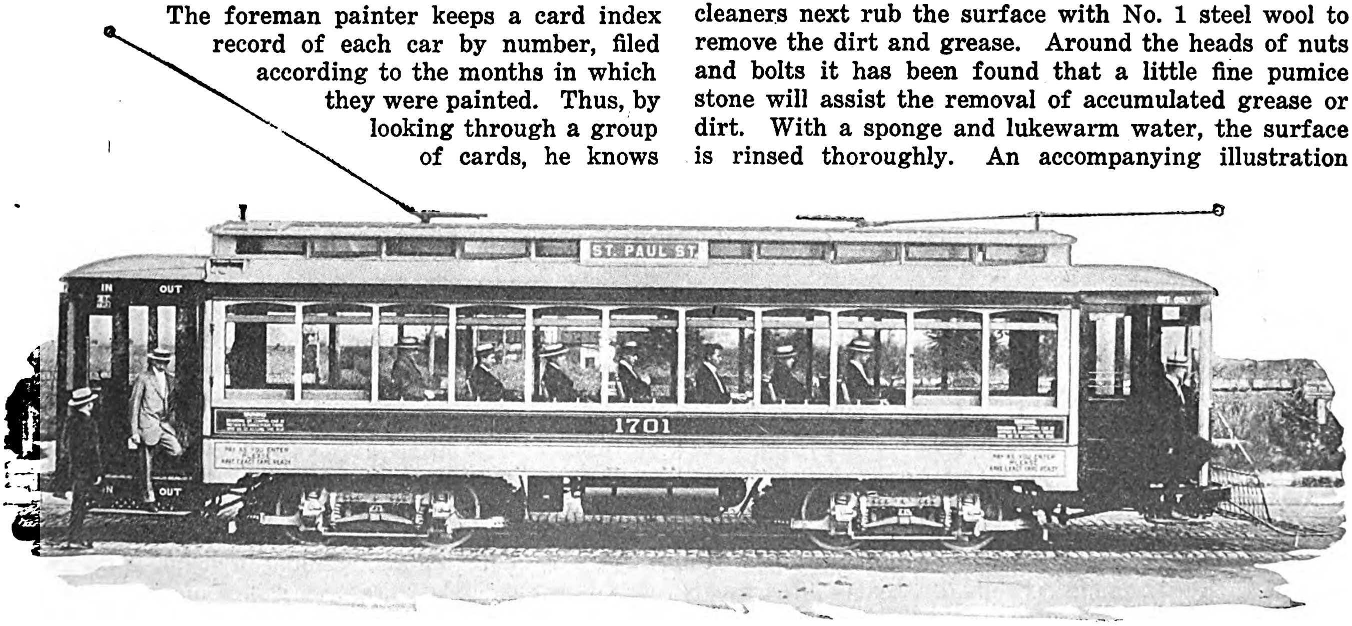
The following methods are now pursued in the painting of cars of the United Railways & Electric Company: The foreman painter keeps a card index record of each car by number, filed according to the months in which they were painted. Thus, by looking through a group of cards, he knows almost instantly those cars which should be sent to the shop for painting. He prepares a list which is turned over to the foreman of the motor and truck shop, who has charge of the transferring crews, and is thus provided with cars to work upon.



Simplified color schemes are the standard practice in Baltimore

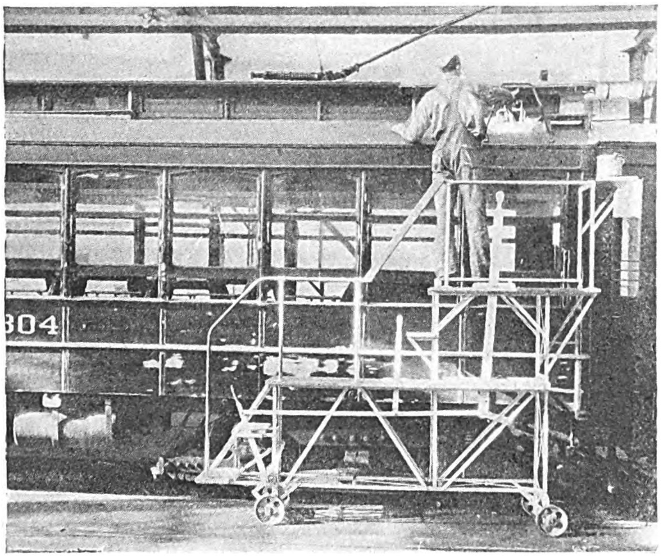
METHOD USED FOR PAINTING A NEW CAR

As the cars are brought to the paint shop they are examined by the carpenter shop representative, who fixes any loose or damaged panels or moldings, and does any other work of this nature required prior to painting. While this is going on the car trimmers remove seats, side-window screens and Hunter signs. In the meantime the roof painters have given the roof a coat of paint. A special type of portable scaffold has been found efficient for the painting of monitor sashes and side roofs. The car is cleaned on the outside, from top to bottom. In order that the car will clean more rapidly a coat of weak acid is placed on as much of the surface as is possible at one time with a 4 or 5-in. wall brush. Then follows a washing with liquid soap made of linseed oil and potash, put on with a brush. The cleaners next rub the surface with No. 1 steel wool to remove the dirt and grease. Around the heads of nuts and bolts it has been found that a little fine pumice stone will assist the removal of accumulated grease or dirt. With a sponge and lukewarm water, the surface is rinsed thoroughly. An accompanying illustration



Old-time painting methods gave much attention to striping and lettering shows a portable scaffold, which has been designed specially so that two can work at the same time. When the upper portion of the side of the car has been finished, the remaining lower half is similarly finished by working from the floor.

As soon as the car has dried thoroughly, all the surfaces which exhibit cracks, nail holes, scars or other imperfections are coated with a lead and oil primer. This is also done on the first day. Any new moldings or panels inserted have been previously painted, so that only in rare instances is new wood encountered. Under a separate heading will be found a description of the painting from the raw wood up. On the second day, the car is given a coat of red enamel, cutting around numbering, lettering, and other decorations. Following the coat of enamel the car is given one coat of finishing varnish on the third day. In some instances, where cars are in good condition, with the surfaces not scratched or marred, it is possible to varnish the car without a coat of red enamel, and this saves one day. After standing for 24 hours the car is ready to receive seats, window screens, Hunter sign curtains, and other trimmings. On the fifth day the car is ready to be returned to service.



A portable scaffold has been found particularly efficient when painting monitor sashes and side roofs

As soon as the exterior has been cleaned (usually the second day) the cleaners begin work on the interior of the car. Here great care is required. The use of acid is eliminated entirely and only upon exceptionally dirty spots is soap used. The work is begun on the ceiling, working down the sides of the car to the floor. The interior cleaning includes underside of hoods and vestibule ends. Accumulations of dirt, paper, etc., under longitudinal seats and such places are removed. After the interior cleaning has been finished, the paint shop foreman or his assistant examines the car and decides whether the interior condition warrants renovation or revarnishing. Should the varnished surfaces appear in good condition a special renovating oil is employed. If, on the other hand, the surfaces appear dull and unattractive, the car is varnished. The interior of the vestibule ends, however, usually receives such hard service that it is found desirable in nearly all cases to repaint the woodwork, using a solid color, imitation mahogany or natural cherry finish. Seat pedestals are bronzed; stanchions, hand brake supports, etc., are then painted or enameled, and finally, on the same day that the car is given a coat of clear varnish, the floors are painted, so that both are drying simultaneously. Before the car is put back into service, all the windows are cleaned carefully and the excess paint is removed with the use of an old razor blade.

PAINTING FROM THE RAW WOOD UP REQUIRES SPECIAL TREATMENT

The practices followed on a car from the raw wood up differ from those already described. To the raw wood is first applied a primer made of two-thirds raw linseed oil and one-third pure whitelead. This is colored pink by the addition of a small amount of Tuscan red. After this has been allowed to stand 48 hours it is sanded with No. 1 sandpaper. Then the second coat of primer made of half linseed oil and half whitelead, which has also been colored, is put on. This second coat is allowed to stand 24 hours and is then sanded with No. 1 sandpaper. The third coat of surfacer consists of one-third linseed oil and two-thirds whitelead, colored as previously described. This third coat, after being allowed to stand, is likewise sanded.

Generally speaking, there has now been provided a good, smooth surface. If, however, a still better surface is desired, a knifing coat of lead with a small amount of oil and turpentine is then used, which, after standing 24 hours, is smoothed down very carefully with No. ½ sandpaper. There is then applied a red undercoating, which is a quick drying, non-sanding surfacer. The next coat is the red body enamel. This is allowed to stand 24 hours and then the numbers, lettering, and other decorations are applied. Following this, the car is given two coats of finishing varnish with 24 hours between for drying.

The result of sending cars to the paint shop every twelve months is that very few cars require such treatment. The burning off of old paint under these conditions is also very rare.

The present paint-shop force includes one foreman, one assistant foreman, one inspector, twenty-two first-class painters, sixteen second-class painters, six third-class painters, three fourth-class painters, one first-class helper, five second-class helpers and twenty women.

ONE HUNDRED CARS A MONTH PAINTED IN BALTIMORE

The total number of passenger cars on the system is approximately 1,200 and with an average output of 100 cars per month it is possible to send every car through the paint shop each twelve months. The paint-shop force also does a great amount of work in painting automobiles, trucks and bus bodies. During 1926 a total of 49 were painted in addition to the cars. Considerable painting is also done by this force of all kinds of signs, also waiting stations and office sections of buildings. A quite extensive rerouting of cars resulted in making changes of more than 1,000 Hunter sign curtains.

Painting records show that the following are fair estimates of cost: To paint the exterior and varnish the interior according to the old methods, including numbering, lettering and striping in vogue at that time, would cost on today's rate of wages and price of materials between $250 and $275 per car. To bring up a car from the raw wood following present-day practice

considerable investigation of this problem, especially along the line of producing a spray gun which will atomize the paint, varnish or lacquer, but will control the spread of the finely-divided particles. So far, the use of spray painting has been confined to the painting of large surfaces, such as walls, partitions of buildings, car body trucks and generally where the fumes would not be of extreme annoyance.

Experiments and tests have also been made with the use of long oil enamels. Generally speaking, these results have not been at all satisfactory because of two conditions. First, there is a longer and uncertain period required for the drying. Instances have occurred where as long a time as five days was needed for a single coat to dry. Secondly, without a coat of varnish over the coat of enamel, great care must be exercised in the kind of cleaners used at terminals. It has been found that such enamels are injured by any acid cleaners.

The company has for its heavy service lines quite a number of front-entrance cars of the Birney safety type and articulated cars arranged for front entrance especially designed by the railway. In order to acquaint the riding public with cars that load at the front, all front-entrance cars are painted in cadmium yellow, the rear-entrance cars using the standard red color.

RECORDS OF PAINTS USED KEPT BY GLASS SAMPLES

The need for records on paints of different kinds is met by providing a small cabinet holding a large number of pieces of glass approximately 3 in. x 5 in. in size on which samples of any new paints are placed, together with an identifying number and a record of who furnished and when. This makes it very easy to check up on the delivery of paint materials as to body and color. Samples are also kept in a similar manner of paints made in the paint shop, with the formula, so that at all times such materials can be reproduced exactly as to color and general consistency.

The liberal use of paint in the paint shop is encouraged with the view of keeping a clean, fresh and attractive appearance. It is believed that such expenditures, although small, have a beneficial effect upon the morale of those working in such surroundings. It also produces an inviting atmosphere to those who, upon occasion, visit this part of the railway system.

Since the war, the greater portion of the car cleaning preparatory to painting on our system is being done by women. This was brought about by the shortage of man-power. Women are also employed in the paint shop to clean windows preparatory to sending the car out for services.

Constant tests of paints, oil and varnishes are being made under supervision of the foreman of the paint shop, usually in the form of test panels. These test panels are prepared carefully under his supervision and a record of the materials and their method of use carefully noted. The test panel is then numbered, dated and placed out for exposure. Removal of test panels is not permitted without instructions from the superintendent and a record is made of the conditions upon removal. Generally speaking, paints are exposed for twelve months, and varnish and similar materials for eighteen months. Color combinations are under constant consideration, with the view of obtaining an attractive color scheme with a cost equal to or less than that existing at present.

Poor Tools May Cause Injury

POOR quality tools, good tools impaired and the improper use of tools account for about 11,000 casualties yearly among railroaders of the United States. A study of "tool accidents" on a single representative railroad has disclosed that 89 per cent of injuries are chargeable to tools. They come under four leading causes: Struck by tools in hands of self or others, 33 per cent; bars slipping, 25 per cent; jacks slipping or falling, 16 per cent; wrenches slipping, 15 per cent; various other causes, 11 per cent.

In one year there were 3,868 compensated accidents recorded in New York State, each caused by the misuse of hand tools, or defects in such tools—proof that safety is of vital importance to the user of tools.

Slight yearly reductions in the annual toll from tools used carelessly indicate a lessening of the general hazards, but the fact that tool accidents are mostly confined to shops, stores, tracks, bridges, and buildings where men work in groups under the close surveillance of their foremen and where safety supervision is easy to provide, makes it evident that a greater improvement is possible with better co-operation between workmen and foremen. Tool accidents will decrease to the extent that supervision and co-operation become effective.

Burred and feathered chisels and sledges, hammers and shovels that are loose on their handles, wrenches with spread or worn jaws and jacks with defective ratchets are an index to the efficiency of those who use them as well as to those who supervise the work in which they are being used.

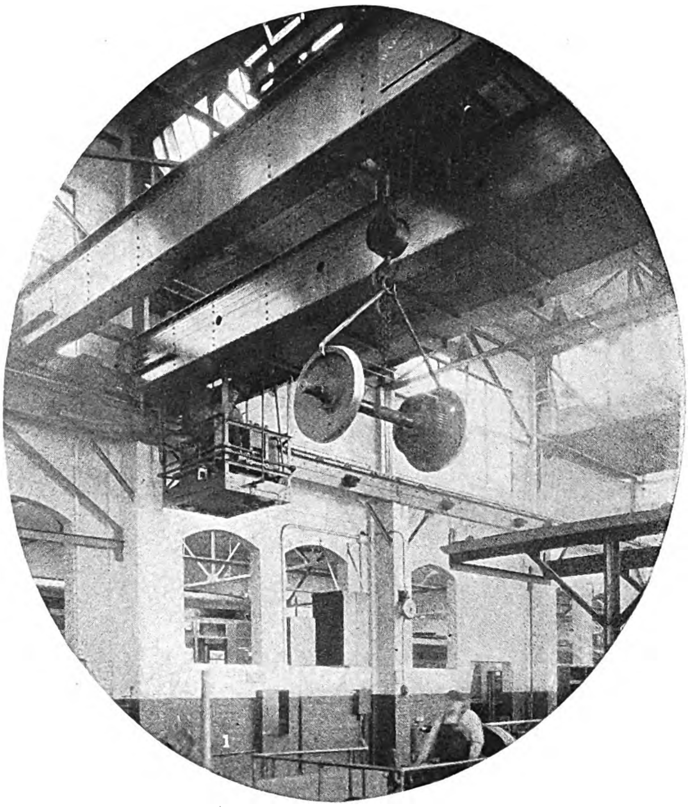
Improper use of tools, even though dangerous, will be discontinued only when foreman and workmen have a mutual understanding that such practices will not be tolerated. To be effective it must be understood by all that the foreman's instructions are to be enforced, and that if necessary the workman who refuses to abide by them will be disciplined.

New Shops of Chicago Rapid Transit Company Will Occupy 15 Acres

TEN separate shop units are planned by the Chicago Rapid Transit Company to be located at Niles Center. They will cover upward of 15 acres and are laid out and connected with each other so as to afford the utmost efficiency in handling cars. When the elevated railroads were operated as four separate companies each road had its own shop and there was no provision for an interchange of equipment. That condition had to be continued as a matter of necessity after the companies were consolidated. When the new shops now under construction are completed they will have a capacity sufficient to care for all the present equipment, and provision is being made for adequate expansion. The present shops will be used for purposes of inspection and minor repairs.

Work on the first unit of the shops is progressing rapidly and it is expected that it will be completed in May. This unit is the paint shop. It will be followed by other units from time to time until all of the shops are completed. The building now under way is 200 ft. by 224 ft. in outside dimensions. The walls are of Old English mission brick with cast stone trimmings. All of the buildings to follow will be of the same design. This will give them an attractive appearance, in keeping with the neighborhood.

Glimpses into the new B.-M.T. Repair Shop



AN ELECTRIC RAILWAY SHOP equipped completely with the latest machine tools and other modern equipment is an inspiration to men responsible for electric car maintenance. Such an example is furnished by the new DeKalb Avenue repair shop of the Brooklyn-Manhattan Transit Corporation.

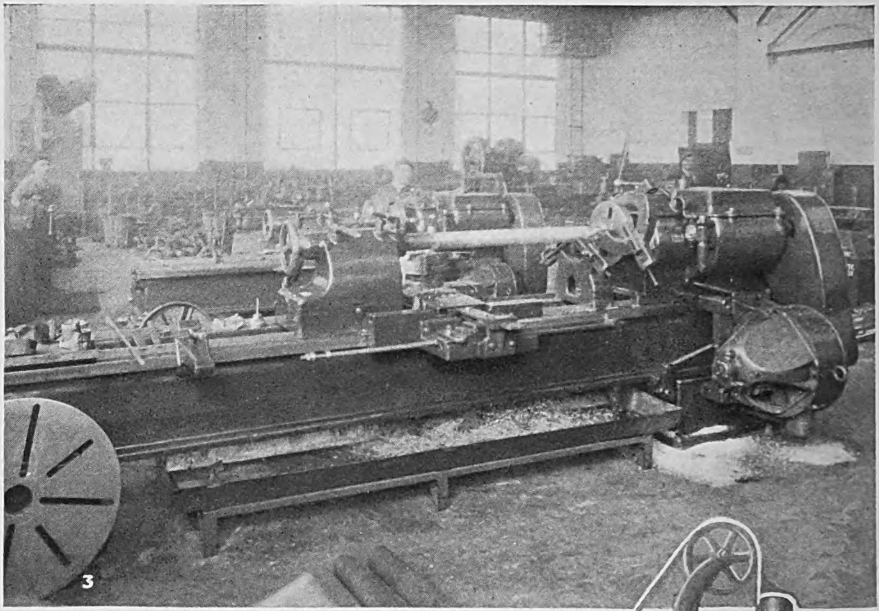
Prior to June, 1926, all maintenance work on surface cars for both the above corporation and the Brooklyn City Railroad was consolidated under one head. The separation of this work for the two companies made it necessary for the Brooklyn-Manhattan Transit Corporation to have increased facilities. The DeKalb Avenue shop was rebuilt and enlarged and the very latest shop equipment that could be obtained was installed.

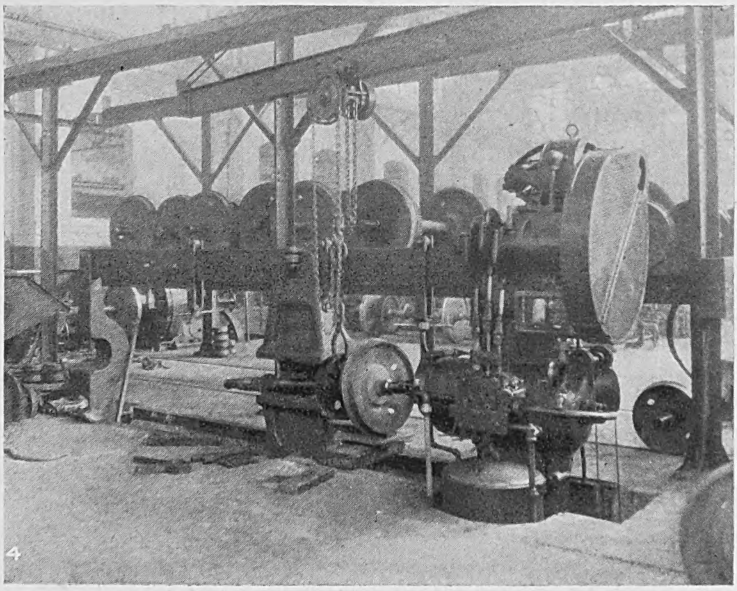
Like other officials of city railway systems, those of the Brooklyn property felt that suitable facilities and shop equipment for maintenance work are essential to safe and reliable car service. Particular attention was given to the selection of machine tools. Experts studied the various machining operations that are necessary for car repairs, improvements were added and several special machines were built by manufacturers to meet the specific class of work. Each machine is provided with individual electric drive. Work and materials can pass through the shop without delay, floor space can be used to the best advantage and any congestion at one machine does not interfere with independent operation of another.

The accompanying illustrations show some of the apparatus of this extensively equipped shop. At the top of this page one of the 10-ton cranes is shown serving the hydraulic wheel press. A general view of the truck overhauling bay with the machine shop at the rear is shown below.

The Wheel and Axle Department *is a busy section*

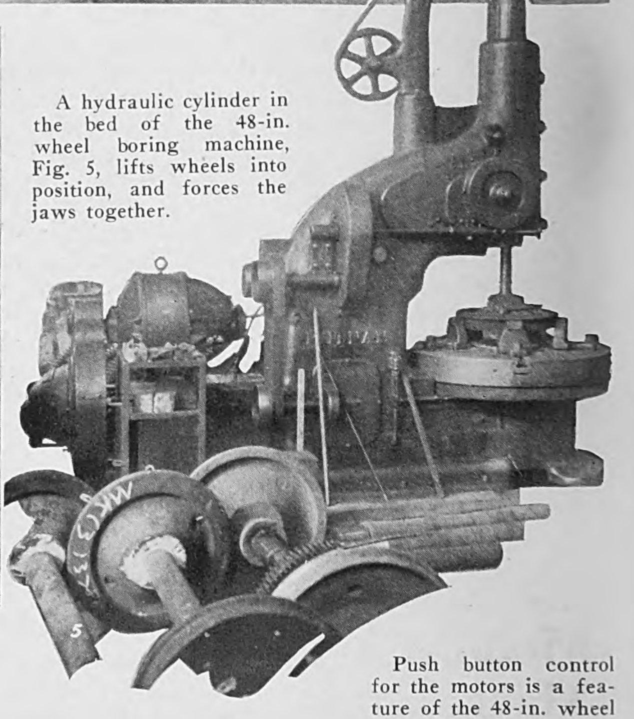
The helical geared ball bearing lathe, Fig. 3, is used almost entirely for turning armature shafts. It is large enough to take the broom shafts of sweeper equipment.



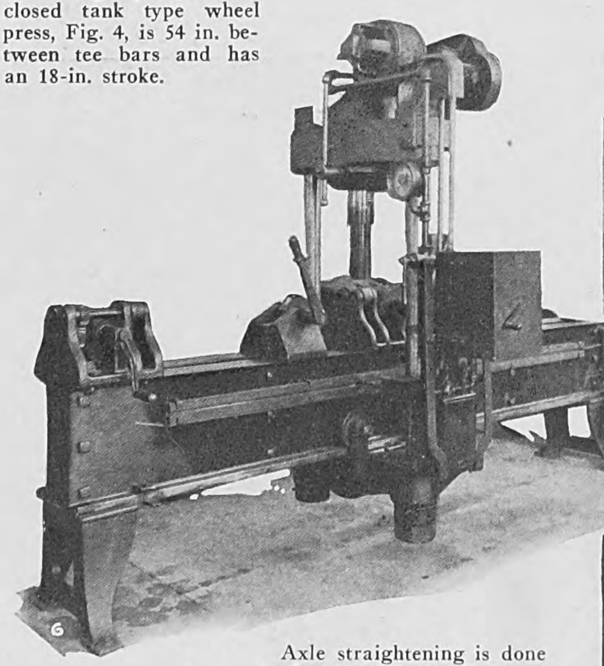


The high-speed, 300-ton closed tank type wheel press, Fig. 4, is 54 in. between tee bars and has an 18-in. stroke.

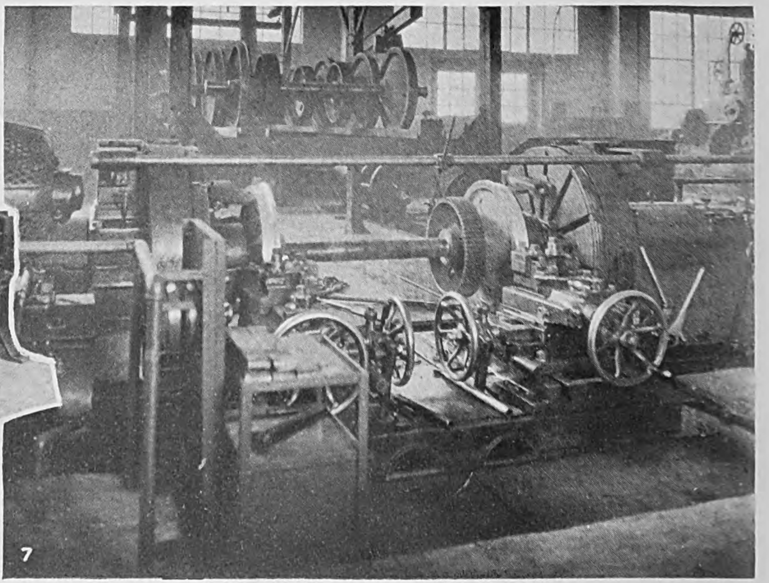
A hydraulic cylinder in the bed of the 48-in. wheel boring machine, Fig. 5, lifts wheels into position, and forces the jaws together.



Push button control for the motors is a feature of the 48-in. wheel lathe, Fig. 7.

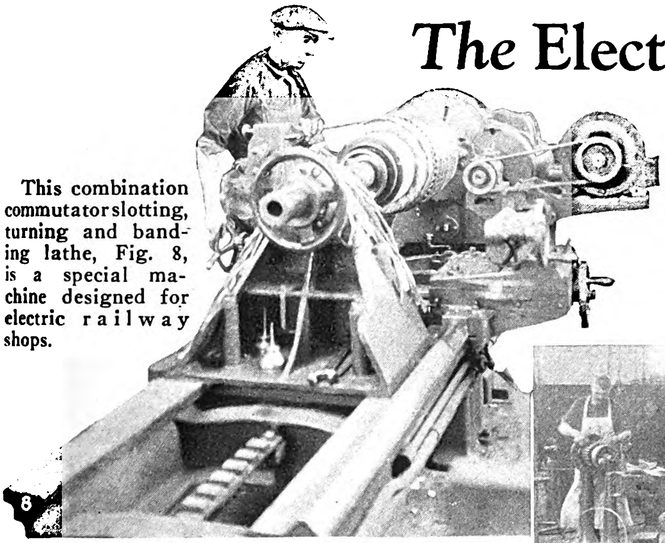


Axle straightening is done in the 125-ton hydraulic press, Fig. 6.

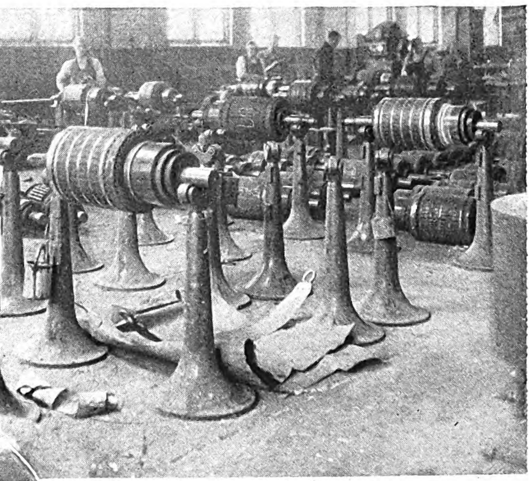


The Electrical Repair Department

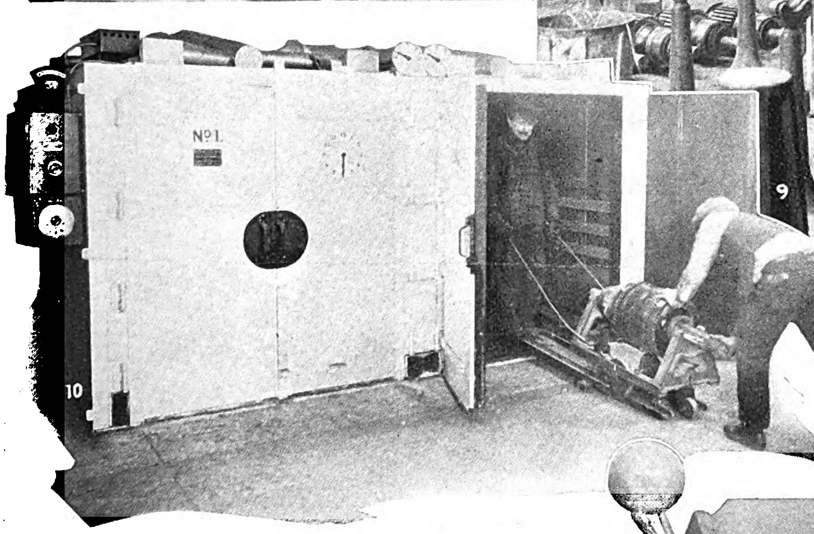
is completely equipped for maintenance of all motor and control apparatus



This combination commutator slotting, turning and banding lathe, Fig. 8, is a special machine designed for electric railway shops.



Conveniently arranged armature stands facilitate work of rewinding, Fig. 9.

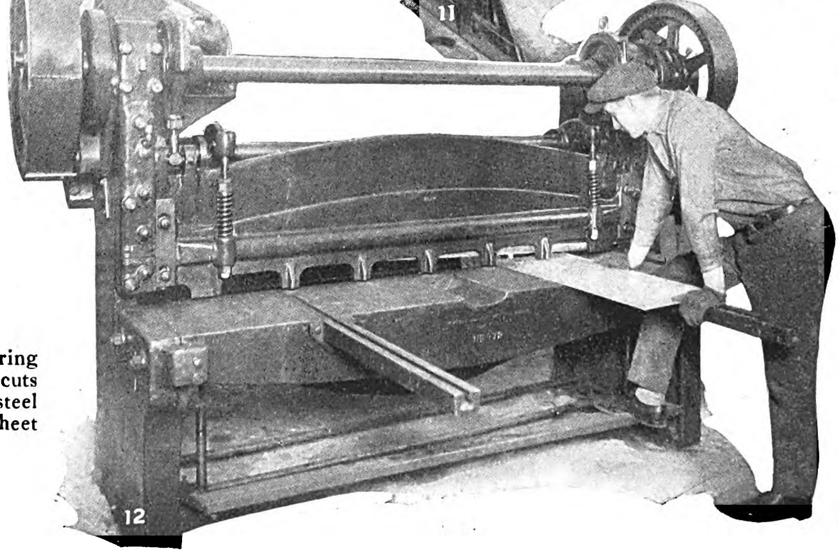


The baking and drying ovens, Fig. 10, have thermostatic heat regulation and clock control for turning off the heat.

Steel car repairs require

Modern Sheet Steel Machines

A hand bending brake shapes sheet steel for splash guards and sand boxes, Fig. 11.

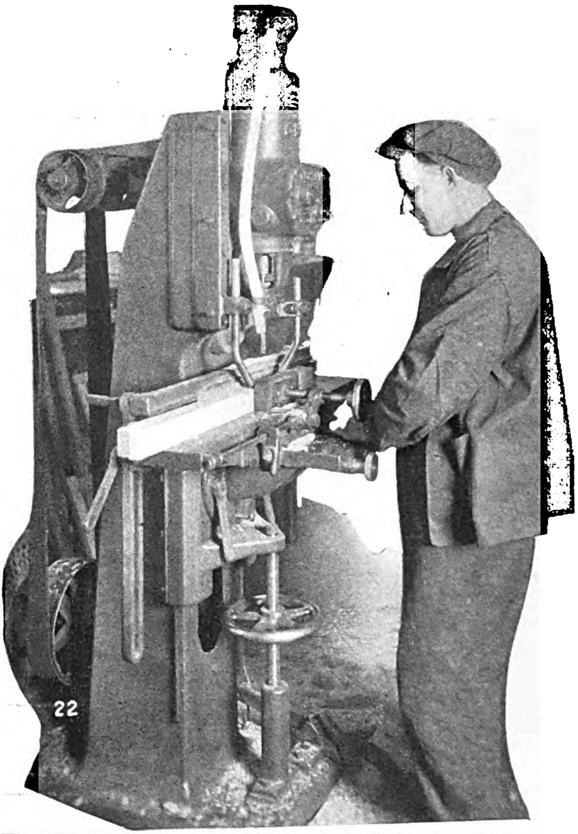


The power squaring shears, Fig. 12, cuts side sheets for steel cars and other sheet metal work.

Modern

Wood-Working Machines

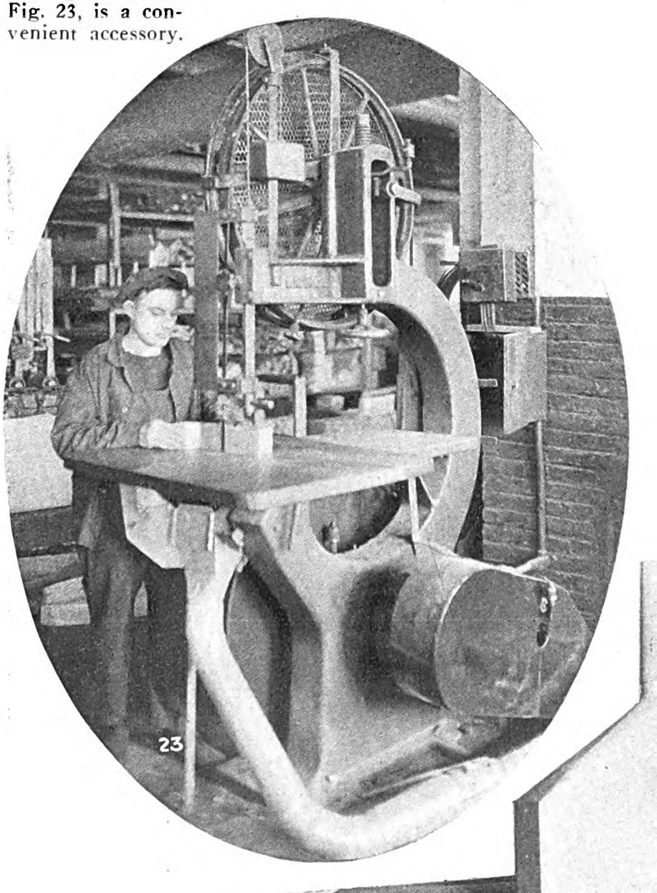
eliminate much hand work



22

Stiles and rails for sash and doors are mortised on this automatic vertical hollow chisel mortiser, Fig. 22. It has a power stroke for the chisel ram.

The 36-in. band, scroll and rip sawing machine, Fig. 23, is a convenient accessory.



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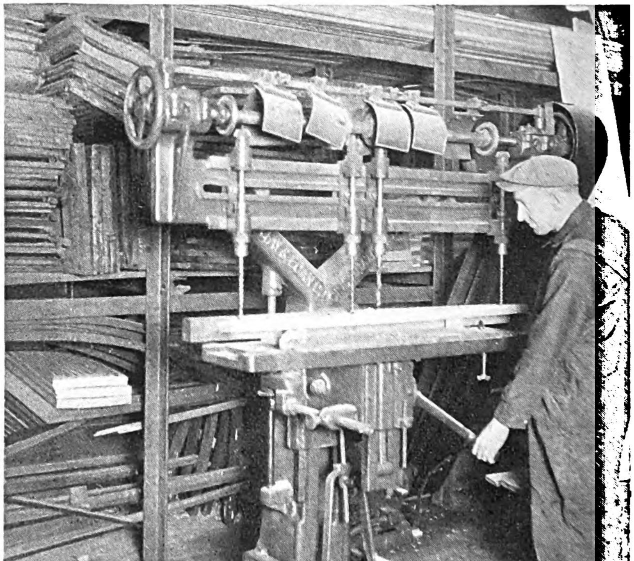

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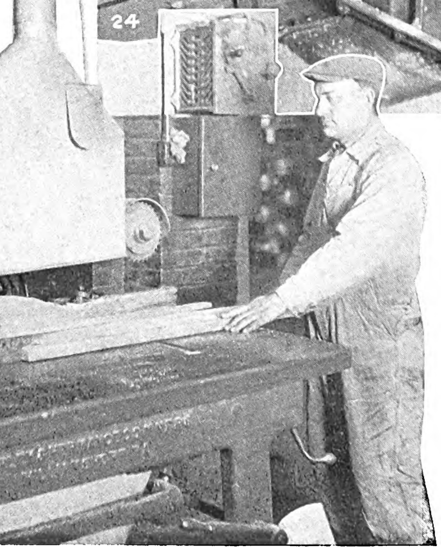
This four-spindle boring machine, Fig. 24, has a vertical adjustable table.



25

Material is cut quickly into slats and narrow widths on the automatic self-feeding rip saw, Fig. 25.

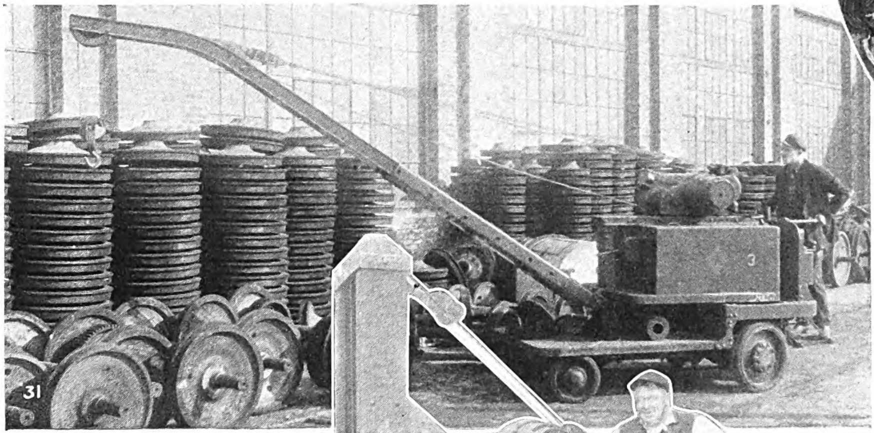
Electric Trucks *are a great convenience for material handling*

A crane truck, Fig. 31, handles heavy parts in the material storage yard.

Small material is moved quickly by trucks, Fig. 32, with stationary platforms.

Controllers, compressors and other car equipment can be placed on work benches by one man with the elevating platform truck, Fig. 33.

32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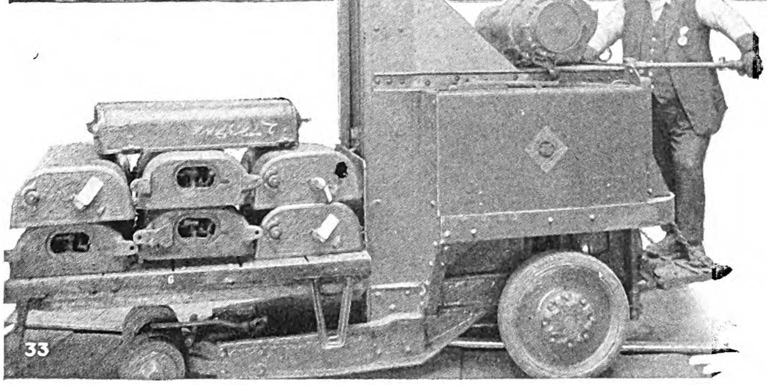
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34

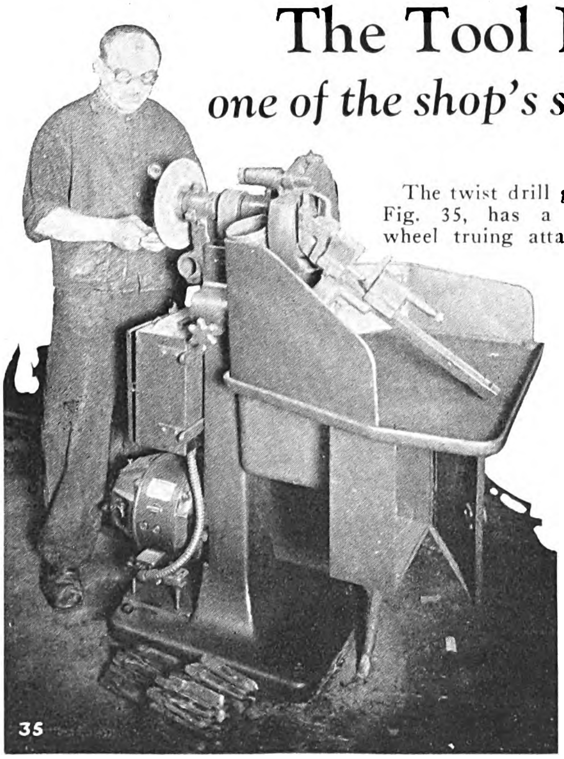
The Tool Room

one of the shop's show places

Cylindrical, internal and surface grinding are done on the universal cutter and grinder, Fig. 34.

Many operations are done economically on the universal milling machine, Fig. 36.

The twist drill grinder, Fig. 35, has a special wheel truing attachment.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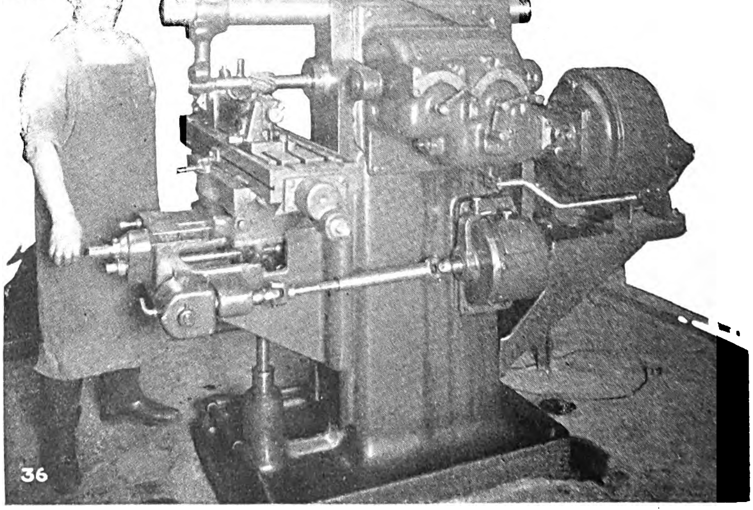

36

Electrical Maintainers Are Not Trouble Men

Successful Maintenance Should Keep Property and Equipment in Such a State of Repair that There Are No Reports of Trouble—Rigid Inspection at Regular Intervals Has Produced Gratifying Results in Chicago

By Dwight L. Smith

Electrical Engineer Chicago Rapid Transit Company, Chicago, Ill.

PROBLEMS in electrical maintenance that require daily solution on the lines of the Chicago Rapid Transit Company are quite different from those of the average city property, but similar procedure and organization can be used by most railways. The route-miles operated total 77 and the single-track miles 217. As most of the track is on elevated structures with third rail and as there are 224 passenger station buildings and an extensive private telephone system maintenance work is quite varied in character.

The electrical department is responsible for all electrical maintenance except that of rolling stock, signals and interlocking. The principal items include the following:

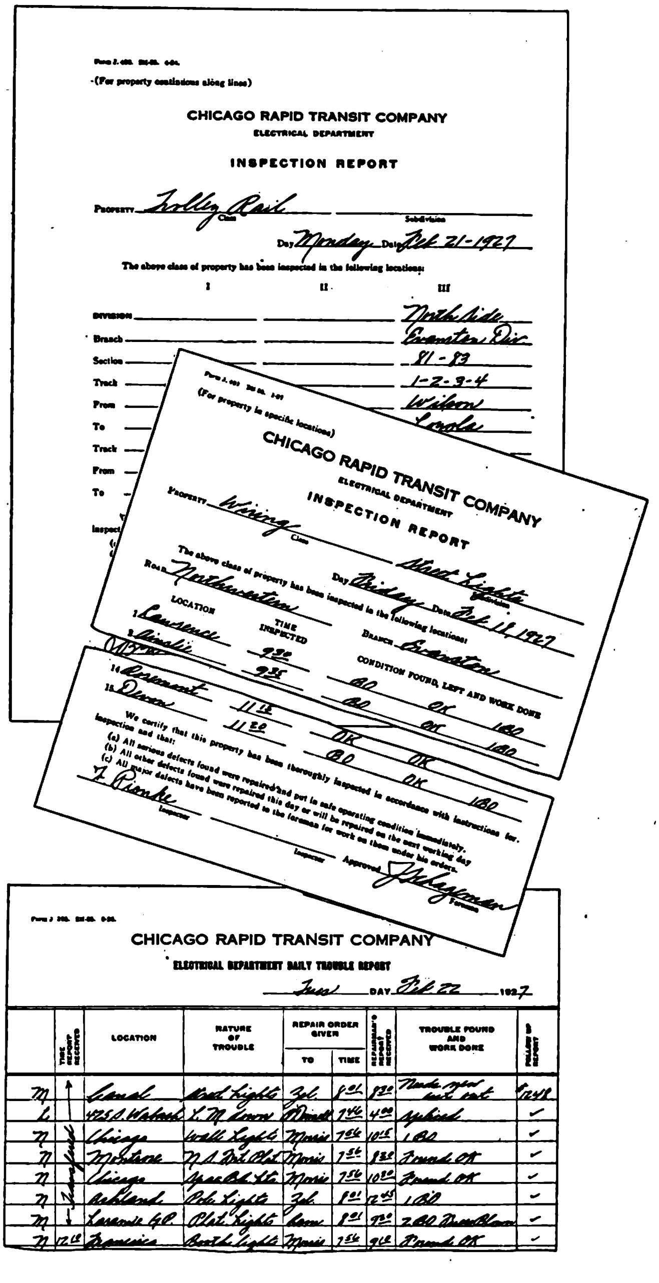
Third rail	200 miles
Overhead trolley	17 miles
Telephone cable	66 miles
Telephone instruments	575
Feeder cable, underground and overhead	286 miles
Street and yard lights	1,010
Electric sign lights	1,560
Station and building lights	27,130
Storage batteries (railroad)	6
Substations (owned by railroad)	5

Despite the magnitude of this task it is accomplished with a force of less than 50 men and the property is not only well maintained but its physical condition is being bettered continually.

Some years ago these maintenance workers were called "trouble men," with the natural result that they believed their work was to take care of only such trouble as was reported. Now the word "trouble" is taboo, the men are known as "maintainers" and their efforts are directed toward keeping property and equipment in such a state of repair that there are no reports of trouble.

A thorough system of inspection is a big factor in approaching this goal. Every item in every location is given a rigid inspection at regular intervals, varying from once a day to annually, based on the type of property and the location. This system is laid down in detail in the inspection manual with which each maintenance foreman is furnished and which he uses as a text book to school his men. In the manual there is a division of the property into classes and groups and the railroad is classified into zones, according to the density of traffic. A definite interval for inspection is assigned for each class and group of property, varying with the zone; for instance, subway lights and signs are inspected daily, third rail in the central zone bi-weekly and bonding in yards annually.

On some classes of inspection, principally those which come at longer intervals, the exact dates are left to the discretion of the foreman to fit in with his work.



(For property continuous along lines)

CHICAGO RAPID TRANSIT COMPANY
ELECTRICAL DEPARTMENT
INSPECTION REPORT

Property Trolley Rail Class
Subdivision
Day Monday Date Feb 21-1927

The above class of property has been inspected in the following locations:

	I	II	III
Division			North Side
Branch			Evanston Div.
Section			81-83
Track			1-2-3-4
From			Wilson
To			Loyola
Track			
From			
To			

(For property in specific locations)

CHICAGO RAPID TRANSIT COMPANY
ELECTRICAL DEPARTMENT
INSPECTION REPORT

Property Wiring Class Street Lights Division
Day Friday Date Feb 11, 1927

The above class of property has been inspected in the following locations:

Road Northwestern Branch Evanston

LOCATION | TIME INSPECTED | CONDITION FOUND, LEFT AND WORK DONE

1 Lawrence 9 30 B.O.
2 Ainslie 9 35 B.O. OK 1 B.O.
14 Rosemont 11 15 OK OK 1 B.O.
15 Devon 11 20 B.O. OK 1 B.O.

We certify that this property has been thoroughly inspected in accordance with instructions for inspection and that:
(a) All serious defects found were repaired and put in safe operating condition immediately.
(b) All other defects found were repaired this day or will be repaired on the next working day
(c) All major defects have been reported to the foreman for work on them under his orders.

F. Rianke
Inspector
Inspector
Approved
Foreman

CHICAGO RAPID TRANSIT COMPANY
ELECTRICAL DEPARTMENT DAILY TROUBLE REPORT

Tues DAY Feb 22 1927

	TIME REPORT RECEIVED	LOCATION	NATURE OF TROUBLE	REPAIR ORDER GIVEN TO	REPAIR ORDER GIVEN TIME	REPAIRMAN'S REPORT RECEIVED	TROUBLE FOUND AND WORK DONE	FOLLOW UP REPORT
M		Canal	Street Lights	Zol.	8 01	9 30	Needs new cut out	1248
L		425 S. Wabash	L. M. [illegible]	[illegible]	7 46	4 00	Spliced	✓
N		Chicago	Wall Lights	Morris	7 56	10 15	1 B.O.	✓
N		Montrose	N.S. [illegible] Plat.	Morris	7 56	8 30	Found OK	✓
N		Chicago	[illegible]	Morris	7 56	10 30	Found OK	✓
N		Ashland	Pole Lights	Zol.	8 01	12 45	1 B.O.	✓
M		Laramie G.P.	Plat. Lights	[illegible]	8 01	9 30	2 B.O. [illegible]	✓
N	12 15	Francisco	Booth Lights	Morris	7 56	9 15	Found OK	✓

Fig. 1 (at top)—Inspection report used for property along lines

Fig. 2 (in center)—Form used for reporting results of inspection

Fig. 3 (at bottom)—The trouble sheet serves as a permanent record of cases as reported

Otherwise a schedule of dates for each inspection is published periodically in a bulletin, and no deviation from them is permitted. This is notably the case with trolley wire, where inspections must be made at night and where both foremen and inspectors were prone to postpone the date if any reasonable excuse offered. Now no excuse is deemed adequate.

Not only does the manual assign regular periods for inspection but it includes a catechism for each class and group of property. A series of questions indicates what possible faults are to be looked for and the answers tell what is to be done when any of these faults are found.

The inspectors in general do the maintenance work. Small faults found by them are repaired on the spot. Larger faults are reported to the maintenance foreman, who arranges for the necessary men and material for the repair. Faults too large to be taken care of by the maintenance forces are reported by the foreman to the office for inclusion in the construction schedule. The seriousness of any fault discovered determines the celerity with which it is repaired. Emergencies are reported immediately by telephone and the necessary men and material are despatched at once.

Reports of routine inspections are made out by the inspectors, approved by their foreman and forwarded to the office, where they are noted by the electrical superintendent and then recorded. This record shows the dates of inspection of each class and group of property in each location. A frequent check-up serves to show whether inspections are being kept up to the required interval. The forms used in reporting inspections are shown in Figs. 1 and 2.

In line with the policy of prevention is the practice of anticipating possible trouble caused by necessary interference with electrical property by the work of other departments. This information is given through an exchange of work orders, by written and telephone reports and by close liaison between the supervisory forces of the departments. In some cases the interference can be eliminated temporarily while work is going on. A close watch always is kept and inspections are made more frequently than normally.

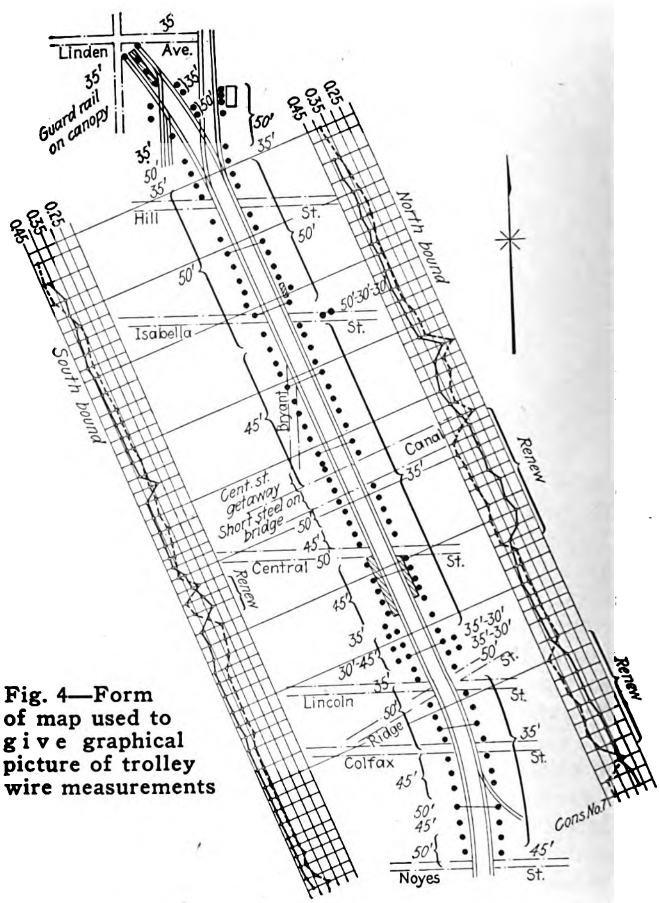


Fig. 4—Form of map used to give graphical picture of trolley wire measurements

Maintenance men are grouped into gangs of from six

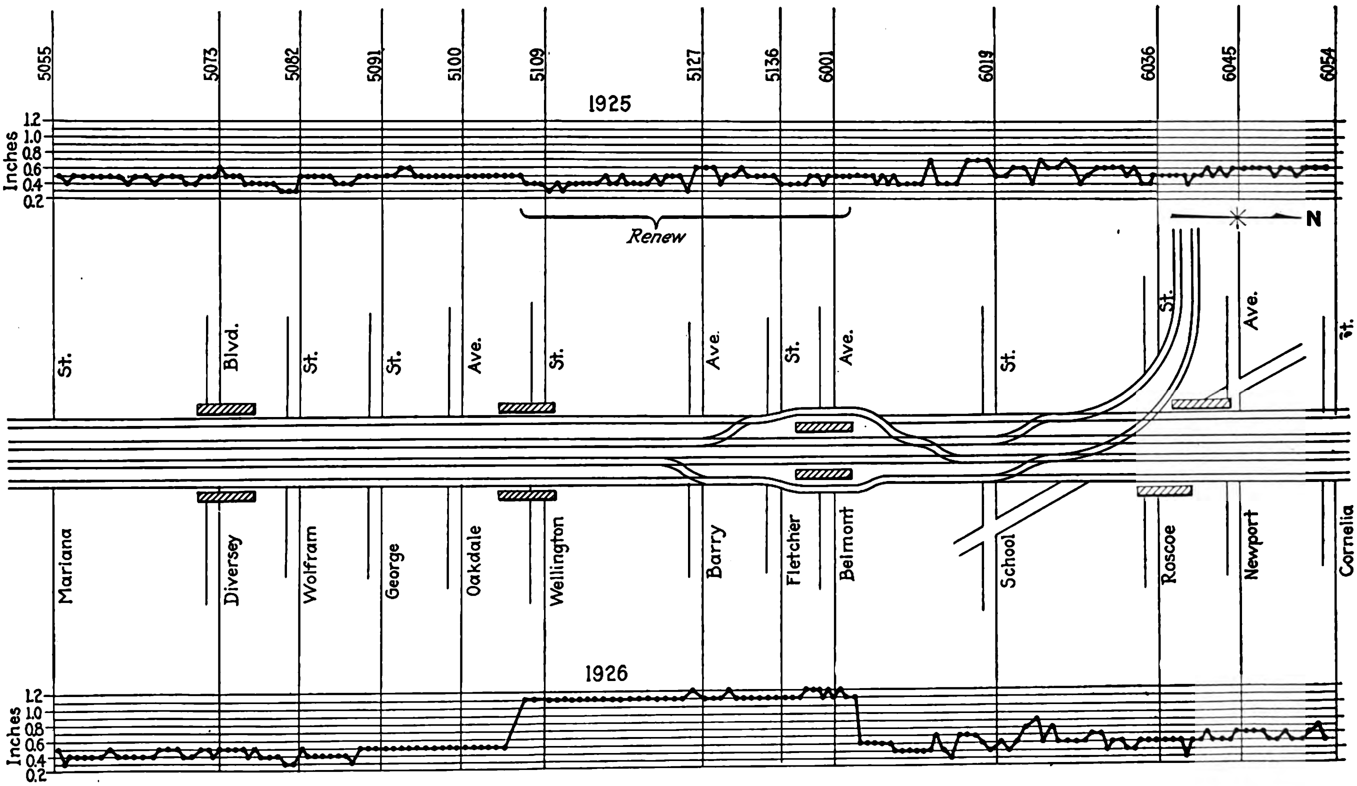
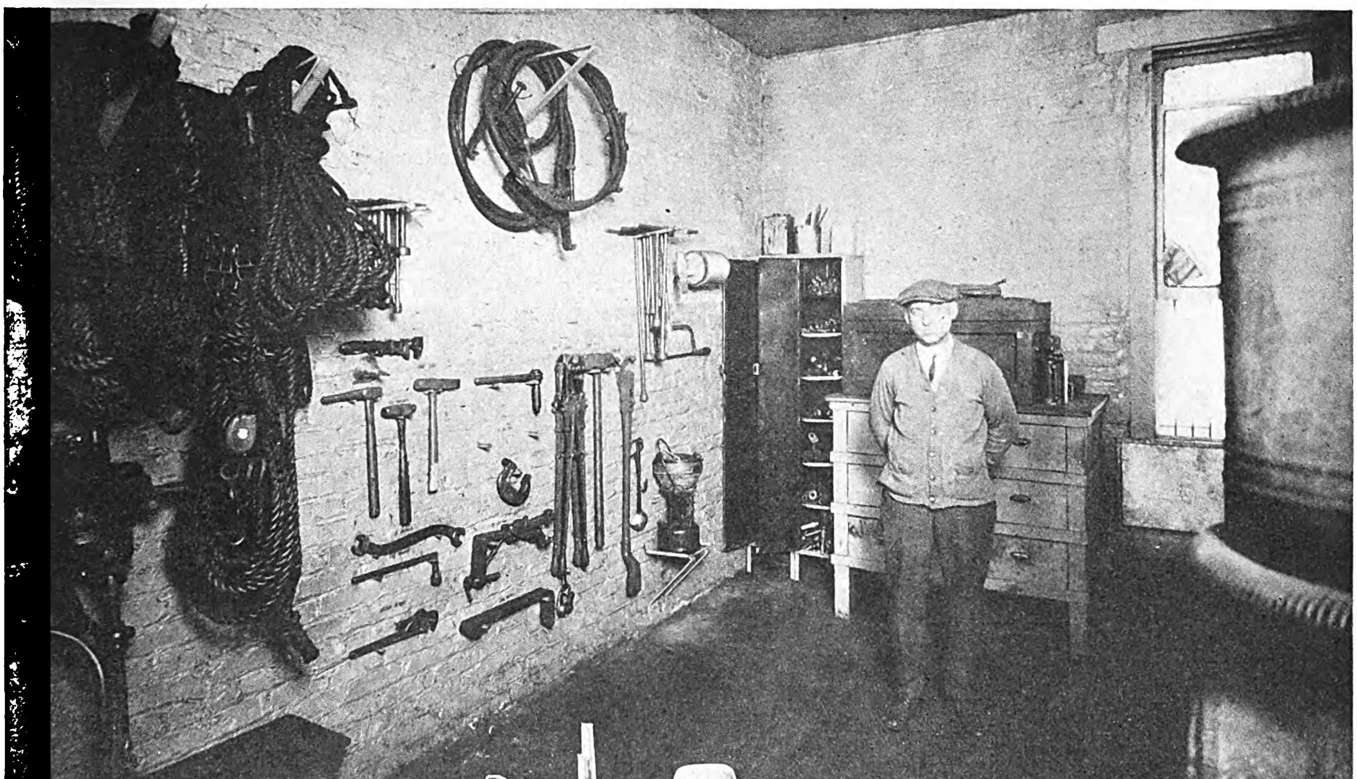
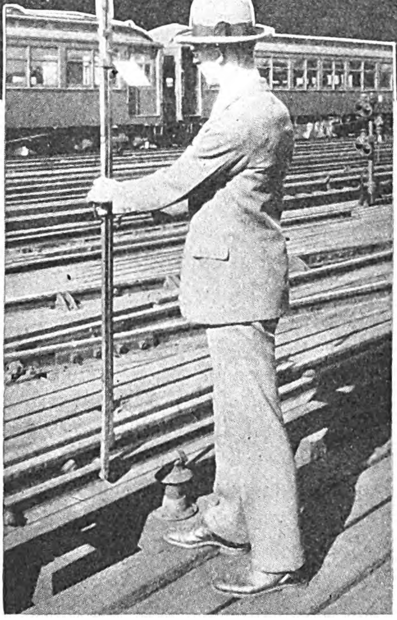


Fig. 5—Map and graphs are used to show third rail measurements



The maintenance shops serve as headquarters for the men—they report and quit work at the shop



The illustration at the left shows method of measuring the thickness of head of the third rail

to eight, each in charge of a foreman. There are five such, one for third rail, one for telephone, one for cable and one for line work, small wire and lighting. These four gangs not only do maintenance but minor items of construction, and work over the entire system. Each has a maintenance shop as its headquarters and as the men work one place today and another tomorrow, they report and quit at their shop. Each shop is equipped with the necessary tools and a working stock of material which is taken out as needed.

The fifth gang includes the maintainers, who are assigned to divisions and branches of the road and who, in general, work singly, but are always on hand in their assigned territory. A large part of the work of these men is replacement of burnt out lamps and taking care of trouble as it is reported, but in spite of this, the term "trouble man" is avoided and they are known as "maintainers." Each of these men has a headquarters at the geographical center of his territory. There he keeps his necessary small tools and stocks of lamps and material, arranged neatly in steel cases. The foreman of this group acts largely as an inspector, spending time with each of his men in turn, checking up their practices and standardizing their methods. He is responsible for keeping their headquarters supplied with the necessary stock of materials, which are ordered from and delivered by the electrical materials man.

The first four gangs mentioned are on duty only during regular working hours. The fifth one not only has a day shift but has a second shift of two men who are on duty up to 1 a.m. with a consolidation of territory. Between 1 a.m. and 8 a.m. the small amount of maintenance necessary other than that regularly scheduled is cared for by men acting in the dual capacity of signal and electrical maintainers.

The costs of maintenance work of each class are kept by the cost clerk on maintenance work orders. These cover twelve-month periods ending Oct. 1 so that the data are ready for use in making the budget for the succeeding calendar year.

The power supervisor acts as work dispatcher and clearing house for all electrical trouble. He can reach by telephone every point on the system. All foremen and maintainers keep him informed as to their whereabouts, all electrical trouble is reported to him and he can reach the proper personnel quickly to cover any emergency. The territorial maintainers are directly under his control at all times, receive from him trouble assignments in their territory and report back on each case and to get their next assignment. A "trouble sheet" kept by the power supervisor serves to record cases as reported, designates assignments and "OKs" with the time that the order is given. This becomes a permanent record kept on file for three years and to which reference is frequently made. This is shown in Fig. 3.

The maintainers on the afternoon trick have a large territory and skillful routing by the power supervisor

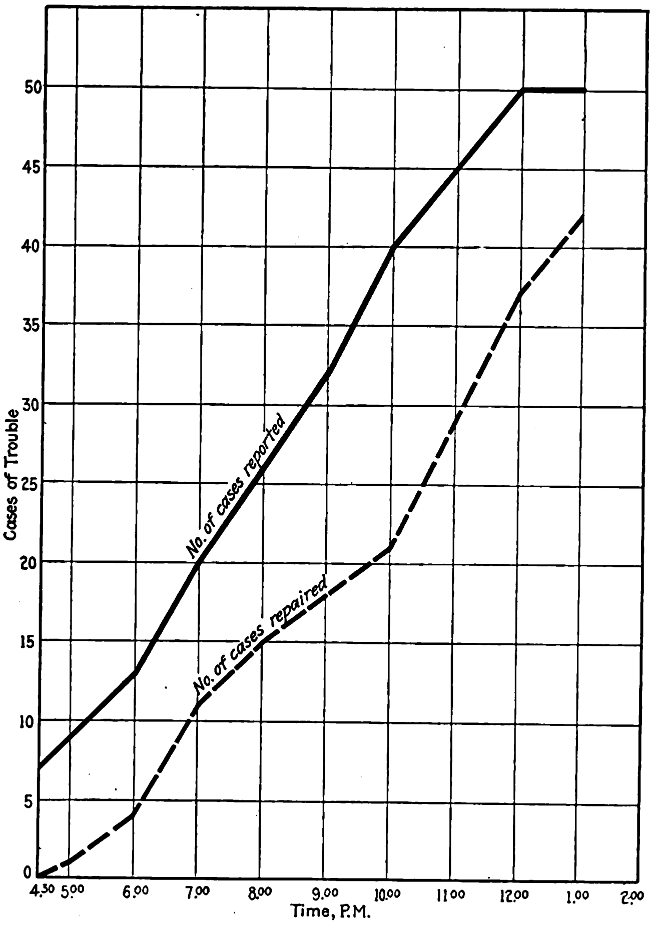


Fig. 6—Graph gives a continuous record of cases reported and repaired

is necessary to enable them to cover all reports. He keeps a graph of the number of defects reported and repaired. Fig. 6 gives such a graph. This is of value to provide a constant picture of how the work is progressing.

Sometimes the territorial maintainer can make only temporary repairs which are safe enough for operation for a few days. When such repairs are made a "follow-up slip" is filled out by the power supervisor and sent to the foreman of the appropriate maintenance gang, which makes the repair permanent.

The Chicago Rapid Transit lines are a consolidation of five properties, each of which originally used a different standard of construction and materials. Since the consolidation universal standards have been laid down to which all new construction and rehabilitation conform. Many of the old parts must still be kept in stock for maintenance, which makes quite a variety of maintenance materials, but standardization is progressing gradually.

Renewals are really wholesale maintenance, but there is a definite point, determined by an economic balance, where smaller repairs should stop and larger renewals begin. In determining this point the first requisite is accurate information; estimation will not do. The service on this road is so severe that in places No. 0000 hard drawn copper trolley wire has a life of only eighteen months. To determine when renewals are necessary and their extent the trolley wire is calipered in each span with a micrometer caliper about every 50,000 wheel passes, the passes being measured by an automatic contactor-operated counter. These measurements are plotted on a map and a study of this record gives the desired information. Fig. 4 shows such a map. Where weak spots are found which do not as yet require renewal they are calipered at more frequent intervals. This plan has enabled the company to keep wire in service until worn to 40 per cent of its original area, without a wire break in 2½ years due to wear.

The useful life of the original installation of third rail is just being reached. The same method has been used to determine the necessity for renewal, the rail head being measured for thickness every rail length and the results similarly plotted. The gage used for this measurement was designed and built by the department. It is arranged so that the operator is insulated from the rail, can place his gage on the rail without stooping and take his reading from a scale at the height of his eyes. A small clipboard attached to the upright holds the sheets on which the readings are recorded. The resulting graph is shown in Fig. 5. This method has resulted in renewals of comparatively short lengths where absolutely needed, rather than the previous practice of renewing long lengths which were estimated to require it, only to find that a part of the rail renewed still had several years of useful life.

Throughout this system of maintenance the keynote is inspection—catch the possible faults before they occur and remedy them. The result has been that delays because of electrical faults are now almost unknown, and that in spite of the continued addition of property the maintenance man-hours are steadily decreasing.

Modern Cars and

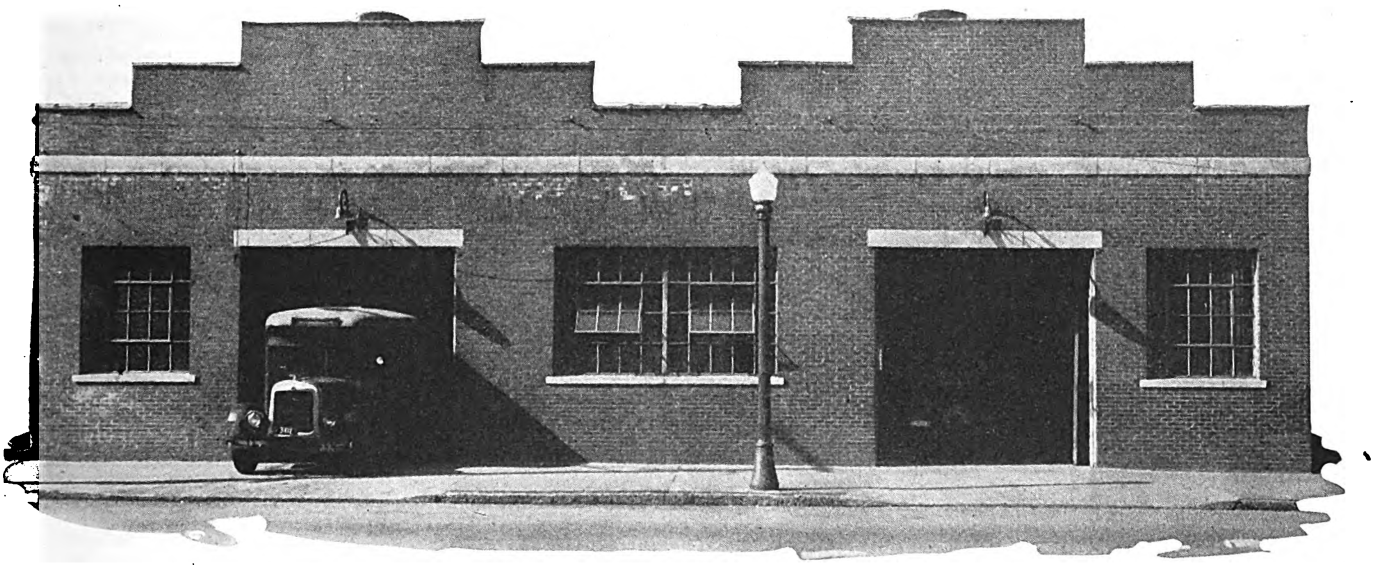
Pneumatic apparatus must be given careful attention,
Regular and systematic care is essential.
Oil and grease will prevent abnormal wear.
Periodic cleaning will assure continuity of service;
Even the door engines should not be neglected.
Require all inspections to be of the highest type.

Men should be instructed in proper care of parts.
All valves must be carefully tested during inspection.
Instead of criticising the design, do the work well;
No apparatus will function right if maintained wrong.
The secret of good operation is good care—
Every nut, bolt and moving part should be examined,
Nothing should be taken for granted.
Analyze failures carefully to prevent a repetition,
Note the cause of each one and correct the cause.
Careless work should not be tolerated,
Even the motormen can help by proper operation.

With every man helping maintenance will be improved.
Insist on regularity of inspections, as
Long overdue inspections invite road delays, so
Let delays decrease and public friendship will increase.

Personal supervision will prove beneficial.
Running apparatus until it fails is poor practice, for
Old or defective parts should be replaced.
Vision of 100% perfect operation can be attained, and
Every management wants successful performance.

Each man will do his share if instructed properly;
Co-operation must exist. To do this
Only capable men should be used on the work and
No inferior material should be used for repairs.
Old methods of drainage are not always suitable.
Much depends on the piping arrangement;
Inspect all piping and apparatus for slow leaks.
Carefully operate all parts before return to service
And if these details are taken care of properly
Long and successful operation will be assured.



Just to the north of the main carhouse and repair shop in Chattanooga is a 70x200-ft. garage recently built by the Tennessee Electric Power Company

Bus and Vehicle Maintenance

Centralized in New Building

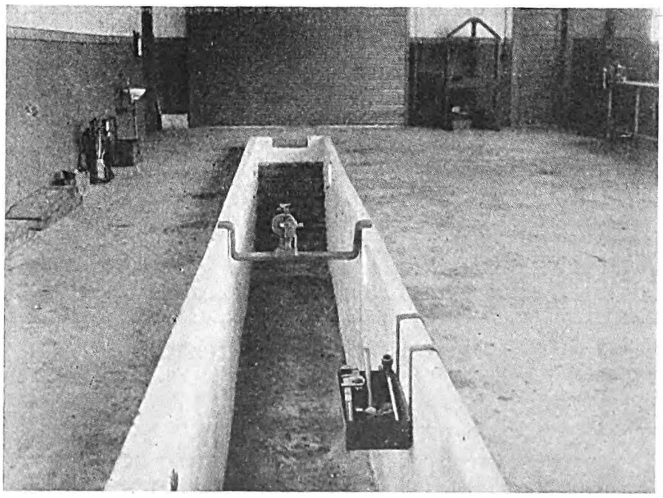
Railway and Power Motor Vehicles of Tennessee Utility Housed in 70x200-Ft. Steel-Tile Structure—Mechanical Costs Kept for Individual Vehicles—Facilities Include Railway Type Pit with Lights Mounted in Side Recesses

By E. D. Reed

Manager Chattanooga District, Tennessee Electric Power Company, Chattanooga, Tenn.

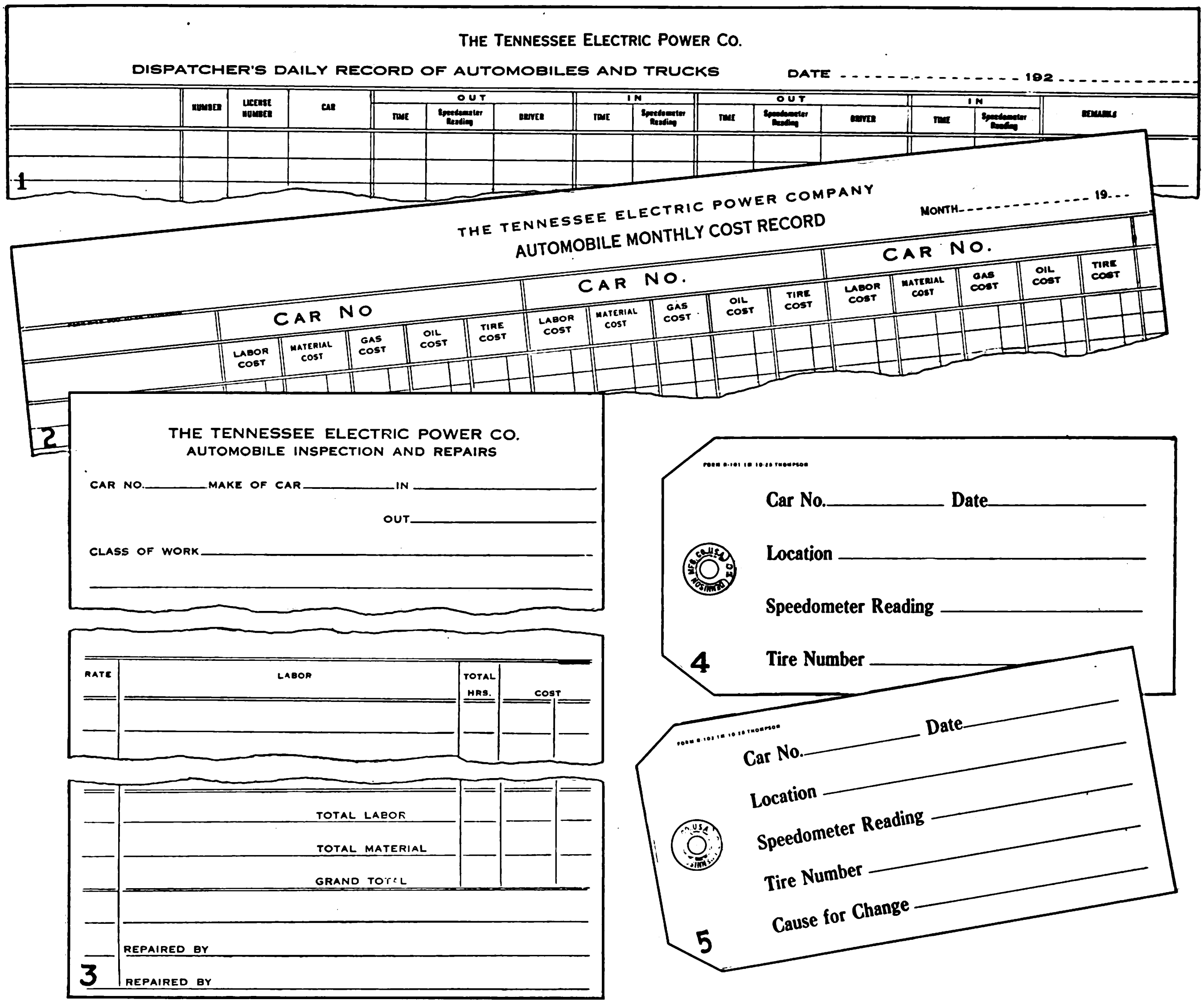
WITH the opening of a new garage early this year and the working out of a system for keeping costs on individual vehicles, the Tennessee Electric Power Company is now well equipped to handle under the one roof all of its 57 motor vehicles. These include five Model Z Yellow buses, 29-passenger capacity, operated from the downtown section to outlying parts of the city of Chattanooga, and 52 trucks and automobiles. The latter include various makes and types—Packards, Buicks, Dodges, Chevrolets and Fords. The trucks are White and Federal. In this list are vehicles used by both railway and power departments, line and emergency cars, as well as official automobiles.

A site for the garage was available immediately to the north of the present trolley carhouses. As shown in the accompanying plan, the garage runs through from Market to Broad Street with two doors on each. This location simplifies the supervision, since J. R. Anderson, superintendent of railways, has jurisdiction over the garage, which is directly in charge of O. E. Nix as foreman. Under him are four day mechanics and two night mechanics with a washer on duty day and night to do oiling and greasing as well. Another employee is a boy whose sole duty is to keep the garage clean. This job we consider rather important. He is supposed to wash down the bottom of the repair pit every day and to clean up immediately any oil or grease that may get on the floor.



A repair shop feature is a 40-ft. pit with openings along the side for electric lights. The rolling steel door leads into the main storage space

The new building, which



THE TENNESSEE ELECTRIC POWER CO.

DISPATCHER'S DAILY RECORD OF AUTOMOBILES AND TRUCKS DATE ....192........

			OUT			IN		OUT			IN		
NUMBER	LICENSE NUMBER	CAR	TIME	Speedometer Reading	DRIVER	TIME	Speedometer Reading	TIME	Speedometer Reading	DRIVER	TIME	Speedometer Reading	REMARKS

1

THE TENNESSEE ELECTRIC POWER COMPANY

AUTOMOBILE MONTHLY COST RECORD

MONTH..................19...

CAR NO					CAR NO.					CAR NO.				
LABOR COST	MATERIAL COST	GAS COST	OIL COST	TIRE COST	LABOR COST	MATERIAL COST	GAS COST	OIL COST	TIRE COST	LABOR COST	MATERIAL COST	GAS COST	OIL COST	TIRE COST

2

THE TENNESSEE ELECTRIC POWER CO.

AUTOMOBILE INSPECTION AND REPAIRS

CAR NO.________MAKE OF CAR________IN ________

OUT________

CLASS OF WORK________

RATE	LABOR	TOTAL HRS.	COST

TOTAL LABOR

TOTAL MATERIAL

GRAND TOTAL

REPAIRED BY

REPAIRED BY

3

FORM R-161 1M 10-25 THOMPSON

Car No.________ Date________

Location ________

Speedometer Reading ________

Tire Number ________

4

Car No.________ Date________

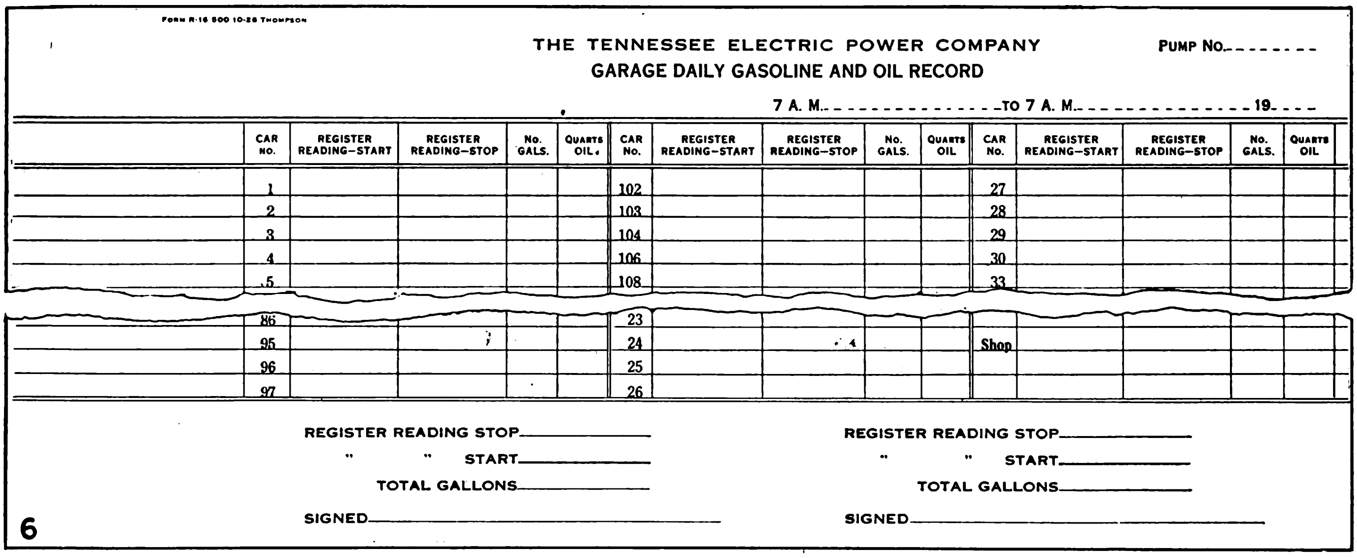
Location ________

Speedometer Reading ________

Tire Number ________

Cause for Change ________

5



FORM R-16 500 10-26 THOMPSON

THE TENNESSEE ELECTRIC POWER COMPANY

GARAGE DAILY GASOLINE AND OIL RECORD

PUMP NO........

7 A. M.................TO 7 A. M.................19....

CAR NO.	REGISTER READING–START	REGISTER READING–STOP	No. GALS.	QUARTS OIL.	CAR NO.	REGISTER READING–START	REGISTER READING–STOP	No. GALS.	QUARTS OIL	CAR NO.	REGISTER READING–START	REGISTER READING–STOP	No. GALS.	QUARTS OIL
1					102					27				
2					103					28				
3					104					29				
4					106					30				
5					108					33				
86					23									
95					24					Shop				
96					25									
97					26									

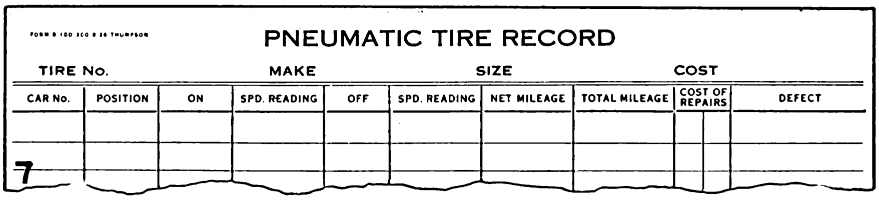
REGISTER READING STOP________ REGISTER READING STOP________

" " START________ " " START________

TOTAL GALLONS________ TOTAL GALLONS________

SIGNED________ SIGNED________

6



PNEUMATIC TIRE RECORD

TIRE No. MAKE SIZE COST

CAR No.	POSITION	ON	SPD. READING	OFF	SPD. READING	NET MILEAGE	TOTAL MILEAGE	COST OF REPAIRS	DEFECT

7

No. 1. "In and Out" form for all vehicles; 19 in. across and 11⅝ in. high, printed on white bond paper with blue rules.

No. 2. Monthly costs are tabulated under five headings. The form, which is 13⅞ in. x 11¾ in., is printed the same on front and back.

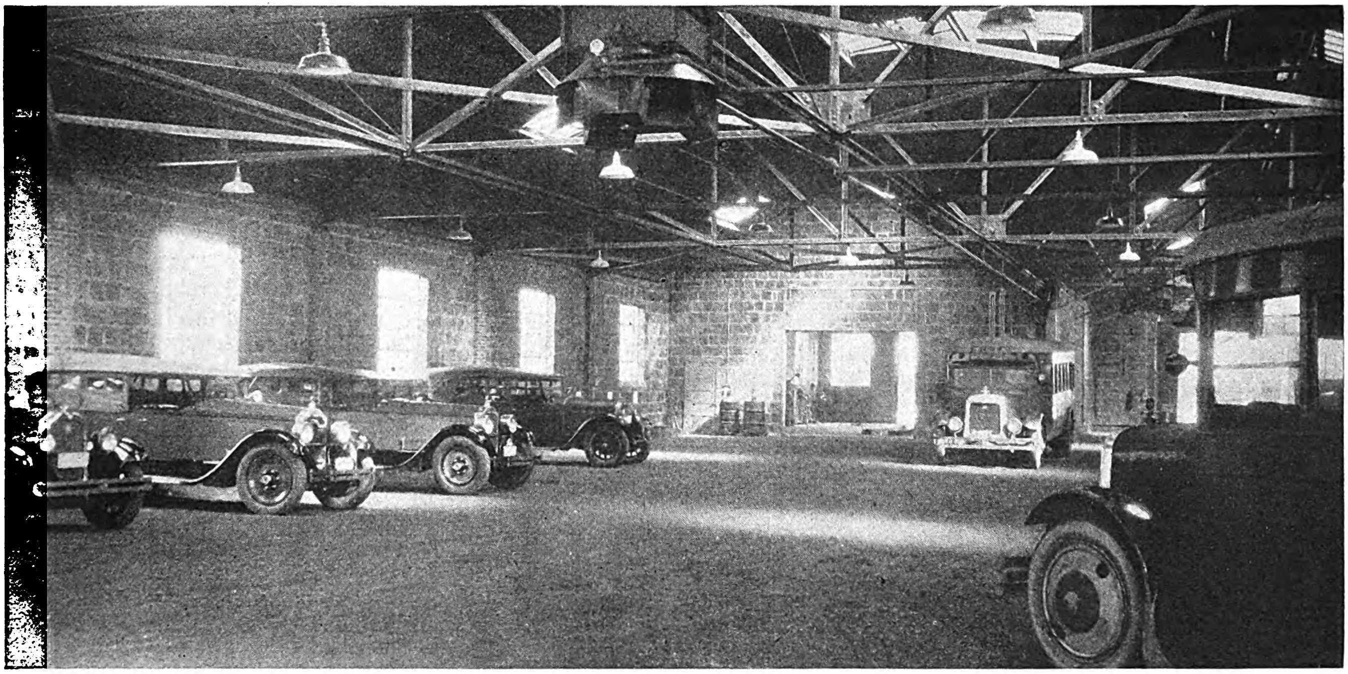
No. 3. On each vehicle being inspected or repaired is this 5½ x 8½-in. white card showing labor and material, the latter listed on the back of the form under Quantity, Kind of Material and Cost.

No. 4. This is a yellow tag, 2⅝ x 5¼ in., marked "Tire On" the back.

No. 5. Is a red tag of same size with "Tire Off" printed on the back.

No. 6. Car numbers are repeated so that two entries can be made daily. The form is on 12⅝ x 14½ in. white stock with blue rules.

No. 7. The tire record contains the life history of each tire as well as its location. This is a 5 x 8-in. card.



Yellow buses and Packard touring cars are some of the equipment that is stored and maintained at Chattanooga. At the rear are tools used in the repair shop

has a steel frame with brick and hollow tile walls, represents an investment of about $45,000, while the garage equipment installed required an investment of at least $1,000 more. Roof and ventilators are of the Roebling steel type and a Wing blower heating system is installed. The roof is mounted on steel trusses with 15-ft. headroom and set on 20-ft. centers.

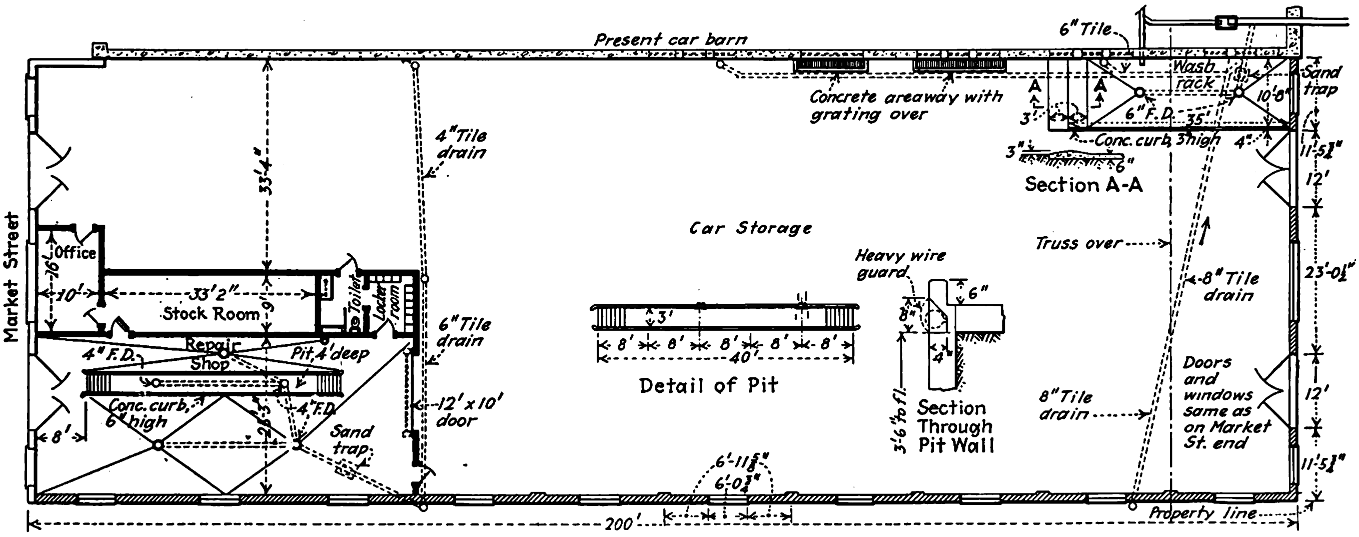
At the Market Street end there are grouped in one corner an office, stock room, locker room and repair shop as indicated in the plan. These are separated from the storage portion of the garage by 8-in. hollow tile walls carried to the roof. Thus of the total 14,000 sq.ft. of area, a little more than 80 per cent is used for storage, about 11 per cent for the repair shop, and 8 per cent for the other rooms. There is a wash rack in the southwest corner which is separated from the garage by a concrete curb 3 in. high and 4 in. wide along the side. It has a raised portion at the end over which vehicles can be driven.

A useful part of the repair shop is a pit 40 ft. long, built along railway lines. It is 4 ft. deep, and along each edge for its full length is a concrete curb 6 in. high and 4 in. wide. Four 50-cp. Mazda lamps are placed in pockets, two on each side of the pit, as illustrated in the plan and one of the views. Over each bulb is placed a heavy wire guard.

Two useful home-made devices are shown in the picture of the pit. The one spanning the pit is to support the jacks used for lifting the rear end of a bus. It is made of 1-in. x 6-in. steel bar. Its shape is such that it gives the men plenty of room to work. The other device consists of two pieces of strap bent to hook over the edge of the pit so as to support a tool chest or a box for spare parts.

Gasoline is bought from the Standard Oil Company. It is stored in two tanks, each of 560 gal., from which it is pumped direct to the buses or automobiles. Galena oil is used for the company's Yellow buses. It is kept in drums fitted with single-stroke pumps. These vehicles also use Dixon No. 677 differential grease and No. 672 gear grease.

Smaller parts kept in the storeroom are held in a


Present car barn
Market Street
Office
16'
10'
33'2"
Stock Room
9'
33'4"
Toilet
Locker room
Repair Shop
4" F.D.
Pit, 4' deep
Conc. curb, 6" high
4" F.D.
26'5"
8'
Sand trap
4" Tile drain
6" Tile drain
12' x 10' door
Car Storage
3'
8'
8'
8'
8'
8'
40'
Detail of Pit
Heavy wire guard
6"
8"
4"
3'-6" to fl.
Section Through Pit Wall
6'-11⅝"
6'-0¾"
200'
Concrete areaway with grating over
6" Tile
A
A
3'
Wash rack
6" F.D.
35'
10'8"
Sand trap
Conc. curb 3" high
4"
3"
6"
Section A-A
Truss over
8" Tile drain
8" Tile drain
Doors and windows same as on Market St. end
11'5¾"
12'
23'-0½"
12'
11'5¾"
Property line

Two 12-ft. doors are placed at each end of the Chattanooga building, leading to two of the main streets

Berloy Berger all-steel cabinet. Parts most frequently needed for the various vehicles are stored here, although no effort is made to keep many of the heavier parts. Three all-steel work benches 6 ft. long and 30 in. wide have been placed in the repair shop. They are fitted with vises made by the Reed Manufacturing Company.

Several devices have been installed for the more efficient handling of equipment. These include three Chisholm Moore chain hoists, three Weaver garage jacks, three Reese portable jacks and one Weaver High-Lift jack of 4-ton capacity. For routine repairs there are a Black & Decker valve refacer, electric drills, a Russell relining machine, Alemite pressure grease gun, and a 40-ton Weaver gear press. The Monarch 9-in. engine lathe, the Hisey-Wolf double-wheel electric grinder, an acetylene welding outfit and a Marshall constant-potential battery charging outfit have also been found useful.

Two methods are used for keeping track of the company's miscellaneous collection of buses, trucks and automobiles. First, a daily record is kept of the time a vehicle is taken out of the garage, the time it is returned, the miles covered in the period and the driver's name. The form used is reproduced with this article.

Second, a cost record is kept for each vehicle. Totals are entered on a sheet which is used for making the monthly report to the executive officers. There are five divisions of costs, built up as follows: All labor and material are recorded on the card "Automobile Inspection and Repairs," a copy of which is attached to any vehicle which is in the garage for repair work or inspection. The next items, fuel and oil, are taken monthly from the sheet headed "Garage Daily Gasoline and Oil Records," which is filled out each day as any vehicle is supplied.

The system used for the tire costs also permits keeping track of the location of any given tire. When a new tire or one repaired is placed on a vehicle a yellow card, "Tire On," is filled out with the number of the car, the speedometer reading and the tire number. This number is also entered on another card, "Pneumatic Tire Records," kept for each individual tire in use. When the tire is removed a red card, "Tire Off," is filled out with location, speedometer reading and the cause for the change. The information from the red card in turn is transferred to the proper tire record card. Any expense in repairing a tire is noted on this red card and is totaled at the end of the month from the cost record to give the item "Tire Costs."

This garage is considered large enough to take care of our requirements for some time to come. More equipment may be added as additional experience is gained, but the results so far indicate that our engineers have made a wise selection not only in the building construction and facilities but also in the garage equipment.

Combination Salt, Sand and Side Wing Car

By ROBERT HARRIS
Master Mechanic New Brunswick Power Company, St. John, N. B.

KEEPING snow at a reasonable distance from car tracks so that additional roadway space would be available for vehicles following a snowstorm is a necessity in the northern country. To meet the requirement for additional equipment for the purpose the New Brunswick Power Company, St. John, N. B., built a combination car in its shops. The dimensions of the car are given in an accompanying table.

The underframe construction of the car is of steel and wood. The outside sills are ⅜-in. x 4-in. x 4-in., 8.5-lb. angles, laid with the flanges on the outside and the bottom. A 5-in. x 6-in. wood filler is attached to receive the outside sheathing and double floor. The intermediate sills are 1¾-in. x 5-in., 6.5-lb. channels, placed 3 ft. 5 in. on centers and an equal distance from the outside. Provision is made for trapdoors for the inspection and repair of motors. The use of a shallow channel permits a low center of gravity. The channels are notched into the cross sills, which are spaced to suit motor conditions, and the whole framework is tied together with tie rods spaced 3 ft. 4 in. apart. Angles and crown heads are used under vestibules. The side sills, intermediate sills, drawbar sills are all fastened securely to a 6-in. channel bumper 15.5 lb. to the foot.

The sides of the car are built up of 2½-in. x 3-in. ash posts with double cross bracing. Sheathing is used inside and out with ¾-in. tongued and grooved material. This runs perpendicular outside and longitudinal inside. The roof is of the arch type. Windows are provided in the cabs for double-end operation and a window on each side is used when winging back snow.

Metal boxes installed directly over each wheel are fastened securely to the side of the car. These contain approximately 18 cu.ft. of sand to be used for sanding the rails. The sand also acts as ballast for the car while winging back heavy snowfalls. The flow of sand to the rail is controlled by means of hand levers which operate the two forward boxes in the direction that the car is going. The sand flows through slide valves and down metal lined hose to the rail, the amount being regulated by the distance that the lever travels.

In addition to carrying sand, the car is also loaded with from 40 to 50 bags of salt, each bag weighing 160 lb. Individual bags are placed on a table on each side of the car from which the salt is emptied into hoppers. The salt is distributed to the tracks after passing through rollers and a metal pipe.

DIMENSIONS OF COMBINATION SAND, SALT AND SIDE WING CAR OF NEW BRUNSWICK POWER COMPANY

Length over bumpers	25 ft.
Width over drip-boards	6 ft. 8 in.
Height rail to top of trolley board	11 ft. 2 in.
Height (inside) floor to roof boards	7 ft.
Type of truck	Single, 21-E-Brill, reinforced, 7-ft. wheelbase
Wheels	Rolled steel, 33 in. diameter, 5-in. axle, solid gear
Motors	Westinghouse 101-B-2, 15:69 gear ratio

A solid steel side wing is installed on each side of the car. This is constructed of ⅞-in. x 24-in. x 14-ft. material and weighs 1,000 lb. The wings are arranged so that they swing out from the body of the car and they may be set to any desired distance from the rail up to approximately 14 ft. The wings are also provided with interchangeable blades on the bottom that can be raised and lowered to clear certain obstructions.

The total weight of the car is approximately 20 tons. In addition to being used during winter weather, it is proving a valuable piece of equipment for all-year service. To add to its utility it is planned to attach an ice breaker.

Electric Railway Journal Maintenance Data Sheet

This Section Represents a

New Service to Maintenance Readers

of "Electric Railway Journal"

MANY electric railway men have suggested the advisability of publishing the maintenance note material which has appeared in the JOURNAL for many years in a form which would make it more convenient for handy reference. Complying with this desire, a maintenance data sheet section will become a regular feature of future issues of the JOURNAL and will appear in the third issue of each month.

For convenience in indexing the data for reference, each item will bear a departmental heading such as "Rolling Stock," "Line Department," "Track and Way Department," "Buses and Trucks," "Standards," "General Data," "Power and Electrical Department," etc.

If desired, these general headings may be further classified into specific operations or departments. Thus, items headed "Rolling Stock" may be divided into "Machine Shop," "Truck Repairs," "Motor Repairs," "Electrical Repairs," "Sheet Metal Work," "Tool Room," "Carpenter Shop," "Car Body," "Blacksmith Shop" and "Paint Shop." Other general headings may be subdivided similarly.

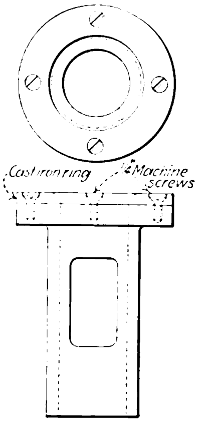
Suggestions are requested from JOURNAL readers as to the character of material that will make this section of greatest value. Maintenance men are urged to take part in the interchange of new ideas. The other fellow wants to know about improved methods of doing a routine maintenance job or a new kink or fixture that saves muscle and labor. By helping him you help yourself. A photograph or sketch with a brief description of the operation or fixture is all that is required. ELECTRIC RAILWAY JOURNAL will pay $5 for each idea published.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL

Bearing Flanges Reclaimed with Cast-Iron Rings

WORN armature bearing flanges are being reclaimed in the shop of the Washington, Baltimore & Annapolis Electric Railroad at Academy Junction, Md., by the installation of cast-iron rings on the worn surface. Master Mechanic J. A. Mellor believes that at least doubled life of bearings is obtained. The worn flange and the two surfaces of the cast-iron ring are machined and the ring is fastened to the flange by means of four ¼-in. flat-head machine screws countersunk at least 1/16 in. below the outer surface of the ring. When installing these reclaimed bearings a fiber ring is placed between the cast-iron surface and the bearing surface of the oil deflecting ring to keep the metallic wear of these parts at a minimum.



Method of attaching cast-iron ring to worn armature bearing flange used by the W., B. & A.

This practice has been adopted for all types of motors where it is applicable. The rings are being installed when required on all motors as they come through the shop for overhauling.

No trouble has been experienced with these cast-iron rings and it is believed they have effected a large saving in bearing maintenance.

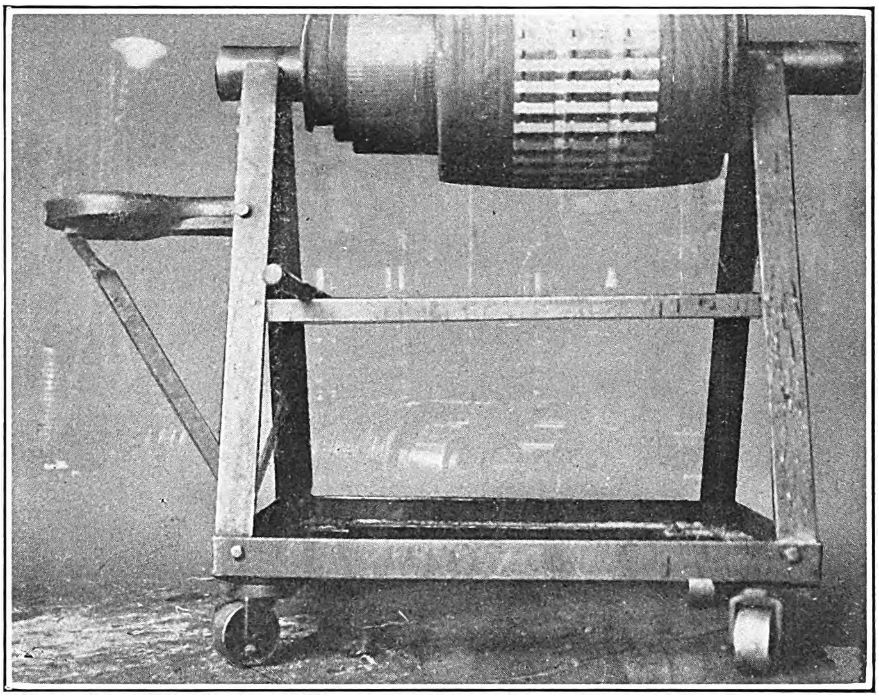
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL

Portable Armature Winding Truck

PORTABLE armature winding trucks are in use in the armature room of the Wilkes-Barre Railway, Wilkes-Barre, Pa. Each is equipped with a metal shelf and a drop seat. The truck framing is constructed of angles, rigidly bolted together.

The shelf is of sheet steel and is installed between the pedestals the full width of the truck frame. It is very convenient for the reception of the worker's tools and repair material. The wood drop seat is hinged to the pedestal and is found useful when the winder is working upon commutators and connections for commutators. It is claimed that the use of this truck has increased production due to the fact that tools and material are close at hand.



Portable armature winding truck with workman's seat and material shelf

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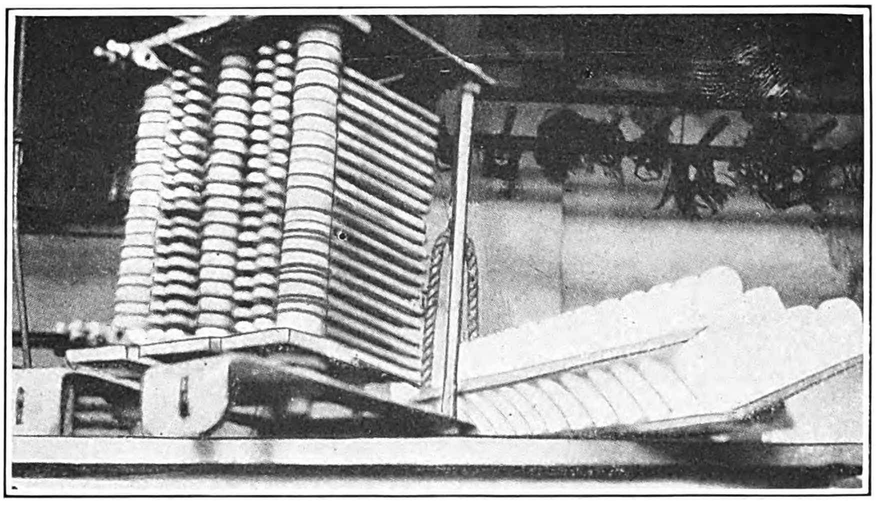
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL

Fiber Washers Increase Creepage Distance on Resistors

INCREASING the creepage surface on rheostats has been accomplished by the New York Railways through the installation of a 3-in. x 3-in. piece of red fiber on each grid-supporting rod between the last grid and the frame. This has eliminated creepage to the frame due to mud collection.

Breakage of controller air deflector backs has also been eliminated by the substitution of red fiber. This fiber has proved satisfactory under normal operating conditions and is obtained readily.



Red fiber washers increase creepage distance on car resistors

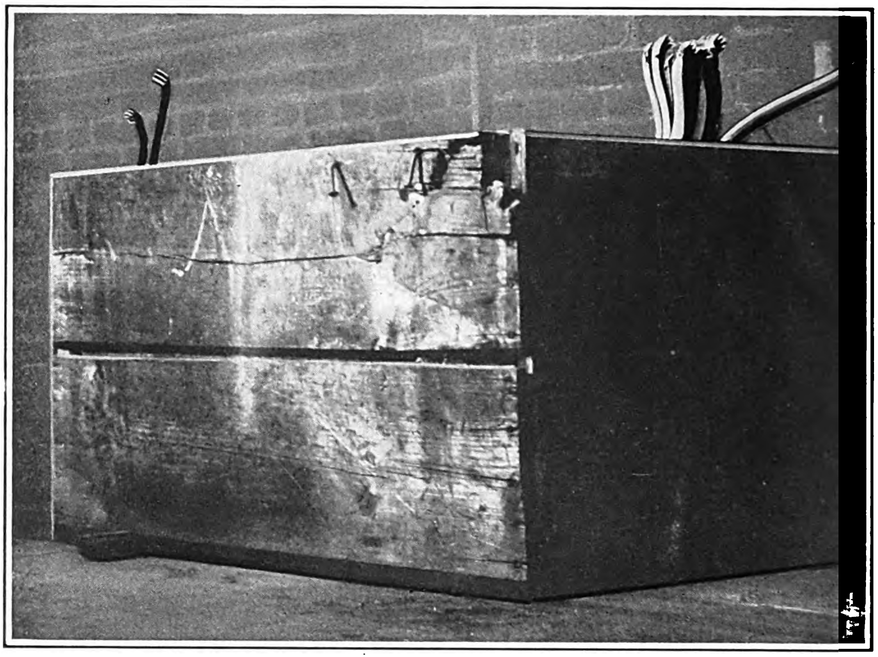
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL

Armature Coil Insulation Removed by Lye

ARMATURE coils having become inoperative due to deteriorated insulation are being reclaimed in the shop of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa. These coils are immersed in a boiling solution of Red Seal lye and at the expiration of 72 hours the insulation can be readily scraped off. The vat is made of 1½-in. planking and lined with galvanized iron. The solution is heated by means of live steam.

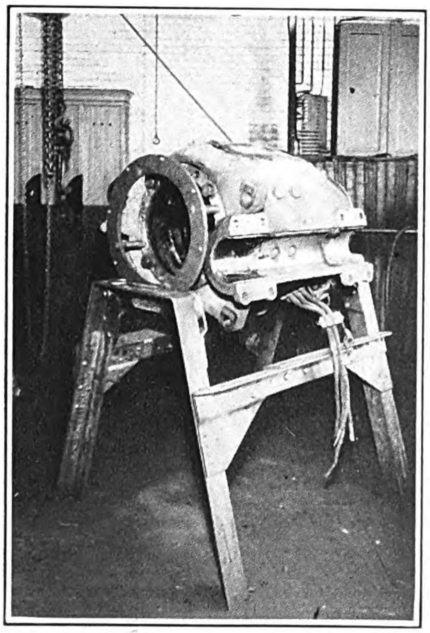
After removal from the lye vat by means of hand hooks they are immediately washed with clean cold water to prevent injury to the workmen. After washing each turn of the coil is thoroughly cleaned, taped and the coil reassembled. It is claimed this process has effected a very material reduction in armature maintenance costs.



Armature coil lye vat

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL



Motor repair stand

Circular steel pieces bolted to the ends of the motor case, and small rollers on the supporting framework, allow the case to be turned to the most convenient position for work.

Rotating Frame Facilitates Motor Repairs

WORK on parts of motor cases that are ordinarily hard to get at has been made much easier by means of a rotating frame used in the Grand Avenue shops of the Connecticut Company, New Haven. This apparatus was designed by J. E. Dooley, master mechanic, and built in the shops. The frame consists of two A shapes held in position by two longitudinal members fastened to the ends by gusset plates, as shown in the accompanying illustration. The ends are continuous 3½-in. x 5½-in. angles bent to the desired shape. Longitudinal members are angles of the same size, but are not continuous. They are arranged to overlap and are bolted together. A series of bolt holes permits the length of the stand to be adjusted according to the size of the motor upon which work is being done.

At each of the upper corners of the end frames is a 4-in. cast-iron wheel. Two circular steel pieces are provided, one bolted fast to each end of the motor case. These circular pieces rest on the small wheels and allow the motor case to be rotated as may be desired.

This arrangement has proved to be a great convenience when field coils are being installed. Instead of being obliged to hold the coil against the top of the motor case, while he is fastening it in place, the shopman now simply turns the case through a half revolution and lays the coil in position on the bottom.

Electric Railway Journal Maintenance Data Sheet

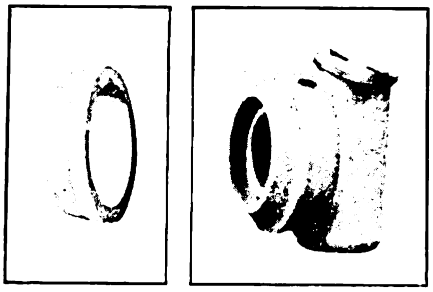
ROLLING STOCK—ELECTRICAL

Motor Heads Reclaimed with Steel Rings

STUDY of several methods for reclaiming Westinghouse 101-B motor heads, as compared with the cost of new ones, convinced J. W. Strawbridge, master mechanic of the Williamsport Passenger Railway, Williamsport, Pa., that reclaiming would be the cheapest proposition.

The method adopted was to shrink a cast-steel ring on the worn head. The steel castings are obtained from the foundry of the Lehigh Valley Transit Company, Allentown, Pa., in the rough. They are of such a bore and outside diameter as will suit every condition of worn head, worn housing or a combination of both. The worn head is turned down to a predetermined diameter and the cast-steel ring is bored to such a diameter as to allow for a tight shrinkage fit over the turned-down head. The casting has a flange and is installed on the head with the flange away from the oil well. After being shrunk on it is turned to the desired diameter. Where the field frame as well as the head is worn the frame is bored out to a standard oversize diameter and the head casting ring turned to the proper diameter to obtain a good fit.

This method has resulted in quite a saving being effected in the repair work, and to date not a single ring has come loose in service.


At left, cast-steel ring ready for shrinking on to turned down motor head. At right, motor head ready for service with cast-steel ring shrunk on the machine

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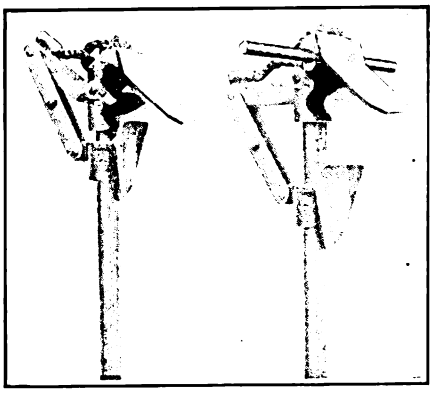
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT

Power Take-off Insures Positive Contact

POWER take-off from the overhead trolley for the operation of portable tools requiring 600-volt energy is made on the Key System Transit Company, Oakland, Cal., by a pole and clamping device, the latter eliminating the possibility of arcing at the wire. The trolley stick, as it is known, is made up in four sections. Three of these are approximately 6 ft. long, while the top one is approximately 18 in. long.

The support for the head in the top section is 1 in. brass tubing, $\frac{1}{16}$ in. thick. Inside of this slides easily another piece of brass tubing. A casting having a boss on one side and a triangular shield of $\frac{1}{8}$-in. copper on the other side is attached to the top of the outer tube. The boss serves as an anchorage for the lever which operates the extreme outer end of the clamping device. The shield, which has a width of 3 in., serves as a guide to the trolley wire when the device is placed in position.


At left, head of power take-off open to receive trolley wire. At right, position when the pole is hooked over the trolley wire

A brass casting on the top of the inner tubing has a groove on the underside and a clamp which presses upward when the head is raised so as to hold the trolley wire in the groove.

The jaws are approximately 3 in. long. A shield of $\frac{1}{8}$-in copper is fastened to the head casting, which, along with the shield on the lower head, guides the trolley wire into the groove. A pair of levers hold the two heads together and actuate the clamp.

When not in use the head drops by its own weight, opening the jaws of the clamp. When the head is hooked over the trolley wire the wire seats itself in the groove and the weight of the pole lifts the head and causes the clamp to close up on the wire. Raising the pole, the weight of the head causes it to drop in the tube, opening the clamping device.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL

Emergency Magnet Winding Machine

WHERE coils are wound at infrequent intervals, or where a number of small magnet coils have to be wound in a hurry, it may be necessary to provide some sort of shop-made equipment to take care of the work. The accompanying illustrations show how a coil-taping machine was arranged to wind small magnet coils in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. In the sketch the tension pegs, numbered 1, 2 and 3, and the tape holder, 4, of the original coil-taping machine were removed from the rotating member, *P*. Three equidistant poles marked *S, S, S* were drilled and tapped in the rotating part of the machine, as indicated. A disk, *K*, was then made of ⅛-in. sheet steel and holes were drilled in this to correspond with the holes *S, S, S*. A ¾-in.-hole was also drilled in the center and the disk was then screwed to the rotating member, *P*, of the taping machine. Studded arbors, of sizes necessary to fit the spools of the magnet to be wound, were provided, and these were bolted to the disk through the center hole. A steady rest was provided for the outside end of these arbors. This steady rest, which was screwed to the bench, was provided with a hinge so that it could be rotated down out of the way while a spool was being inserted over the arbor and to provide for removal of the coil after it was wound. The machine was driven in the usual way by means of a belt. The necessary changes for installation of the disk in no way interfered with the usefulness of the machine for its original purpose.

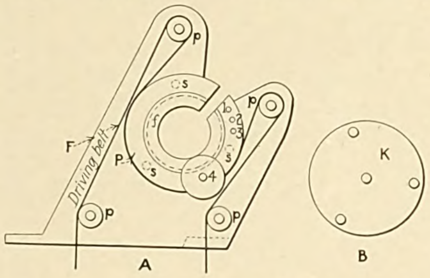
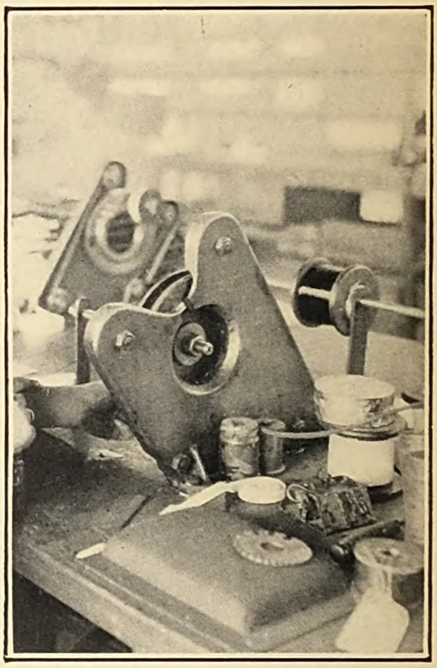


Diagram to illustrate changes in coil-taping machine to adapt it for winding small magnet coils



Winding a coil with the converted machine

Electric Railway Journal Maintenance Data Sheet

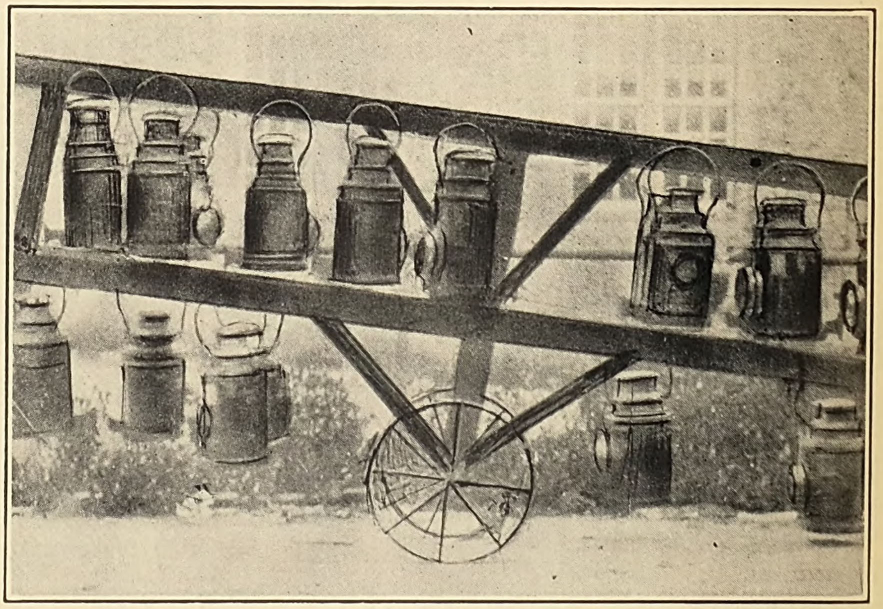
TRACK AND WAY DEPARTMENT

Truck for Transporting Oil Lamps

LABOR of collecting and distributing way department oil lamps has been reduced materially by E. L. Greene, master mechanic York Railways, York, Pa., since the adoption of a manually operated truck designed and built in the company's shops.

This truck consists of a box-shaped skeleton frame 12 ft. long, 18 in. wide and 2 ft. high, with an over-all height of 48 in. above the floor. The frame is built of yellow pine timbers, 2 in. by 3 in., braced with ½-in. x 2-in. flat steel, and is mounted on a pair of 18-in. iron wheels.

Suitable hooks are installed on each of the longitudinal beams for the reception of the lamps. These are so spaced that the lamps can be suspended and moved about without damage to one another.



Portable truck with lamps ready for transportation

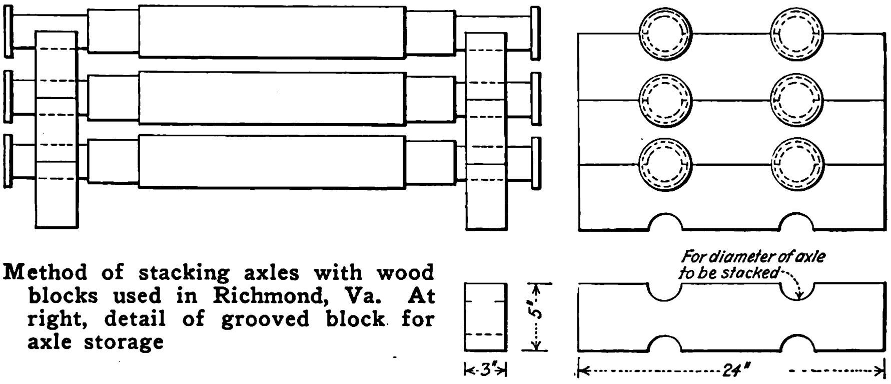
The truck weight being well balanced, one man can move it easily. Previously considerable time and labor were required to transport these lamps by hand.

Using the portable truck, the labor has been reduced to such an extent as to permit of one man performing the entire operation.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS

Grooved Wood Blocks for Axle Storage



Method of stacking axles with wood blocks used in Richmond, Va. At right, detail of grooved block for axle storage

DUE to car axles being scattered about the floor the machine shop of the Virginia Electric & Power Company, Richmond, Va., presented a rather untidy appearance until the master mechanic, W. J. Hicks, devised a method for their neat, compact and systematic stacking. This consists of the utilization of oak blocks grooved to conform to the diameter of the axles to be stacked, and placed between each pair of axles at either end. The blocks are 3 in. high, 5 in. wide and 24 in. long.

To permit of easy handling the axles are stacked under lifting facilities. New axles of one size are put in one pile, old axles of the same size to be turned are placed in another, and bent axles of the same size in a third. With this arrangement axles can be removed from the top of the pile and the ones on the bottom will not have to be disturbed, although they can be inspected readily.

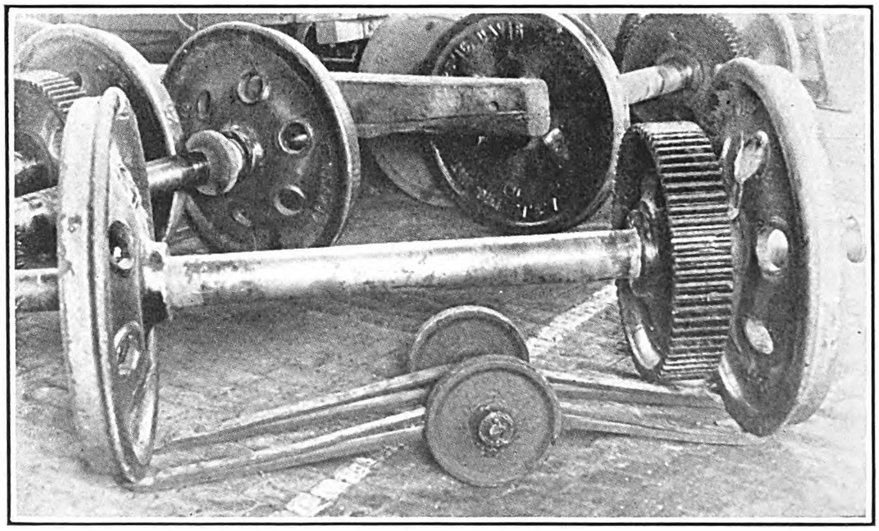
This stacking of axles has improved the shop appearance and has provided a means for decreasing the floor space required for the storage of a given number of axles. When not in use these blocks can be stored away in a neat and systematic manner.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS

Handy Type of Car Wheel Buggy

SHOPS are sometimes so crowded that it is impossible to roll wheels after they are mounted and unless some type of crane or hoist is available the transporting of wheels is rather difficult. To meet this condition a handy type of buggy has been devised in the shops of the Grand Rapids Railway, Grand Rapids, Mich. This consists of two central 8-in. diameter wheels connected by a shaft. Arms extend out on either side of this shaft a distance necessary to support a pair of mounted car wheels. Each supporting arm is made of two pieces of steel strap, one piece passing above and the other below the shaft. These are shaped to provide an ample bearing surface and the extreme ends are turned up so that a pair of wheels can be rolled into position and held without danger of slipping off. A pair of wheels mounted on the buggy can be balanced easily and so pushed endwise to any location desired. When the wheels are in a balancing position there is a small clearance for the ends of the supporting straps above the floor.



Pair of mounted wheels in position on buggy for transporting about shop

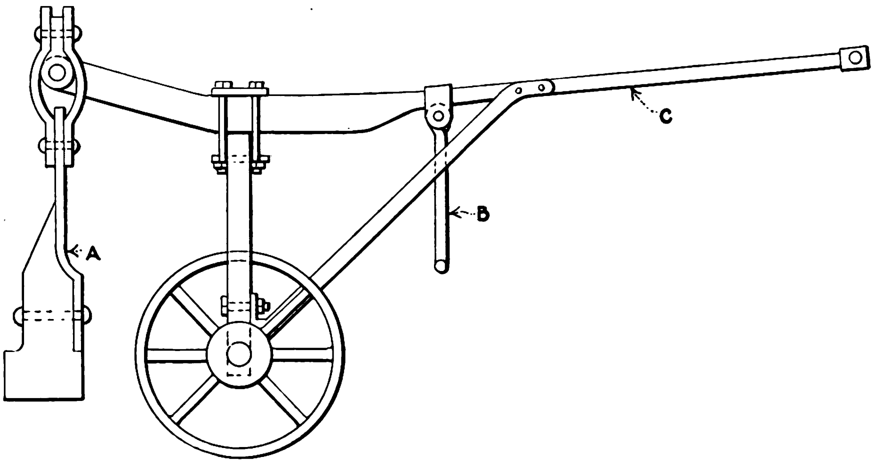
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS

Truck for Handling Car Axles

FOR moving car axles about the shop a handy truck is used by the Interborough Rapid Transit Company of New York.

This truck, which was designed and built in the company's shop, is shown in the accompanying sketch. To lift and move an axle the truck is placed so that the wheels straddle it and the handle, *C*, raised to such a height as will permit the tongs, *A*, to grip the axle slightly beyond the center of gravity. Lowering the handle, *C*, raises one end of the axle from the floor until the hook, *B*, can be slipped under the overbalanced end. By raising handle, *C*, the axle is then lifted clear of the floor so that it can be transported to any desired location.



Truck used by Interborough Rapid Transit Company for handling car axles about the shop

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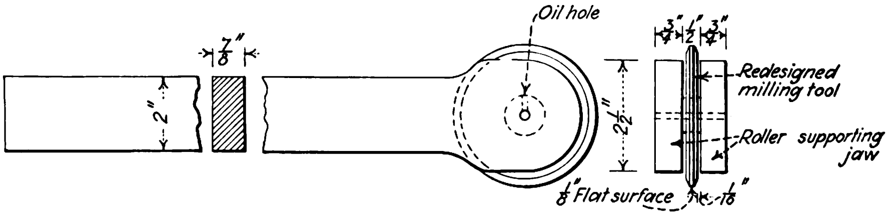
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS

Polishing Bearing Surfaces of Axles

POLISHING bearing surfaces of axles is the purpose of a tool which has been designed and constructed in the shop of the Virginia Electric & Power Company, Norfolk, Va., under the supervision of the master mechanic, T. W. Madison. This tool consists of a redesigned 3-in. milling cutter, together with a suitable supporting arm. Finding that a 3-in. milling cutter with a 1-in. arbor hole had served its usefulness as a milling tool, the remnants of the teeth were turned off and the circumference was given a rounding contour except at the top, which was left flat for about ⅛ in. The 1-in. arbor hole was bushed down to ½ in. to provide for the insertion of a ½-in. steel shaft. This bushing is installed with a 1/16-in. projection beyond the side surfaces of the roller to allow sufficient clearance between the side faces and the inside surfaces of its supporting jaw.



Appearance of assembled roller and arm used for polishing purposes

The supporting jaw and arm are made from a 2-in. x 3-in. steel bar, one end being slotted and drilled for the roller and shaft. The bar is tapered down to 2 in. x ⅞ in. about ½ in. from the slotted end, to fit in the tool rest. A ⅛-in. diagonal hole is drilled through the roller bushing for lubrication.

The axle to be polished is run in a lathe at about the same speed as for a finishing cut. The polishing tool installed in the tool rest with the roller forced against the oiled shaft surface produces a high-luster finish.

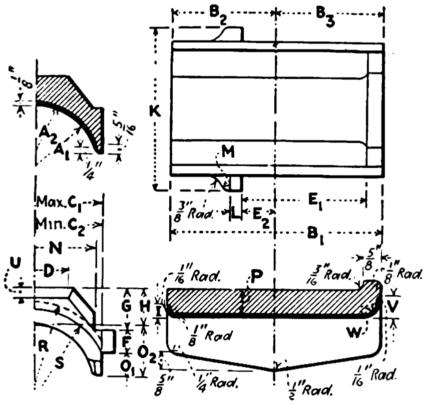
The results obtained with this polishing tool have been so satisfactory that the usual method of polishing by means of fine files or emery paper has been discarded.

Electric Railway Journal Maintenance Data Sheet

STANDARDS

Standard Dimensions of Journal Bearings

THE American Electric Railway Engineering Association has six standard journal bearings which are arranged to fit the six standard axles of the association. These were adopted as revised in 1926. The accompanying drawing and table give these. Originally the standard journal bearings for the six sizes of journals required six drawings. In order to provide uniformity a change on one usually required similar changes on the others, so that six drawings had to be changed each time. As a number of changes appeared desirable to the 1926 equipment committee, it was considered preferable to reduce the number of drawings and provide a table to show the different dimensions. In arranging this it was found that some of the dimensions were not uniform for various sizes. The use of the single drawing and table made these apparent at once, while when used on several drawings they would not be noticed.



Dimension drawing for journal bearings to be used with table

DIMENSIONS OF
STANDARD JOURNAL BEARINGS

Size Journal	A1	A2	B1	B2	B3
3 x 6	1 17/32	1 17/32	5¾	2⅞	2⅞
3¼x 6	1 21/32	1 21/32	5¾	2⅞	2⅞
3¾x 7	1 29/32	1 29/32	6¾	3⅜	3⅜
4¼x 8	2 6/32	2 6/32	7¾	3⅞	3⅞
5 x 9	2 17/32	2 17/32	8¾	4⅜	4⅜
5½x10	2 25/32	2 25/32	9¾	4⅞	4⅞

Size Journal	C1	C2	D	E1	E2
3 x 6	3 27/32	3 13/16	1¾	3½	1¼
3¼x 6	3 27/32	3 13/16	1¾	3½	1¼
3¾x 7	4 17/32	4½	2	4	1¼
4¼x 8	4 29/32	4⅞	2 5/16	4½	1¼
5 x 9	5 21/32	5⅝	3⅛	5 3/16	1 7/16
5½x10	6 5/32	6⅛	3⅛	5 11/16	1 7/16

Size Journal	F	G	H	I	K
3 x 6	¾	1	1	⅜	4 11/16
3¼x 6	⅞	1	1	⅜	4 11/16
3¾x 7	⅞	1⅛	1	9/16	5½
4¼x 8	13/16	1 3/16	1	9/16	5⅞
5 x 9	1 1/16	1 3/16	1⅛	⅝	6⅞
5½x10	1 1/16	1 5/16	1⅛	⅝	7⅜

Size Journal	L	M	N	01	02
3 x 6	½	⅜	3¼	¾	1½
3¼x 6	½	⅜	3¼	⅝	1½
3¾x 7	½	⅜	3¾	½	1½
4¼x 8	½	⅜	4⅛	⅞	1⅞
5 x 9	⅝	⅜	4¾	1⅛	2¼
5½x10	⅝	½	5⅜	1⅛	2⅜

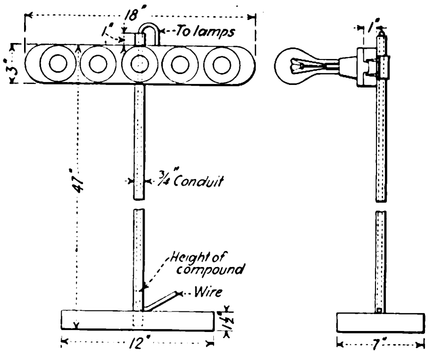
Size Journal	P	R	S	U	V	W
3 x 6	⅞	2	2	¼	¾	½
3¼x 6	⅞	2	2	¼	¾	½
3¾x 7	⅞	2 7/16	2 7/16	¼	13/16	¾
4¼x 8	⅞	2 11/16	2 11/16	⅜	13/16	¾
5 x 9	1	3⅛	3⅛	⅜	1	¾
5½x10	1	3⅜	3⅜	⅜	1	¾

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—PAINT SHOP

Lamp Bank for Use in Paint Shop

EXTERIOR illumination of cars undergoing painting in the paint shop of the Lynchburg Traction & Light Company, Lynchburg, Va., has been improved greatly since several lamp banks were installed in convenient locations adjacent to the cars. These lamp banks were designed by Master Mechanic M. M. Cochran and built in the shop. They consist of a base made of dry oak 1½x7x12 in., in the center of which is installed a piece of ¾-in. conduit 48 in. long. About 1 in. from the end of the conduit is installed a piece of ash 1x3x18 in. long and fastened to the ¾-in. conduit by means of a ¾-in heavy pipe strap. This piece of ash acts as a base for the support of the five incandescent lamps and is grooved in the center to permit of the installation of the wires, which enter the conduit through a ⅝-in. hole drilled directly above the base, make their exit from the end of the conduit and drop down to the groove in the lamp supporting base. Compound poured into the pipe about 3 in. up from the base prevents injury to the insulation of the wires from chafing at their entrance to the conduit. A drilled wood plug inserted in the end of the conduit prevents chafing injury to the wires at the point of their exit from the conduit.

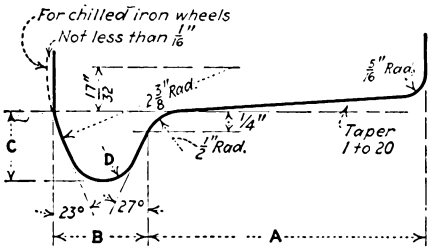


Lamp stands used in the paint shop of the Lynchburg Traction & Light Company, Lynchburg, Va.

Electric Railway Journal Maintenance Data Sheet

STANDARDS

Wheel Tread and Flange Contours

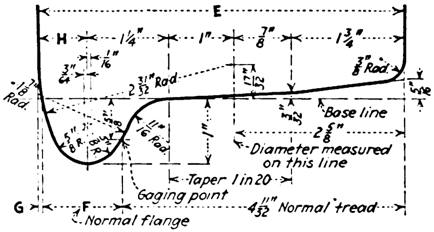


A.E.R.E.A. Standard Tread and Flange Contours for Steel and Chilled Iron Wheels

Standard Tread and Flange Contours	A	B	C	D
A-3	3"	1 3/16"	7/8"	27/64"
A-3½	3½"	1 3/16"	7/8"	27/64"
B-2½	2½"	1 1/8"	3/4"	15/32"
B-3	3"	1 1/8"	3/4"	15/32"
C-2½	2½"	1"	3/4"	3/8"
C-3	3"	1"	3/4"	3/8"
D-2½	2½"	1"	5/8"	29/64"
D-3	3"	1"	5/8"	29/64"

STANDARD tread and flange contours were adopted by the American Electric Railway Engineering Association in 1923. A-3, A-3½, B-2½, B-3, C-2½, C-3, D-2½ and D-3 provide four flange contours each in combination with two widths of treads and are for both steel and chilled iron wheels.

Contour E is for chilled-iron wheels as standardized by the American Railway Association in 1909 and contour F is for steel and steel-tired wheels as standardized by the American Railway Association in 1920. These latter contours were also made A.E.R.E.A. standard in 1923.



A.R.A. Standard Tread and Flange Contours for Steel, Steel Tread and Chilled Iron Wheels

Standard Tread and Flange Contours	E	F	G	H
E	5 5/8"	1 15/64"	3/64"	3/4"
F	5 1/2"	1 5/32"	0	5/8"

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—PAINT SHOP

Car Painting in Berlin

THE all-metal cars on the Berlin Street Railway system are painted with both the brush and the spray methods. Particulars of these cars were published in the ELECTRIC RAILWAY JOURNAL for Jan. 29 and Feb. 5. The schedule of application with the brush and spray methods appears in the accompanying tables:

SCHEDULE OF OUTSIDE ENAMEL APPLICATION WITH BRUSH, BERLIN CARS

1. Rub all rust spots with No. 00 sandpaper.
2. Wash the surface of the plate with a cleaner to remove any grease or remaining rust spots.
3. Put on foundation oil paint, white.
4. Putty (or cement) all cracks and screw holes.
5. Put on coat of oil paint, white and yellow.
6. Rub down with No. 00 sandpaper.
7. Put on coat of oil paint, white and yellow.
8. Rub down with No. 00 sandpaper.
9. Put on a coat of enamel, white and yellow.
10. Rub down with oiled paper and pumice.
11. Put on a coat of enamel, white and yellow.
12. Rub down with oiled paper and pumice.
13. Striping and lettering.
14. Apply outside varnish.

Total time required is five working days and the material used is as follows:

Material required:

Oil paint, white	6 kg. or	13.2 lb.
Lead putty	1.5 kg. or	3.3 lb.
Oil paint, yellow	3.5 kg. or	7.7 lb.
Enamel, white	3.0 kg. or	6.6 lb.
Enamel, yellow	3.0 kg. or	6.6 lb.
Enamel, black	0.5 kg. or	1.1 lb.
Outside varnish	2.0 kg. or	4.4 lb.
Rubbing enamel	1.0 kg. or	2.2 lb.
Pure turpentine	1.0 kg. or	2.2 lb.
Cleaning fluid	2.0 kg. or	4.4 lb.

SCHEDULE OF OUTSIDE ENAMEL APPLICATION WITH SPRAY, BERLIN CARS

A number of cars were painted with the spray method. The first four steps were the same as those just given for the brush method. The later steps were as follows:

5. Rub down with sandpaper.
6. Apply one coat of white oil paint to the upper half by spray.
7. Apply one coat of yellow oil paint to the lower half of spray.
7. Apply one coat of white japan enamel by spray.
9. Apply one coat of yellow enamel by spray.
10. Rub down with oiled paper and pumice.
11. Apply one coat of yellow enamel by spray.
12. Rub down with oiled paper and pumice.
13. Striping and lettering.
14. Apply outside varnish by spray.

Total time required three working days.

The temperature of the room should be 25 deg. C. (or 77 deg. F.) if possible. Artificial drying is not necessary.

The material required is as follows:

Foundation oil color, white;		
(white paint)	0.75 kg. or	1.8 lb.
Pure turpentine	0.75 kg. or	1.8 lb.
Lead putty	1.5 kg. or	3.3 lb.
Oil paint, white	1.8 kg. or	4.0 lb.
Oil paint, yellow	4.0 kg. or	8.8 lb.
Japan enamel, white	1.0 kg. or	2.2 lb.
Enamel, yellow	3.5 kg. or	7.7 lb.
Enamel, black	0.5 kg. or	1.1 lb.
Outside varnish	2.5 kg. or	5.5 lb.
Pure turpentine	0.5 kg. or	1.1 lb.
Cleaning fluid	2.0 kg. or	4.4 lb.

Improved Equipment

for Electric Railway Maintenance

RELIABLE, safe and attractive transportation is a prime requisite of any campaign to attract additional riders. To provide this, much depends upon the equipment available for carrying on the various maintenance operations. More modern machine tools are needed in railway repair shops and improved tools for track and line maintenance work will assist materially in reducing delays and provide for the passengers a smooth, noiseless ride.

Some of the latest improved equipment for railway maintenance is described in the following pages. Careful study of them should produce many suggestions as to equipment needed to bring maintenance to a higher standard and carry on repairs efficiently and economically.

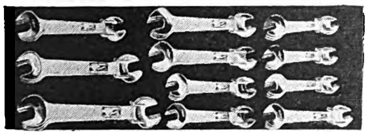
◆

For Repairing Car Body and Overhauling Trucks

Wrench Set No. 311

BONNEY FORGE & TOOL WORKS
Allentown, Pa.

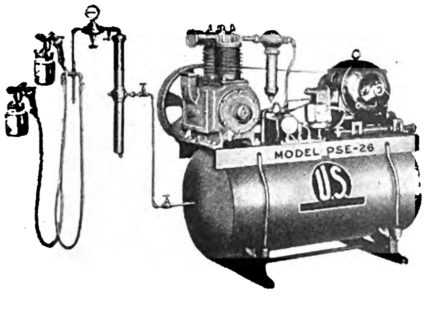
WRENCHES in sets, as shown, are suitable for general repair work. This set, designated as No. 311, consists of three each of the eleven most popular sizes. They are drop forged from vanadium steel, very light and thin but yet strong and well balanced. Thin, pear-shaped jaws permit maximum clearance in close quarters. Each one is guaranteed to strip the thread or break the bolt without damage to the wrench.



Paint Spray Equipment

UNITED STATES AIR COMPRESSOR COMPANY
Cleveland, Ohio

MODEL PSE-26 paint-spraying unit, as shown, is of the twin-cylinder, air-cooled, single-stage type and has sufficient capacity for the continuous operation of two paint guns. It will operate within a tank pressure range of 90 to 125 lb. The reducing valve mounted on the moisture separator permits an air adjustment of from 40 to 90 lb. for painting. The displacement of this unit is 16 cu.ft. of air per minute.

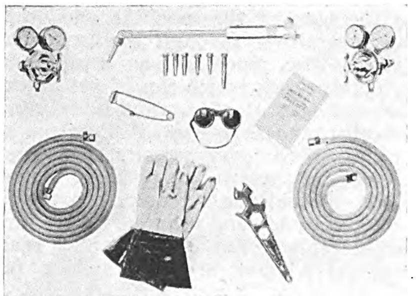


The 60-gal. tank has longitudinal seams, riveted and copper brazed. The compressor is belt-driven by a 3-hp. a.c. or d.c. motor, as desired. The complete unit is 36 in. wide, 52 in. long and 48 in. high. It is shipped with moisture separator, reducing valve, air gage, two paint spray guns with quart cups and two 25-ft. lengths of hose and fittings.

Combination Cutting and Welding Equipment

ALEXANDER MILBURN COMPANY
1416-1428 West Baltimore Street,
Baltimore, Md.

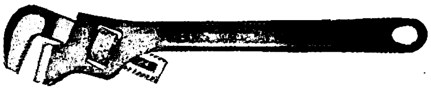
WITH this equipment all operations of welding and cutting can be handled. It is necessary only to change the tips to cut or to weld. The outfit consists of a type N.I. combination torch, 21 in. long; three welding tips, three cutting tips, an oxygen regulator with 3,000-lb. initial pressure gage and 200-lb. delivery pressure gage, acetylene regulator with 500-lb. initial pressure gage and 50-lb. delivery pressure gage, 25 ft. oxygen hose and 25 ft. acetylene hose, both with couplings; a pair of fiber frame goggles, a pair of workman's gloves, friction torch lighter, combination wrench, instruction book and pressure chart. The approximate shipping weight is 45 lb.



Lawson Pipe Wrench

LAWSON MANUFACTURING COMPANY
6505 Carnegie Avenue, Cleveland, Ohio

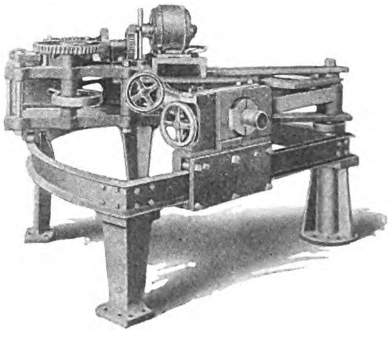
WRENCHES of the type shown are all drop forged from a high grade of steel and have removable jaw housings forged solid with the handle. The jaw teeth are said to be hardened and tempered to give the greatest strength with the least wear. Because it has an angle handle, the Lawson pipe wrench is adaptable to many positions. It has working access to pipes lying close to the floor, wall or ceiling, where it will give ⅛ turn of the pipe. The wrench has exceptional strength in both handle and jaw. Its compact, self-contained and well-balanced design is mechanically correct. The jaws, which are always in an open position ready to grip a pipe, will release instantly when the wrench is to be removed from the pipe. The location of the adjusting nut and the one coil spring used to hold the jaws open permit of one-hand operation. It is made in sizes of 8, 10, 14, 18 and 24 in.



Type E Motor-Operated Pipe-Bending Machine

AMERICAN PIPE BENDING MACHINE COMPANY, INC.
37-39 Pearl Street, Boston, Mass.

BENDING of 1¼-in. to 4-in. cold pipe without having it filled with any substance is the purpose of the machine shown. It is capable of making 1¼-in. to 2-in. pipe bends at the rate of ten to fifteen per hour and 2-in. to 4-in. pipe bends at the rate of five to ten per hour. A 3-hp. motor is fur-

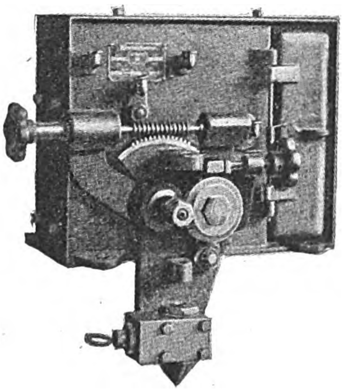


nished with each machine. The complete machine weighs approximately 3,800 lb. and occupies a floor space of 7 ft. 6 in. x 7 ft. 6 in. Suitable bending forms and pipe holders are furnished for the bending of 1¼-in. to 4-in. pipe. Other motor-operated machines in production are the type F standard for bending 3-in. to 6-in. cold pipe and the type F special for bending 3-in. to 5-in. cold pipe. Where hand-operated machines are desirable type F Junior can be furnished for ½-in. bends, type A for ⅜-in. to 1-in. bends, type B special for 1¼-in. to 2-in. bends and the type B Hercules for 3-in. to 4-in. bends. The same construction is incorporated in the hand-operated machines as in the motor-operated machines.

The Auto Arc

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.

WESTINGHOUSE auto arcs or automatic arc welding heads are designed for production or repair work on repetition operations, by which production can be greatly increased due to the greater welding speed obtainable. They are adaptable to welding axle housings, gear cases, metal pans or boxes, building up worn car wheels, flanges or brake equalizers and any work where a bead of metal is to be laid in a regular path. The machine automatically feeds the welding electrode to the work at the required speed for the job and will maintain a constant arc voltage. The auto arc will strike the arc automatically. The unit is entirely self-contained, no other mechanism being required except the actual work handling machinery designed either to move the auto arc along the seam to be welded or to pass the work under the arc. The machine consists of a housing approximately 18 in. long, 7 in. wide and 14 in. high, in which is contained a control and driving mechanism. The rolls, guides and nozzle through which the electrode is fed to the arc extend from the front of the case.

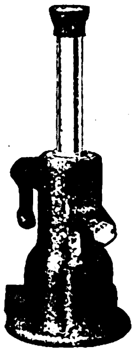


The driving and feed mechanism is regularly supplied for use on 110 volts, 25, 50 or 60 cycles alternating current or 230 volts direct current, as desired. Special machines for other voltages may be obtained. The driving and feed circuit is entirely separate from the arc circuit and is not affected by it. It is claimed that the auto arc will stand up under shop conditions and have practically no maintenance except lubrication and an occasional inspection of the moving parts. Adjustments are possible on the nozzle so that the arc can be directed to the part of the work where the weld is desired.

Petersen "Oiljak"

OIL JACK COMPANY, INC.
15 Park Row, New York City

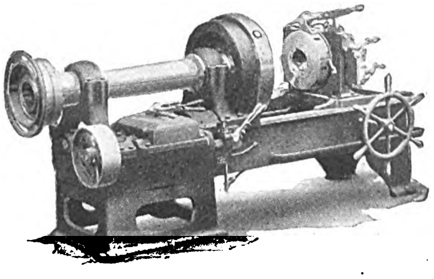
TWO popular models of the "Oiljak," the JB-3 of 3 tons capacity and the JB-10 of 10 tons, are now in full production. Any load within the capacity can be raised with little effort, steadily, smoothly and quickly. Loads can be lowered without jar or shock and can be stopped instantly at any position. An important feature permits of operation of the jacks with short, inch by inch motions of the handle if desired. A full stroke is not necessary, as is the case of most jacks. This makes the jack advantageous for use in cramped quarters. Where danger exists the jack can be operated from a distance by using a longer handle.



No. 4 Peerless Improved Pipe Machine

BIGNALL & KEELER MACHINE WORKS
of the N. O. NELSON MANUFACTURING COMPANY
Edwardsville, Ill.

MODERN machine tool design trends toward elimination of cone pulleys and belts. The pipe threading machine shown is designed along these lines. While using a single driving pulley, a constant belt speed is obtained which can be suited to the heavier work. Eight speeds are obtainable with a constant speed motor by shifting the gears. The motor is bolted to the rear of the machine and power is transmitted through a silent chain drive. The machine has a universal gripping chuck which can be set quickly for any size of pipe, thus adapting it for all-round shop use. A Peerless adjusting mechanism permits adjustment to obtain threads at different gages. A cut-off tool and a reamer provide for the cutting off and reaming of all pipe. Accessibility of all gears and ready removal of dies are outstanding features. A direct-connected oil pump is furnished for lubricating purposes.



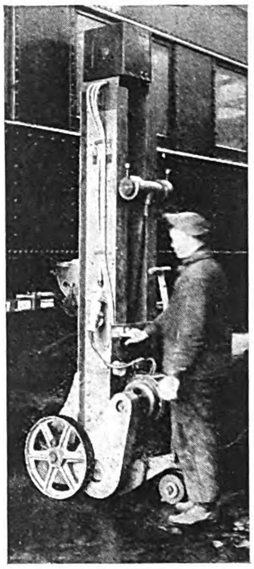
All parts of the machine are accessible for inspection and repairs. It occupies a floor space of 34 in. x 98 in. Each machine is furnished with one set of right-hand dies for threading 1-in., 1¼-in., 1½-in., 2-in., 2½-in., 3-in., 3½-in. and 4-in. pipes.

Portable Car Hoists

WHITING CORPORATION,
Harvey, Ill.

PORTABLE car hoists of this manufacturer embody the same basic principles as the Whiting locomotive and truck hoists now widely used. The car hoist consists of a machined steel screw of ample diameter mounted on a worm gear in a substantial base and housed by a structural frame. The projecting step or support by which the car body is lifted rests on a bronzed nut on the steel screw. The car weight is carried on a hardened and ground alloy steel roller bearing. Power is supplied by an electric motor.

By using two pairs of portable hoists, one pair at each end of the car, the entire car body may be raised off the truck at once. The trucks can then be coupled and handled at one time. All four hoists may be operated as one unit, with the control in one push-button station.

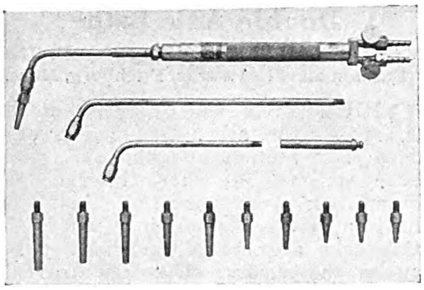


A toggle mechanism lifts the base of the hoist off the ground high enough to put the weight on the wheels, allowing the hoist to be pulled from place to place like a small truck. After being moved into position alongside the car a reverse movement of the toggle lowers the hoist so that its three bearing surfaces rest squarely on the floor. These are spaced to give much greater stability than ordinary jacks. The hoist shown needs no foundation or pit, but may be used on any level floor capable of sustaining the load. No air or water lines are required. Power is used for lowering, so that blocking is not needed under a car, which may be left over the noon hour or night without danger. The hoist will handle cars of any class or size, making unnecessary an assortment of special jacks.

Airco-Davis-Bournonville Style 7700 Welding Torch

AIR REDUCTION SALES COMPANY
342 Madison Avenue, New York, N. Y.

GAS consumption at the rate of one volume of oxygen to one volume of acetylene, which is the ideal for a perfect neutral flame, is said to be practically attained in the style 7700 torch with oxygen of 99.5 per cent purity. The principles of mixing embodied in the design produce a soft, high temperature neutral flame which favors high quality welding with speed and economy. The new torch is approved by the Underwriters Laboratories and is especially well balanced. The possible combination of extension tubes, mixers and tips provides a torch for a full range of welding from sheet metal to heavy forgings or castings.

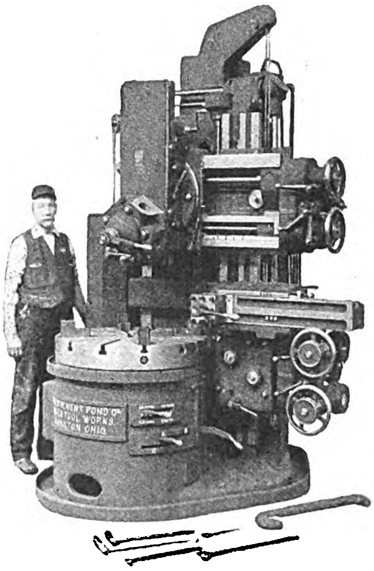


The rear end is a brass forging. The handle is made of seamless knurled brass tubing. The head is of special bronze. Seamless oxygen and acetylene tubes are silver soldered to the head and rear end. Extension tubes 6 in., 9 in., and 16 in. long fit either mixing head. The complete weight of the torch with an 8-10-in. mixer, 9-in. extension tube and with the No. 10 tip is 30 oz.

Side-Head Boring Mill

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond
Company, Hartford, Conn.

WITH the side head of this boring tool in working position the machine will take work up to 38 in. diameter. A feature is that the side head may be lowered below the table, so that work up to 44 in. diameter can be finished all over with the vertical head. The bed and column are cast integral. The left-hand housing has a flat bearing and the right-hand housing has a three-track bearing with a long narrow guide for the cross rail and side head. The table and chuck are made in one unit mounted directly on the spindle. The three-jaw chuck which is regularly furnished can be operated either universally or independently. The spindle has a taper bearing for absorbing the vertical thrust. Power is delivered to the table through beveled gears and a disk type clutch. The speed change unit is of the selective sliding gear type, with twelve speeds controlled by two levers. The cross rail is elevated and lowered by means of power. The turret slide can be swiveled in either direction to an angle of 30 deg., the swivel being graduated on both sides. This adjustment is made by a worm and worm segment which can be operated from either side. Sixteen positive feed changes are provided. Rapid traverse in all directions and a complete equipment of micrometer dials and observation scales are at the operator's command.



The turret rotates around a cylindrical stud and has bearings equal to the full diameter of the turret. The turret has ten indexing positions so that it can be indexed half way between each of the regular positions. With the turret indexed half way, two tool holders are brought within the field of operation. The side head is mounted directly on the column and there are but two movable joints between the cutting tool and the column. The head extends across the column with a bearing at the center so that all strains are taken on the full width of the column. Rapid power traverse is provided in horizontal and vertical directions for the side head as

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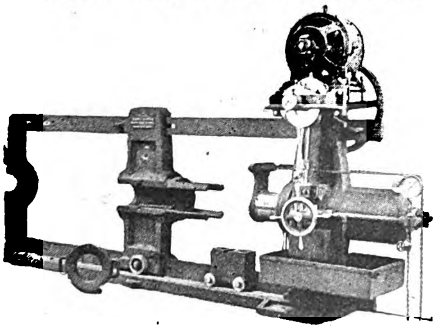
Wheel and Axle Machining

Wheel Press

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond
Company, Hartford, Conn.

CAR wheel presses of 48-in. size have the cylinder member resistance head and end post mounted on a heavy base plate. The cast-steel cylinder is lined with copper expanded into place and burnished. The piston is packed with cup leather.

The hydraulic pressure for working the ram is obtained from a triple plunger pump. Each plunger has a safety valve. All three plungers may be worked simultaneously or any one or any two may be thrown out, giving a variety of pressures that may be exerted on the piston up to the maximum capacity. The pressure is released by a hand wheel operating a relief valve which permits the water to flow back from the cylinder to the suction tank. A gage indicates the pressure on the ram as well as the total pressure in tons. The resistance head is made of cast steel, supported on rollers running on planed ways on the base. An opening permits the passage of axles. The end post has an opening corresponding to that in the resistance head so that long shafts may be handled. Unless otherwise specified trucks are provided to support the wheels in the press and handle them on and off the axles. These machines can be furnished for either belt or motor drive.



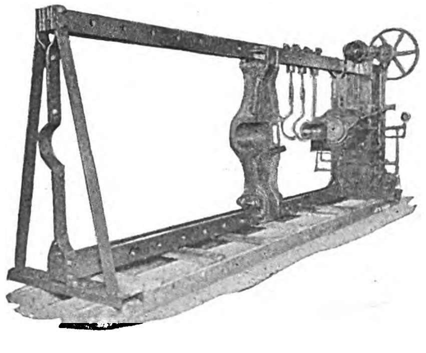
In order to press off wheels from their axles without interfering with the gears a removable attachment with projecting legs can be provided. These legs pass through the holes of the gear wheel and a hinged collar is provided to be placed against the body of the wheel in order to afford a surface against which the wheels can press.

Hydraulic Wheel Press

LOURIE MANUFACTURING COMPANY
Springfield, Ill.

THIS press was designed especially for heavy pressures. Double bars prevent buckling of the press and shaft if the work is not perfectly centered or if more pressure is needed on one side than the other. The crosshead is a steel casting and a steel gate is furnished for the gap. The resistance pins are tool steel. The ram is returned into the cylinder by means of springs. It is hollow, but has a removable disk fitted into the face. The standard equipment furnished includes all hooks, hangers and fittings, as shown in the illustration, as well as a hydraulic gage, safety valve, operating valve and all other necessary valves and fittings. An automatic differential type of pump used operates the ram rapidly under low pressure and slowly under high pressure.

The buttress behind the cylinder is built up of structural I-beams. This permits the use of standard close-grained semi-steel cylinders and pumps. The cylinders are highly polished. Machined cast fillers are placed between the strain bars and the webs of the I-beams. Beams, fillers and strain bars are clamped together by stud bolts.

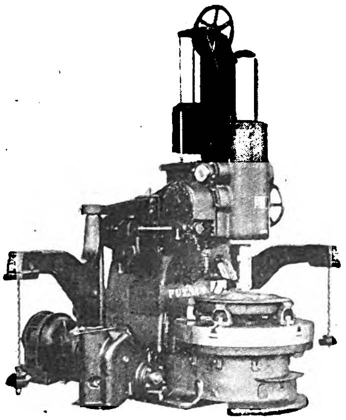


well as the vertical head. Each head has sixteen feeds. Flood lubrication is provided for the spindle bearings, speed change gear unit, the feed gear units and the cross rail elevating mechanism. The machine can be furnished for belt drive through a single pulley or with a motor drive. The floor space required is 81 in. x 93 in. It is made in 36 in. and 44 in. sizes.

48-In. Wheel Boring Machine

MANNING, MAXWELL & MOORE, INC.
Putnam Machine Works, Fitchburg, Mass.

RAPID power traverse in either direction to both the boring and the facing spindles is regularly furnished with this 48-in. wheel-boring machine in addition to the usual power feeds. One lever controls the feed and traverse movements in each case. The chuck can handle wheels from 6½ in. to 42 in. diameter on the tread. The table is driven by a high carbon cast steel bevel gear and a forged nickel steel pinion. The boring spindle is of large diameter and travels in a long bearing. It has ample travel to allow of running the boring bar above the throat of the machine. The boring spindle is equipped with four feeds controlled from the operator's working position. Power traverse to the boring spindle is provided in both directions and is controlled from one lever.



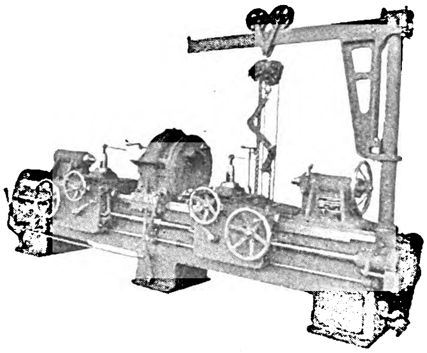
The chuck table has five chuck jaws of hardened steel, conforming in shape to the flange and throat of the wheel tread contour. They are operated universally by a slight motion of one of the three cam studs that are provided so that one will always be convenient to the operator when the table is stopped. If desired, a pneumatic chuck, a hub facing attachment and a pneumatic or mechanical crane can be furnished. The hub facing ram is fitted with a sliding head at its outer end for vertical adjustment of tools. Hubs may be faced while the wheel is being bored.

The drive is through a unit and self-contained gear box giving four speeds in geometrical progression through sliding gears running in oil. If the machine is belt-driven the power is transmitted to the gear box through a constant speed pulley. With electric drive a constant speed motor is geared directly to the gear box. The gear box may be omitted and a three to one variable speed motor geared directly to the table pinion shaft. The machine is started and stopped by starting and stopping the motor.

Double Axle Lathe

MANNING, MAXWELL & MOORE, INC.
Putnam Machine Works, Fitchburg, Mass.

RIGIDITY is said to characterize this axle lathe. The bed is of a deep, box section and the side walls are connected at short intervals by broad box ties. Longitudinal trusses having cast racks, against which the tailstocks are braced, are located between the shears. The legs are cast integral with the bed, one of them being utilized as a tank for the cutting lubricant. The hollow spindle is driven by a herringbone gear and pinion running in a bath of oil, thus affording positive lubrication. The spindle revolves in bronze bearings, one on each side of the main gear. The drive is by means of a double tailed dog which bears against the cast lugs on the equalizing plate. Both tailstocks are adjustable along the bed. Pawls attached to the body engage cast racks in the bed to prevent slipping under a heavy cut. The carriages are guided by V's on the front and rear of the bed and are gibbed on horizontal and vertical surfaces directly in line with the tool thrusts. The feed aprons are of a double wall construction, furnishing a support for all shafts at each end.

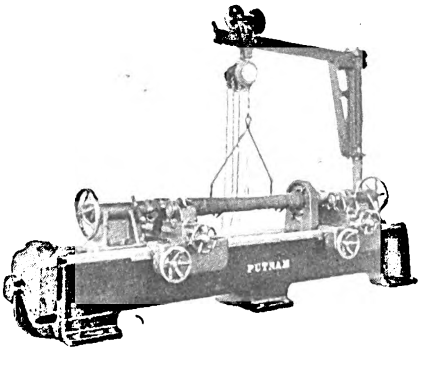


An inclosed feed gear box gives three positive feeds which are changed from the center of the bed. The gears are of hardened steel and run in oil. If desired, a crane can be furnished for lifting the axles in and out of the lathe.

Axle Burnishing Lathe

MANNING, MAXWELL & MOORE, INC.
Putnam Machine Works, Fitchburg, Mass.

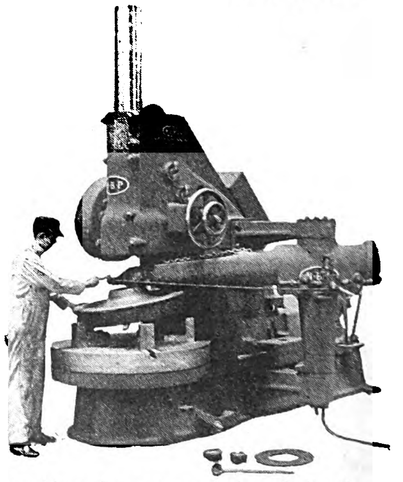
JOURNAL burnishing is the principal function of this machine, which in general consists of two tailstocks and two carriages mounted on a base, each carriage having a front and a rear burnishing tool. Both journals of an axle are burnished at the same time. The bed is of box section. The side walls are connected at short intervals by box ties. The legs are cast integral with the bed. Both tailstocks are adjustable along the bed. Permanent alignment is maintained by means of taper gibs. The two burnishing rolls are brought into contact with the axle by means of a large diameter screw, operating in bronze nuts. The screw is not confined in the carriage endwise, but is free to float, thus the burnishing tools are forced against the axle with equal pressure and no end thrust is taken by the screw or carriage. By setting the burnishing rolls at a slight angle they feed automatically and therefore a feeding mechanism is not required. The aprons contain only the pair of gears and rack pinion for the hand movement of the carriages. A suitable crane can be furnished with this machine. The floor space required with a motor drive and without the crane is 14 ft. 6 in. x 4 ft. 8 in.



48-In. Wheel Borer

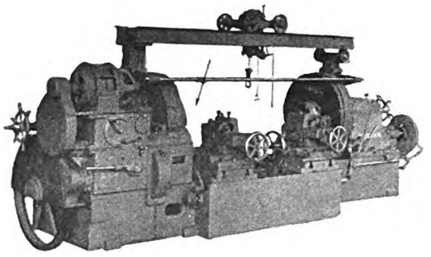
NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company, Hartford, Conn.

IN this line of heavy boring machines a self-contained single casting frame makes for rigidity. There are no joints to allow the boring bar to be thrown out of alignment with relation to the table. As soon as the machine is started the wheel is locked rigidly in the self-centering automatic chuck. Stopping and reversing the operation of the table will automatically loosen the wheel from the chuck. All operating levers and handwheels are within easy reach of the operator. Four feeds are available. Changing from a roughing to a finishing feed is accomplished by means of a single lever. There are tapered bushings for both the boring bar and the table spindle. Either a pneumatic or drum type quick-acting crane can be furnished, as desired. The table revolves in a bath of oil on an annular bearing. The bevel driving gear is of semi-steel and the bevel pinion of forged steel. When so ordered, the machine will be equipped with a hub facing attachment. The hub facing bar feeds from the center outlet, so that it can be used at the same time as the boring bar is feeding downward. These machines can be driven by a constant speed motor, an adjustable speed motor, or a belt, as desired.



48-In. Wheel Lathe

MANNING, MAXWELL & MOORE, INC.,
Putnam Machine Works, Fitchburg, Mass.



WHEELS from 24 in. to 44 in. in diameter on the tread can be turned on this lathe. The bed is heavy, deep and of ample width for the swing of the lathe and it is braced with cross and longitudinal ribs. All bearings are bronze bushed. The spindle and faceplate are made as one piece. Twelve radial T-slots are provided so that either three or four driving dogs may be used. The end thrust is taken by thrust washers running in a bath of oil. The faceplates are driven by forged steel pinions mounted on a high carbon steel shaft which is carried in bronze lined capped bearings. Each faceplate is equipped with four adjustable, equalizing driving dogs. The tailstock has a power traverse by individual motor and a friction clutch allows the motor to be started under no load. The tool rests are designed with an adjustment to take care of the minimum and maximum diameter of wheels.

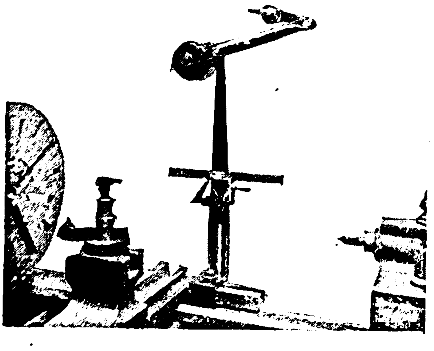
The feeding mechanism gives several impulses per revolution and is practically continuous. The feed ratchets operate in either direction and are of the inclosed type, excluding chips and eliminating accidents to the operator. A simple calipering attachment furnished with each machine enables the operator readily to size both wheels to the same diameter. When desired a pneumatic hoist can be furnished for raising and lowering the wheels. Either inside or outside journal turning attachments, or both, can be supplied. The machine can also be equipped with a wheel boring attachment. If facing the rims and hubs of the wheels is part of the shop procedure, a cross feed can be furnished. These machines can be supplied with a constant speed motor drive, a variable speed motor drive or a belt drive.

Equipment for Electrical Repairs

Mica Undercutter

HULLHORST MICRO TOOL COMPANY
Toledo, Ohio

MOUNTING on any make of lathe carriage through the medium of an angle plate is possible with the No. 9 commutator mica undercutting machine. The main standard is held to the angle plate with two cap screws, which provides for vertical adjustment to take care of commutators up to diameters of 22 in. Regulation of the depth of the undercutting is obtained with the depth gage mechanism mounted on the vertical standard. The lower arm of the undercutter slides on the depth gage bar.



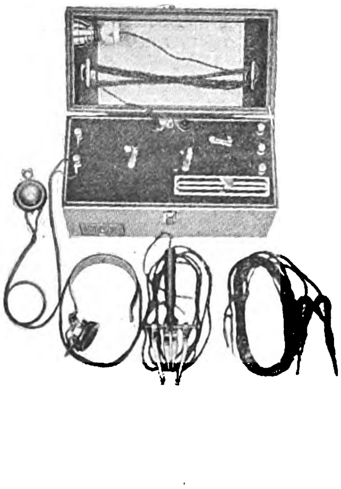
The cutter spindle and the tapering arbor are made of crucible steel lapped into bronze bearings. Sufficient rigidity is assured by building the spindle in the lower arm with a tapering arbor of $\frac{3}{16}$ in. diameter at the cutter.

Mill-cut precision cutters can be supplied for any depth of slot. The motor is installed at the top of one swinging arm and the power is transmitted to the spindle through a belt turning through a triple mechanism at the center pivot. It is stated that this machine will undercut mica $\frac{1}{32}$ in. deep at the rate of more than 200 ft. per hour. The undercutter is furnished with either a 60-cycle, 110-volt a.c. motor or a 110-volt d.c. motor. The swinging arm can be placed out of the way in the upward position when not in use.

Field Tester

CENTURY ELECTRICAL COMPANY
100-102 Randall Avenue, Syracuse, N. Y.

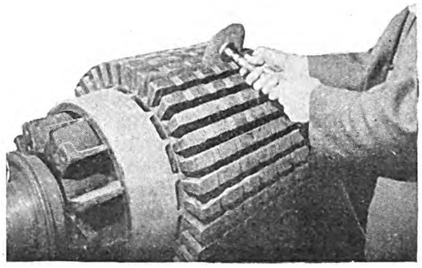
FIELD and armature coils of direct-current motors and generators may be tested conveniently with the New Century field tester. Fields may be checked either in place or out of the machine. By testing them in place there is no danger of removing the wrong coil unnecessarily, while the checking of new or repaired coils previous to installation prevents faults leading to the burning out of an armature or the remaining field coils. A scale shows the exact condition of the coil under test, making it possible to detect partial short or open circuits. In testing armature coils, the Century tester will locate open or short circuits, wrong or crossed connections and grounds without unsoldering any lead wires from the commutator or removing the hoods.



Martindale Slot Cleaning Outfit

MARTINDALE ELECTRIC COMPANY
Box 2660, Lakewood Branch,
Cleveland, Ohio

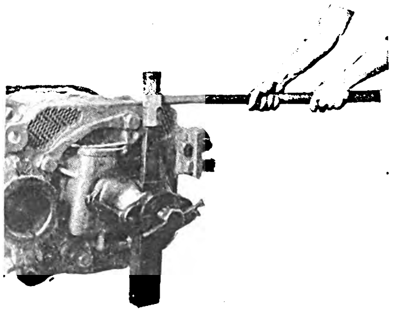
CLEANING the armature core slots by means of grinding disks is the ideal method of removing old insulation prior to the rewinding of the armature. It saves 75 per cent of the time and labor required for the usual cleaning process. The machine shown will perform this work and in addition will remove quickly old solder from the riser slots. With the addition of a fiber stiffener between the disks, burrs that will turn a file can be ground off easily. A complete outfit consists of a motor, flexible shaft, ball bearing handpiece disk holder, 36 assorted grinding disks, three fiber stiffeners and a box of shaft grease.



Pinion Puller

GENERAL ELECTRIC COMPANY
Schenectady, N. Y.

SPLIT rings are used with this pinion puller, each half being provided with lugs through which hinge pins are placed to hold the two firmly together. The wedging principle is used, but the wedge, instead of being where it can damage bearings and housings, is placed where it can do no harm. The puller ring grips all the pinion teeth equally, eliminating the possibility of damaging a number of teeth.

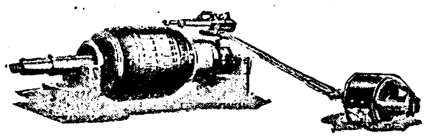


The component parts of the pinion puller are the puller ring, the pressure cap if required, the jack-screw, the wedge box, the wedge and the hinge pins. The wedge, wedge box and jack-screw are the same for all pullers, but the puller rings and pressure caps vary with the pinion for which the puller is required. A common ring may be used in some cases for pinions varying only slightly in diameter.

Commutator Grooving Machine

GENERAL ELECTRIC COMPANY
Schenectady, N. Y.

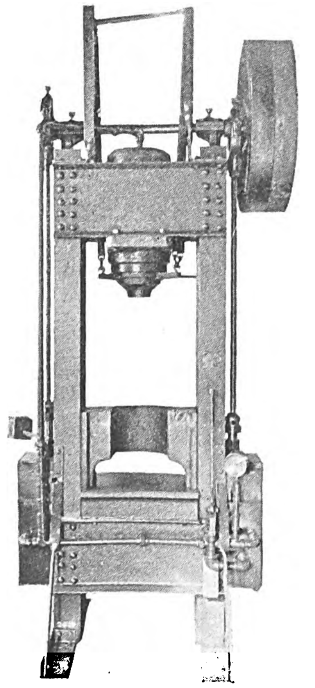
COMMUTATOR grooving machines of two types have been developed by this company, one portable and the other stationary. In form 2, the stationary machine, the base has adjustable pillow blocks with V-shaped bearing surfaces and brass rollers. The slide arm is designed for both vertical and angular adjustment, the latter to be used where the commutator bars are not exactly parallel to the shaft. The rotating saw is mounted on an extension of the motor shaft supported by an offset bearing. This readily permits the grooving of commutators having ears. Owing to the small size of driving motors used no starting resistance is necessary. The form 3 portable machine is simple and can be moved readily to any part of the shop. It is designed to be clamped to the armature shaft. This machine has adjustable stops which direct the travel of the saw to the brush surface of the commutator. A floating driving shaft permits the grooving of a number of slots at one setting of the armature. An angular adjustment can be used when the commutator bars are not exactly parallel to the shaft.



Inverted Forcing Press

LOURIE MANUFACTURING COMPANY
Springfield, Ill.

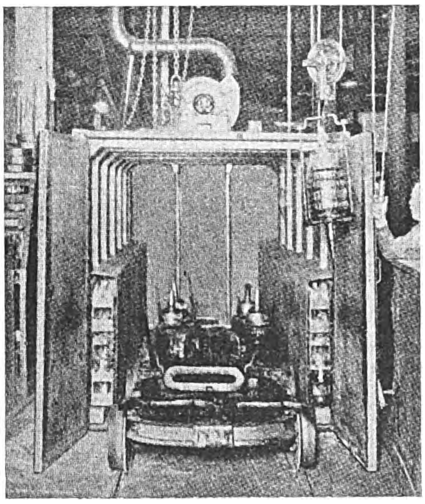
STRUCTURAL steel I-beams and channels hot riveted are used in this inverted forcing press. It is a complete self-contained unit. The pumps, most of the valves and the piping are inclosed in the oil reservoirs on the side. This eliminates leakage around the press. Leakage oil from the ram is carried to the reservoir by a telescoping pipe. The ram is returned into the cylinder by means of springs. The two pumps used on this press are of the differential type and work automatically. Two large pistons operate the ram rapidly under low pressure. When about one-seventh of the total pressure capacity of the press is reached the large pistons cease to function and the small pistons produce the heavy pressure. The press as shown is suitable for forcing, straightening, bushing work, etc. A hydraulic gage and a safety valve are furnished as a part of the equipment.



Electric Ovens for Baking Armatures

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.

TYPE M electric oven is of the kiln type, consisting of an insulated room into which the work to be baked is wheeled on trucks or supported on angle brackets on the oven walls. The inside and outside walls are sheet metal and the 2-in. space between them is filled with high-grade insulation. The angle framework is bolted together and tie rods hold the sections firmly in place, making the oven capable of withstanding the heavy service of railway work. Sides, top and bottom are all of similar construction, giving the oven a high thermal efficiency. The heaters are placed on the side walls and, if conditions allow, along the middle of the oven floor, since this method gives better heat distribution. A wire screen protects the heaters from injury through contact when loading or unloading the oven. Ventilation is by a fan blower system, which increases the drying rate and prevents explosions. The control may be mounted on the side of the oven or separately, depending on which will be more convenient.

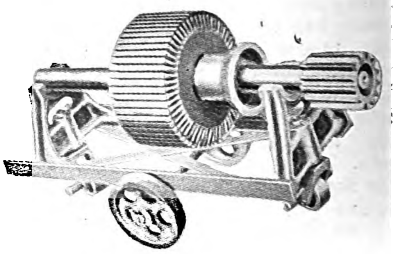


The temperature of the oven is held at the proper point by a sensitive thermostat. It is possible to maintain a temperature within 5 deg. F. of the desired point by this means. This control instrument actuates a magnetic contactor control panel which opens and closes the circuit supplying power to the oven and the temperature rises or falls. It is made in three sizes, M-107, M-109 and M-114. The M-107 size will handle six armatures per bake, the M-109 will handle eight armatures and the M-114 twelve armatures.

Armature Buggy Occupies Little Space

COLUMBIA MACHINE WORKS & MALLEABLE IRON COMPANY
3303 Atlantic Avenue, Brooklyn, N. Y.

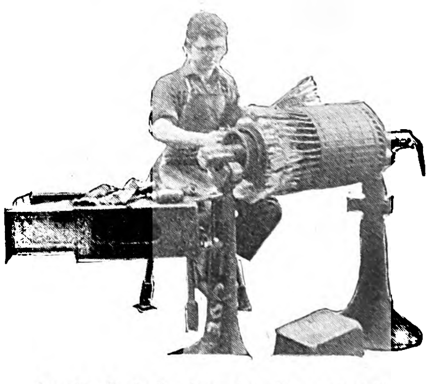
VERY small space is occupied by this adjustable buggy. Due to its adjustable features it is suitable for the reception of any size of motor armature. This adjustment is made by loosening two thumb screws located on the left-hand side of the frame and shifting the pedestals to the desired centers. A buggy of this type used for the transportation of armatures will reduce the possibility of injuring the commutators, shafts, etc. It is made of iron and strongly constructed throughout.



Adjustable Armature Stands Facilitate Repairs

COLUMBIA MACHINE WORKS & MALLEABLE IRON COMPANY
3303 Atlantic Avenue, Brooklyn, N. Y.

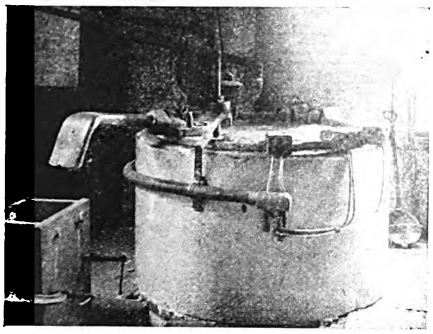
THESE armature stands are substantially made with a broad circular base, a low center of gravity and a screw to obtain a 10-in. height adjustment. The screw threads are made square in order to facilitate handling. Roller bearings in the cradles provide a means for the easy revolving of an armature as well as eliminating mechanical injuries to the armature shaft. Two pockets cast on the side of the stand provide receptacles for the brackets to support the workman's tool and material tables. These stands can be adapted to many repair jobs about the shop.



Electrically Heated Babbitt Melting Pot

GENERAL ELECTRIC COMPANY
Schenectady, N. Y.

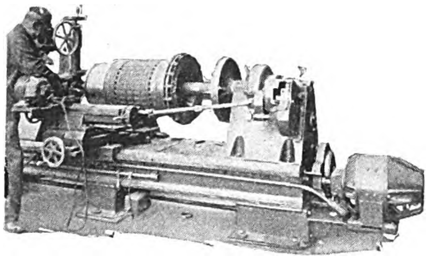
NEARLY all armature, axle and journal bearings for electric car equipment are rebabbitted. For this a conveniently arranged system for melting the babbitt is essential. To meet the requirement the General Electric Company has developed several different sizes of electric melting pots. The one shown in the illustration has a capacity of 5 tons. It is equipped with six cast-in heating units, each of 5 kw. capacity. This will melt 1,000 lb. of babbitt per hour. Temperatures of from 700 to 775 deg. F. are maintained by thermostatic regulation.



Banding, Slotting and Turning Machine

LEA COURTENAY COMPANY
Newark, N. J.

ON THIS machine an armature can be turned, slotted and banded without removing it. The machine is especially designed to handle heavy armatures such as are used on subways, elevated railways or interurban lines. The banding equipment is furnished with a device which can be adjusted to any given tension. An individual motor is used to drive each part.

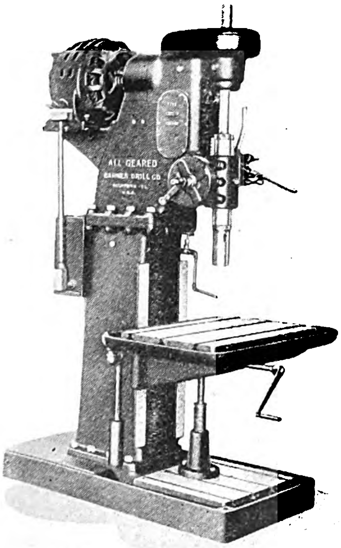


Machine Shop

Ball Bearing Geared Drill and Tapper

BARNES DRILL COMPANY
814-830 Chestnut Street, Rockford, Ill.

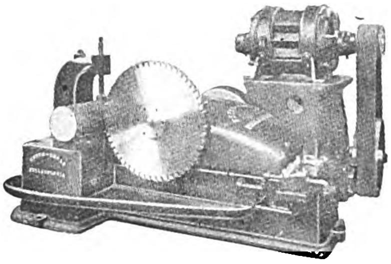
CORRECT speeds and feeds for any one size of twist drill from ⅜ in. to 1½ in. can be obtained on the machine shown. Its direct-connected motor drive through a multiple disk clutch gear provides for simplicity and convenience of control. All important shafts have radial ball bearings and a fixed splined spindle has a roller thrust bearing. The self-oiling system lubricates all radial ball bearings and gears. The gearing throughout is alloy steel and all important gears are heat treated. A 5-hp., 1,200-r.p.m. motor is recommended. The star wheel handle is conveniently located on the right-hand side of the machine. A table with a finished working surface of 27 in. x 17 in. is surrounded by oil channels. The rack is dovetailed to the sleeve and no screws are used. A counterbalance chain facilitates the quick return of the spindle. An added feature is a safety device to prevent overloading and minimize breaking of drills. There is an automatic stop, giving full spindle travel. The height of the machine is 75 in. and it occupies a floor space 34 in. x 48 in. The net weight without motor and starter is 1,750 lb.



Cold Saw Cutting-Off Machine

ESPEN-LUCAS MACHINE WORKS
Front Street and Girard Avenue,
Philadelphia, Pa.

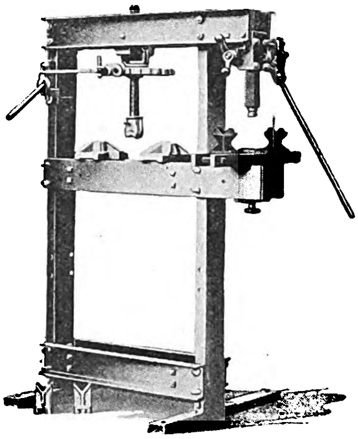
BARS, billets and other steel shapes can be sawed quickly on this machine. The housing and other principal castings are made of gray iron having thick walls and heavy webs. Spindle, driving gears and other working parts are made of high carbon steel forgings. The driving worm gear and main bearings are of bronze. Roller bearings take care of the heavy thrust. A self-priming pump supplies the lubrication for the saw. The feed, as well as the quick traverse in both directions, is accomplished by means of a low-pressure oil feed system. All speeds of traverse, including feed variation, are controlled by the movement of conveniently located levers. Automatic control can be had at the limits of the traverse, or at points determined by the operator. The machine can be operated by individual motor drive or from a countershaft, as desired.



Forcing Press

MANLEY MANUFACTURING COMPANY
York, Pa.

CAPACITY of 35 tons is obtained in the new Manley Press. Five leverages are used to change quickly from one speed to another, thereby enabling the operator to use the power best suited for the job. To change the leverage it is only necessary to slide the retaining collar forward, lift the connecting link and drop the pin in the proper hole, using either the first, second or third leverage. The press has a winch-operated table which is raised or lowered through a chain working on two drums and controlled by a handle. A counterweighted handwheel suspended on ball bearings is used. The frame is of an open type which permits of long work such as shafts, small axles, etc., passing through the frame in a central position for straightening.



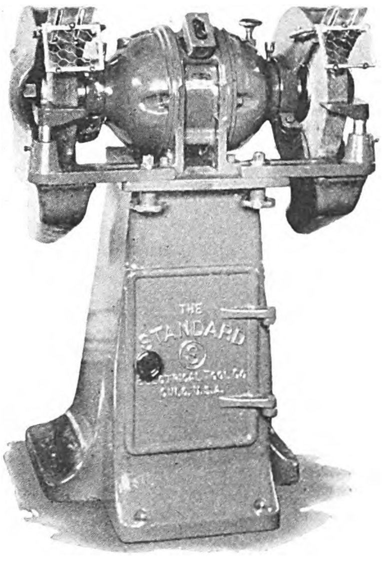
Quite often a bearing is rusted or frozen so that pressure alone will not remove it. The upper end of the 4-pitch Acme thread screw used in the press is so placed that it may be struck with a heavy hammer without injury. The leverage of the press is in the ratio of 4,800 to 1. High-speed leverage is used when pressure up to 8 tons is required. Ten notches on the hand wheel are obtained at each stroke. The high-speed screw leverage eliminates the criticism against screw pressure being too slow. The lever bar is placed at a suitable working height for full muscular action when pulling on it. The stroke is also made with the operator in such a position that he can see exactly what he is doing and just what is taking place on the pressing job. The frame is of bolted construction.

An independent rack and pinion press is also furnished with this outfit and is a separate and complete unit from the screw press. This can be used for small work. Leverage on this press is 44 to 1 and it has a capacity of 3 tons. The floor space required is 30 in. x 52½ in.

3-Hp. and 5-Hp. Improved Pedestal Grinders

STANDARD ELECTRICAL TOOL COMPANY
1938-46 W. Eighth Street, Cincinnati, Ohio

ELECTRICALLY driven grinders of this type are made in two sizes, 3 hp. and 5 hp. capacity, A General Electric motor and GE push-button control are furnished. The control is located on the inside of the pedestal or base of the grinder. The armature shaft is made of 3½ per cent high grade nickel steel. SKF ball bearings are used, incased in dust-proof chambers. Guards of the hinged door type with exhaust connections protect the emery wheel. The guards are equipped with a spark breaker, also a polished wire-glass adjustable eye shield.

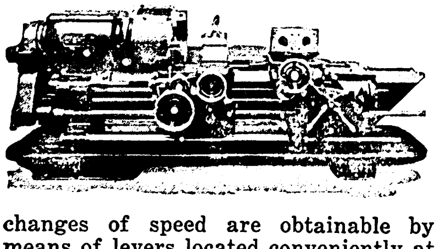


The 3-hp. grinder is equipped with emery wheels 12 in. x 2 in. or 14 in. x 2 in., as preferred. The 5-hp. grinder is equipped with emery wheels 18 in. x 3 in.

Turret Lathe

GISHOLT MACHINE COMPANY
Madison, Wis.

BED, headstock and bearing housing of this turret lathe are cast in one piece. By extending the headstock walls above the top of the turret housing an oil-tight reservoir is formed for the splash oiling system. The machine is driven by a single pulley. Eight changes of speed are obtainable by means of levers located conveniently at the front. All gears are made of treated alloy steel and a multiple disk clutch transmits the power. The transmission shafts are mounted on ball bearings. An outstanding feature is the short distance between the bearings.



The full swing feature of the side carriage eliminates interference of the square turret with the tools of the hexagon turret. Aprons of both side carriage and turret carriage are self-contained, each having complete independent feeds, lead screw, rapid traverse, automatic feed and traverse trips, screw-cutting index, micrometer dials and selective feed levers. Each carriage and the cross slide have micrometer dials. The feeds are all positively geared and eight changes of feed, forward and reverse, are provided in each apron.

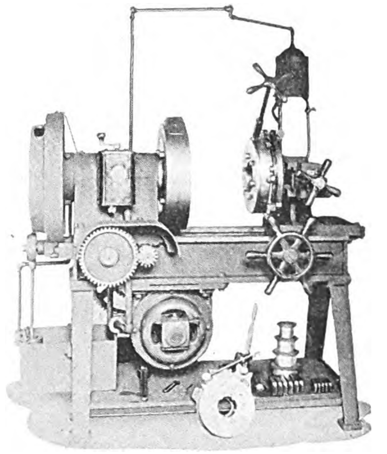
Independent longitudinal feeds permit the use of any one of the coarse or fine feeds of one carriage irrespective of the feeds on the other. One set of eight chain gears is provided for cutting all standard threads up to two per inch.

Each carriage has a separate rapid traverse independent of the feeds. The automatic feed trips are a feature. The 3-L machine occupies a floor space of 67 in. x 135 in. and the 4-L machine 80 in. x 190 in.

Motor-Operated Pipe Threading and Cutting Machine

D. SAUNDERS' SONS, INC.
Yonkers, N. Y.

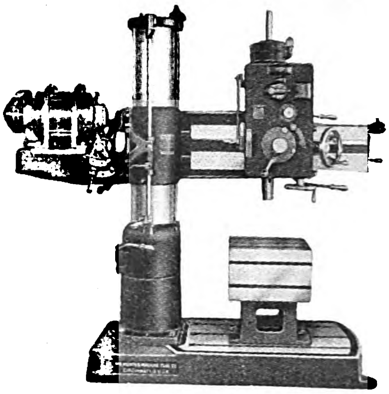
PIPE from ½ in. to 4 in. inclusive can be threaded and cut with the 4B machine, while the 5D machine cuts and threads pipe 1 in. to 6 in. inclusive. Where desired these machines can be furnished with a bolt-threading attachment. The machine is suitable for operation by either a.c. or d.c. A 5-hp. constant speed motor with a drum type controller designed for forward and reverse operation is direct geared to the driving shaft of the machine. Sufficient gear changes are furnished to obtain the correct cutting speed for all sizes of pipes within the capacity of the machine. The cutting off head is arranged with a tool slide and self-centering V jaws to steady the pipe being cut off. A handwheel connected to a rack and pinion moves the carriage containing the cutting off head and the die head. The die head slides on ways and permits it to be brought close to the gripping chuck for holding the pipe, which is of the standard universal type. The pipe is centered by a two-jawed self-centering chuck mounted at the rear end of the spindle on the side of the large driving gear. An automatic oil pump supplies a constant flow of oil to the chasers and cutting off tool.



Heavy-Duty Radial Drill

MORRIS MACHINE TOOL COMPANY
Cincinnati, Ohio

MORRIS radial drills are arranged for electric drive with the motor mounted on the arm. They are made in sizes of 3, 3½ and 4 ft. The head is fully inclosed and balanced on the arm. The spindle is a hammered steel forging running in bronze bearings in the sleeve and driven by two keys. It is fitted with a ball thrust bearing and the spindle gear is mounted on ball bearings. The helical spindle gears are made of alloy steel, heat-treated and hardened. Feed gears are of steel, heat-treated and hardened. The feed unit is mounted in the head. There are six feeds on the 3-ft. and 3½-ft. drill, ranging from 5 to 30 thousandths of an inch per revolution of spindle. On the 4 and 4½-ft. radial there are eight feeds ranging from 5 to 42 thousandths per revolution of spindle and four thread leads, 8, 11½, 14 and 18 threads per inch.

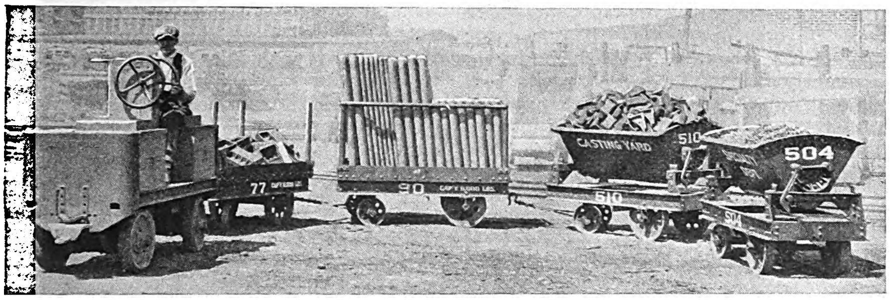


The tapping attachment and back gear bracket is a unit mounted on the back of the head. The back gears, back gear clutches, spindle gears and feed gears are made of chrome nickel steel, heat-treated and hardened. A sliding gear speed box is equipped with ball bearings. The alloy steel gears run in oil. A speed chart at the change-speed lever permits the operator to select quickly any one of the spindle speeds. The column or sleeve is mounted on an inner column which extends through to the top and revolves on ball bearings. The column is of semi-steel, ground to size. The arm is designed to resist torsional and lifting strains. The ribbed base is fitted with T-slots.

Trailer Trucks

AMERICAN CAR & FOUNDRY COMPANY
30 Church Street, New York

TRAILER trucks of this type are especially designed to withstand heavy loads and rough usage. The frames are of channel and angle steel, hot riveted with corners gusseted. The bodies are of sheet steel reinforced with angles and bands. Cast-iron wheels with self-contained roller bearings and Alemite pressure lubrication are mounted on high carbon steel axles, heat treated to a Brinell hardness of 250. Pressed steel caps are shrunk on the ends of the wheel hubs, making a close fit around the axle, keeping out



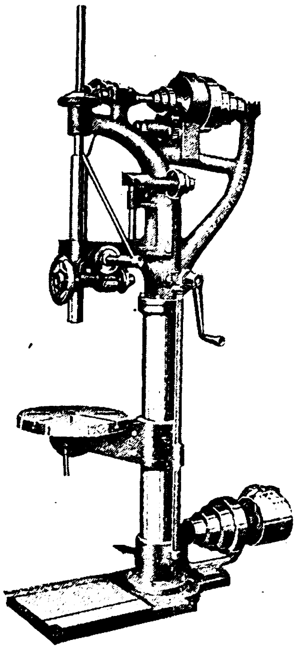
the dust and dirt. Each trailer is equipped with a rear drop forged gravity coupler hook to permit of train operation. Due to the counterweight it automatically locks and cannot be jarred open by rough roads.

These trailers are made with a gondola body or a dump body. The gondola body is adapted to the handling of miscellaneous loose material and crated or boxed material. The body has removable corner posts and if desired can be equipped with a special bolster for handling long material, loaded on two trailers. The dump body is self-clearing and automatically locks itself in the upright position after its return from dumping. The gondola trailer has a capacity of 6,000 lb. and the dump trailer has a capacity of 24½ cu.ft. or 6,000 lb.

Back Geared Upright Power Drill

BUFFALO FORGE COMPANY
Buffalo, N. Y.

INSTANT change from a plain to a back gear drive without using a wrench is possible in the machine shown by disengaging a knurled knob in the top gear and throwing in the back gears with a hand lever. A locking screw is provided for holding it in place. An adjustable automatic trip throws out the power feed when the piece has been drilled to the required depth.

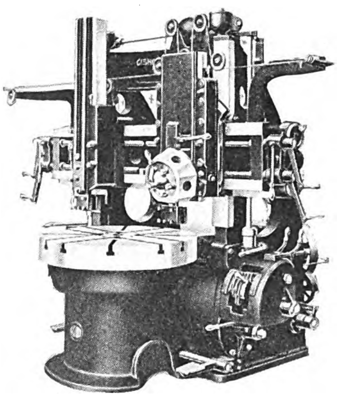


The ball bearing spindle is graduated and ground. The lever handle is adjustable from 6 to 18 in. and is held in place by a tension spring. All bearings are split and adjustable for wear. The latch hinged worm feed wheel runs in oil. All gears are machine cut and are fitted with heavy bronze bushings. With spindle travel of 14¼ in. the machine is amply fitted to handle reboring work with ease. It weighs 1,100 lb. If desired, the machine can be furnished with a direct-connected motor.

Vertical Boring and Turning Mill

GISHOLT MACHINE COMPANY
Madison, Wis.

TWO plain swivel heads are features of the machine shown. A driving pulley is geared to a friction back-geared headstock having six mechanical speed changes which, in connection with a two-speed countershaft, provides twelve changes of speed to the table, all in geometrical progression. The plain table has four pairs of parallel and four radial T-slots. The feed change levers, rapid traverse levers and table control levers are located on both sides of the machine together with a foot brake at either side. Two plain independent heads, furnished with the machine, can be swiveled to any angle from 45 deg. from the vertical. The ram is a box section type having a 3½-in. central core extending through the entire length. The bore for the tool holder is 3 in. diameter. Ten mechanical changes of feed are obtainable for each head. A feature is a device to eliminate breaking of gears and other parts. The micrometer index dials reading in thousandths of an inch facilitate accurate setting of tools.



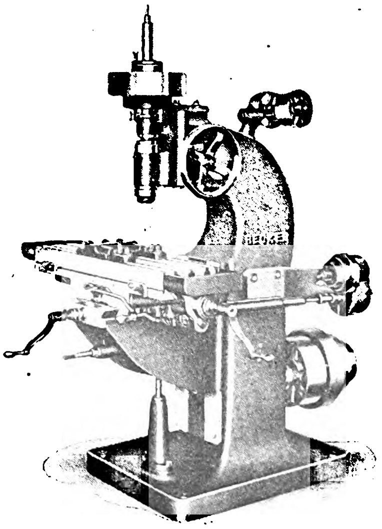
A feed tripping device stops the feed automatically at any predetermined point. In addition, safety stops trip the feed before the head reaches the end of the travel. Rapid traverse enables the operator to move the head quickly by power in either direction. The ratchet handles on the feed rods disengage automatically when the feed or rapid traverse is used, thus eliminating chance of injury to the operator caused by revolving handles. All feed gears and other gears subjected to heavy duty are made of steel. A two-speed tight-and-loose pulley countershaft is standard, but a motor drive is easily installed without increasing the floor space occupied, which is 97 in. x 120 in.

Improved Die Sinker and Vertical Milling Machine

REED-PRENTICE CORPORATION
Worcester, Mass.

LIKE other Becker machines, the model shown is supplied with an adjustable auxiliary head which keeps the spindle in perfect alignment. The spindle is made of high-grade steel with ground main bearings running in taper bronze bushings, adjustable for wear. Belt pressure of the spindle guiding pulley is taken by ball bearings supported in brackets at the top of the column. The main spindle has ball bearings at top and bottom. The table, of liberal proportions, has power longitudinal feed in either direction. The feed of the table is through a pair of three-step cones. Two additional changes can be effected by means of a pull gear on the feed box, to which the telescopic shaft is attached. Head, table, carriage and knee are furnished with adjustable gibs for taking up wear. The machines can be arranged for a single pulley gear box drive, if desired, which will permit of a direct drive from the main line without a countershaft. This machine is also suitable for direct motor drive. Where a constant speed motor is installed, it is necessary to provide a gear drive. This drive will provide fourteen spindle speeds ranging from 20 to 500 r.p.m. The quick changes in speed are obtained through two handles conveniently located on top of the gear box. For this method a 3-hp. constant-speed motor of 1,150 or 1,200 r.p.m. is recommended.

Where a variable speed motor is furnished it is not necessary to provide a gear box, since a spindle variation from 25 to 500 r.p.m. can be secured by means of shifting the handle of a regulating rheostat, located on the side of the machine.

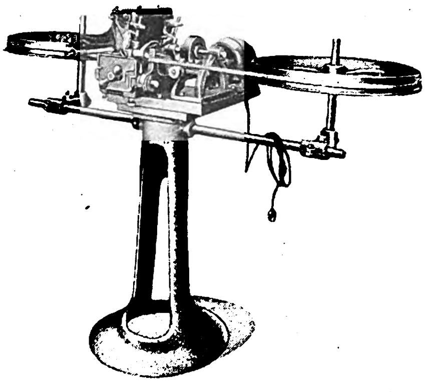


The floor space required for this machine is 74 in. x 60 in. x 75 in.

Machine for Filing and Setting Band Saws

WARDWELL MANUFACTURING COMPANY
110-112 Hamilton Avenue, Cleveland, Ohio

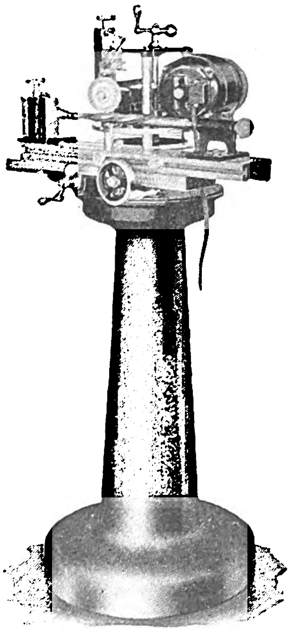
FILING, setting and joining of band saws all in one operation can be done by this machine. It will handle saws from ⅛ in. to 2 in. wide. Motor or belt drive can be furnished as desired. By the positive and powerful movement of the file all spring or medium tempered band saws can be accurately filed and set at a speed of 70 ft. a minute.



Circular Relief Grinder

CLEVELAND TOOL ENGINEERING COMPANY
Main and West 25th Streets, Cleveland, Ohio

YEARS of experience, development and expert engineering are claimed to have produced an original circular relief grinder that effects economy unapproached by the older methods of relief grinding. It has proved its worth in time, labor and money saved and in superior precision of the work.



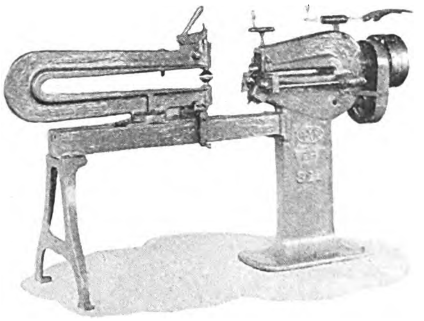
Grinding of the relief in a proper and economical manner can be performed on such tools as adjustable reamers, tapper taps, milling cutters, face mills and boring heads, core drills and various other tools. Where two or three distinct operations are usually needed to grind tools, it is said that the grinder shown will perform the entire work in one operation. The outside face of the wheel is dressed concavely to exactly the same curve as the tool to be ground. The tool is then offset from the center of the wheel curve to give the desired clearance. Then it is ground to the cutting edge. The circular relief leaves the outside of the tool convex with all the metal possible to support the cutting edge. The clearance is determined by the distance the tool is moved in or out against the curve of the grinding wheel.

Sheet Metal and Forge Shop Equipment

Power Ring and Circular Shear

PECK, STOW & WILCOX COMPANY
Southington, Conn.

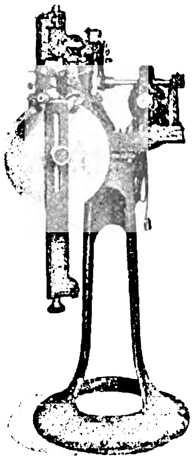
CIRCLES or internal rings and irregular curves can be cut on this ring and circular shear. Clamping disks are provided with center points and blanks and are held securely between clamping disks and released through an eccentric lever. The circle arm moves easily and freely by means of a rack and pinion and hand crank. The angular position of the cutter and the ability to raise and lower the upper cutter through a handwheel enable one to cut circles from square blanks, or to cut inside circles without cutting the outer edge. This machine is furnished regularly with tight and loose pulleys.



Turning, Wiring and Burring Machine

PECK, STOW & WILCOX COMPANY
Southington, Conn.

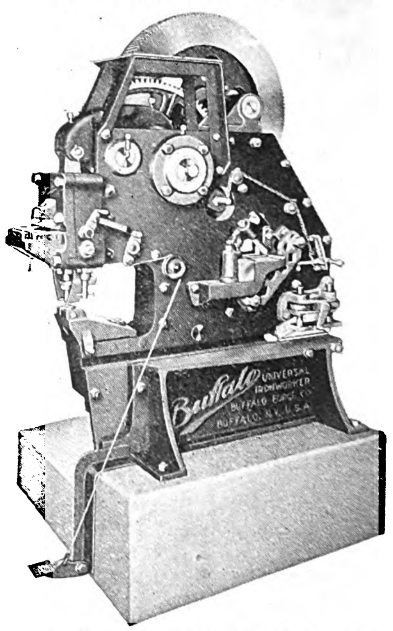
VARIOUS operations can be performed with the necessary additional rolls by this self-contained unit. With the belted motor drive the speed of rolls for turning, wiring or burring operations can be changed by simply changing the size of the motor pulley. It has a capacity for No. 16 gage steel and lighter and its turning capacity is for No. 16 gage steel with ¼ or 5/16-in. wire or No. 18 gage steel with 3/16-in. wire. With wiring rolls the capacity is No. 16 gage steel with ⅛-in. to 5/16-in. wire and with burring rolls No. 16 gage steel. The machine is furnished with a pulley drive and treadle friction clutch attachment. All bearings are bronze bushed.



Armor Plate Universal Iron Workers

BUFFALO FORGE COMPANY
Buffalo, N. Y.

BUFFALO armor plate universal iron workers are complete, reliable and modern machines for cutting metal. With one of these, rounds, squares, angles, tees, beams and channels can be cut and shear plates, flats, girders, H-columns, I-beams and angles punched. With a few special tools, angles, channels and I-beams can be coped. These machines are made in four sizes, No. ½, 1, 1½ and 2. The same design is used on all models. There is a punch at one end and a slitting shear at the other with a bar cutter adjacent to the shear. The machines are supplied with a high and low die block and long and short punch holder. The triple punching attachment may be used on the machine if desired. The shear knives are suitable for slitting plates of any width or length as well as for flats. An exclusive feature of the machine is the stripper used on the shear.



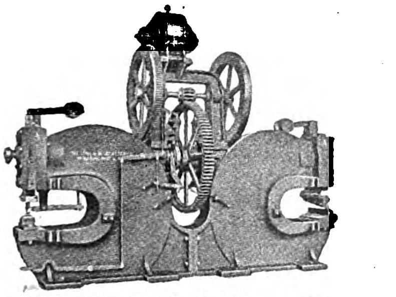
This is operated by means of a crank requiring no tools and is very wide to permit cutting short pieces of plates or flats. The bar cutter has five-piece knives so that replacement and sharpening are easy and inexpensive.

These machines, like all other Buffalo metal working machines, have frames of rolled steel armor plate, guaranteed forever against breakage. Due to the heavy cast-iron base a concrete foundation is unnecessary. The gear and pinions are made from machine cut steel.

Punching and Shearing Machine

LONG & ALLSTATTER COMPANY
Hamilton, Ohio

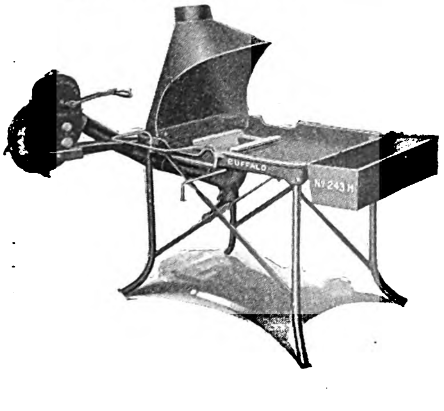
PUNCHING and shearing machines of this type have the slide counterbalanced and fitted with a bronze gib for taking up wear. Camshaft and pintle are made of steel. Bronze bushed bearings are furnished for the main journal and the cam pintle. The clutch is made of high-carbon cast steel and the face is fastened to the main spur wheel by means of a tongue, groove and bolts. It is detachable, providing for renewal of worn parts. An automatic stop will throw out the clutch at the completion of each stroke and may be adjusted for any point of the stroke desired. The camshaft may be turned by hand for any adjustment.



Standard Blacksmith Forge

BUFFALO FORGE COMPANY
Buffalo, N. Y.

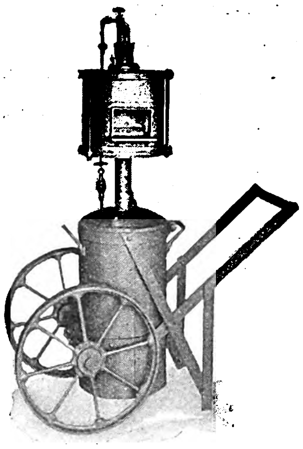
FORGES of the type shown are equipped with the No. 200 ball-bearing silent blower with a 14-in. fan. The forge has a cast-iron hearth mounted on four steel pipe legs and reinforced with cross-bar braces. A steel half hood vulcan tuyère is part of the regular equipment. The gear ratio of the blower is 47½ to 1. The fire pan is 28 in. x 40 in. and the net weight of the entire outfit is 273 lb.



Oil-Burning Rivet Forge

BUFFALO FORGE COMPANY
Buffalo, N. Y.

INCONVENIENCE and danger from flying sparks in heating rivets are overcome by using the oil-burning rivet forge shown. This forge consists essentially of a welded steel oil tank on which is mounted a head or fire chamber. This head is made up of a cylindrical steel plate housing held between cast-iron top and bottom plates by means of three through bolts. The lining is a one-piece circular firebrick 2 in. thick made of the best quality of refractory material. To replace the old lining it is necessary only to unscrew three nuts and lift the top off the fire chamber. The oil tank is tested with air at a pressure of 125 lb. Air is supplied through a single connection which furnishes pressure for the oil supply as well as air for the atomizer. It will burn kerosene, distillate, or any fuel oil. The tank has two convenient handles, one on either side. A forge mounted on a truck as shown makes an ideal arrangement for portability.

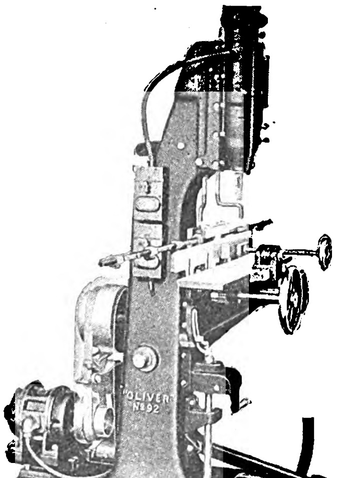


Woodworking Machinery

Power Feed Hollow Chisel Mortiser

OLIVER MACHINERY COMPANY
Grand Rapids, Mich.

USE of a rigid, hollow, box type, one-piece casting having a wide flanged floor support for the column features this hollow chisel mortiser. The column incloses the power feed mechanism, with the exception of the drive pulley. A built-in fan blower behind the column furnishes a constant air blast for cooling the tools and keeping the work free from chips. The mortising ram or plunger reciprocates in adjustable gibbed ways and has an adjustable travel from 2½ in. to 4 in. long, controlled by the treadle for single or continuous power feeding strokes. The machine will handle chisels from ¼ in. to ¾ in. square. Hollow chisels with 4-in. blades will mortise in 12-in. high material.

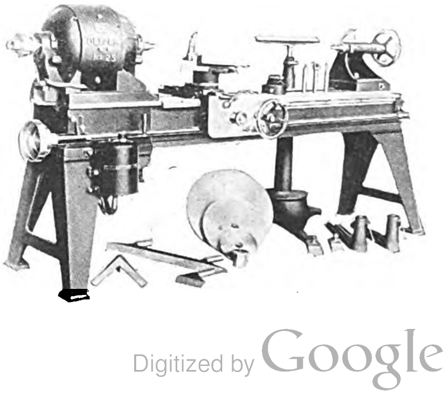


A universal compound table with screw clamp for 6-in. wide stock and a handwheel, rack and pinion for longitudinal travel, gaged by adjustable stops, are regularly furnished. The table is 36 in. long, 6 in. wide, 32 in. above the floor at the lowest position and 44 in. at the highest. It is fitted with a vertical adjustable back fence having a lip hold down and carries a 6-ft. layout stop rod with six spring stops for automatically locating mortises. A rod and two adjustable stops directly in front of the table govern the length of the mortises. The floor space required for the machine is 3 ft. x 5 ft.

Motor Head Pattern Lathe

OLIVER MACHINERY COMPANY
Grand Rapids, Mich.

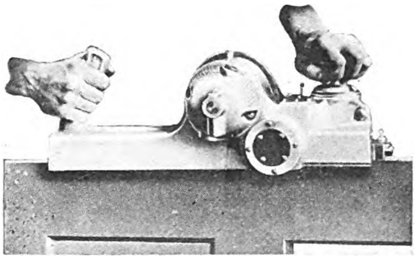
PATTERN lathe No. 25, shown in the illustration, is made in three sizes, 16 in., 20 in. and 24 in. swing. The head incloses an Oliver direct-current motor of 2-hp. capacity whose speed can be varied from 400 to 2,000 r.p.m. The armature shaft is made hollow for faceplate work and with suitable take-up for end thrust. The front end of the shaft is bored for Morse taper. Ordinarily a drum type controller with proper resistances is attached to this machine. The tailstock is made with a strong spindle and bored for Morse taper. The iron bed can be furnished in any length from 6 ft. upward, advancing by 2-ft. sections. All sizes of lathes are provided regularly with power feeding carriages, but hand-feeding carriages can be substituted.



Electric Hand Plane

WAPPAT GEAR WORKS
Meade Street and Braddock Avenue,
Pittsburgh, Pa.

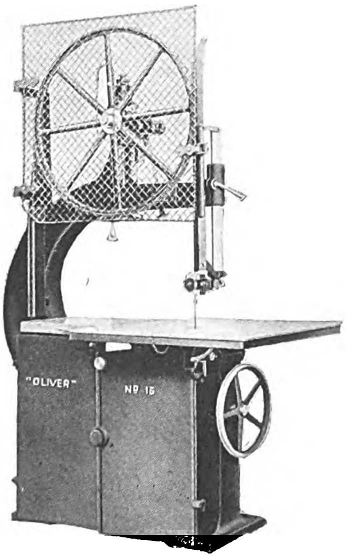
THIS electric hand plane can be used on doors and sash. The cutting is done by a jointer head which is driven through gears from a $\frac{3}{10}$-hp. universal type motor that operates from any light socket. The short shoe at the front of the plane and just ahead of the cutter can be raised or lowered by turning a knob with the left hand, thereby regulating the depth of cut. A graduated dial at the base of the knob enables the operator to set the knife for any cut from zero to $\frac{1}{8}$ in. This adjustment feature is unique in that by turning the knob forward or backward while advancing along the material it is possible to vary the depth of the cut and smooth out any high spots in one stroke. Another interesting feature is the beveling attachment, which can be set to cut accurately any required bevel on the edge of a door or sash. The body of the tool is aluminum and the total weight is 19 lb. It is easy to handle and simple to operate. The high speed blades in the cutter are easily removable for sharpening.



Band Saw

OLIVER MACHINERY COMPANY
Grand Rapids, Mich.

BASE and column arm of this machine are cast in one piece. The main table is carried on rockers for the angle adjustments. The table can be tilted both ways by means of a worm gear and hand wheel at the right of the operator. An auxiliary table is supplied between the column and the work table. The upper and lower wheels, of 38 in. diameter, are made of cast iron. The lower one is inclosed in a metal casing, provided with two doors. The wheel shafts are fitted with machine ground journals and are mounted on tapered babbitted bearings. Each bearing has an oil well and cap. The upper shaft and bearing are adjustable vertically to suit various lengths of blades.



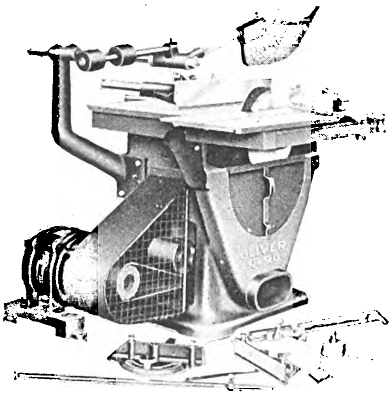
An outboard bearing which supports the lower wheel shaft is bolted to the frame. Saw tension is adjusted by a telescope spring. A guide post made of square steel is counterbalanced by an incased coil spring and can readily be locked in a fixed position. A grooved wooden saw guard on the column protects the saw on both sides. A steel front guard with a wood facing is carried on the guide post and covers the saw above the guide.

The main table is 36 in. x 40 in. and is designed to tilt 45 deg. to the right and 5 deg. to the left. The auxiliary table is 21 in. x 22 in. The floor space occupied by the machine shown is 68 in. x 54 in.

Universal Saw Bench

OLIVER MACHINERY COMPANY
Grand Rapids, Mich.

UNIVERSAL saw bench No. 90 is furnished with a cored form ribbed for strength with a wide flange at the base. A metal partition divides the saw from the balance of the working parts and prevents the sawdust from penetrating to them. The metal table has two sections, one stationary and the other arranged to slide past the saw. An extension bracket at the right supports the fence when ripping stock the maximum width. The table will tilt to an angle of 45 deg., the movement being controlled by means of a handwheel engaging a worm and gear. The movable table is mounted on a tongued cross slide and moves past the saw for use in cutting off and for dado work. The cross slide is gibbed to main table frame and can be drawn 4 in. away from the saw line so dado heads and grooving saws may be used. The stationary section of the table is graduated its entire width in eighths and the sliding section is graduated into degrees.



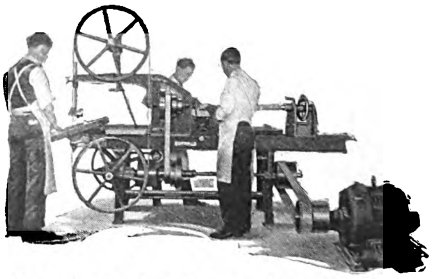
Two crucible steel machine ground arbors fitted into bearings are lined with interchangeable sleeves having oil wells and wick conveyors that keep them flooded with oil continuously. The arbor pulleys are of the pneumatic type, machined and balanced.

The universal ripping fence may be used on either side of the saw or secured at any angle not in line with the saw, on either the stationary or the rolling table. It has a quick adjustment of 12 in. without changing the locating pins to the next set of holes. A micrometer will set the bench to and from the saw for fine and extremely accurate adjustment. It has a parallel adjustment whereby it may be set to or from the operator 9 in. A miter and cut-off gage on the sliding table swings to an angle of 30 to 135 deg. It has 18-in. and 36-in. auxiliary rods and stops for determining lengths to cut off. Two universal gages are supplied for the table grooves each side of the saw. They are graduated from 30 to 150 deg. The machine has a capacity to rip 22 in. wide, cut off 34 in. wide up to $1\frac{1}{2}$ in. thick. The 14-in. saw projects through the table 4 in. The machine with motor brackets occupies a floor space of 4 ft. 1 in. x 5 ft. 6 in.

Complete Woodworker

BUFFALO FORGE COMPANY
Buffalo, N. Y.

TEN machines in one is the manufacturer's description of the woodworking machine shown. It includes a rip and cross cut saw, a band saw, a planer, jointer, shaper or edge molder, a lathe, a drill and a sander. A grinder can be furnished at extra cost. Three men can work on it at one time without interference with one another. Practically any woodworking operation can be performed.



Tight and loose pulleys are provided on the main shaft at the left of the cone pulleys, below the table. This construction makes it possible to run the belt up through the table to a lineshaft or motor overhead. There are three distinct parts to the machine, which may be operated together or individually. One is a lathe which is used also for drilling and grinding. The second is the band saw, and the third the arbor used for circular saw, planer, sander, jointer and shaper. These main parts are engaged by three conveniently arranged clutches. The main driver is provided with a belt shifter which can be operated from either side of the machine. With all parts of the woodworker operating at the same time only 4 hp. to 5 hp. is required.

An adjustable mandrel furnished can be run horizontally or vertically and on it may be inserted planer and dado heads and circular saws or knives of any size. It is made of cold rolled steel and carefully machined. A planer table is made in two parts which fit into the channel on the main table. An adjustable guide for the planer is furnished which can be set at a 90-deg. angle with the table top or tilted back to allow planing at an angle. The planer slides are 29x10 in. and 21x10 in., respectively. By raising the mandrel to a vertical position a shaper is obtained on which any kind of knives may be used. Rip and cut-off saws of 12 in. diameter are furnished with the machine. Cuts of any size or desired depth up to 3½ in. may be made. The removable gage for cross-cutting has a quadrant which permits adjustment for sawing at any angle from 30 deg. to 90 deg. The lathe will handle work up to 20 in. diameter by 40 in. long. Four step cone pulleys, of 5½, 7½, 9¾ and 12 in. diameter respectively, are an essential part of the lathe. A clutch is provided on the lower cone pulleys. A band saw table is cast in one piece with the main table. It measures 29½ by 30 in. The saw wheels are 27 in. in diameter and the maximum clearance below the guide is 15 in. A ½-in. band saw is furnished with the machine. The band saw is as strongly constructed as it would be in an individual machine, the shaft diameter is 1⅜ in. and the upper bearing is 10 in. long.

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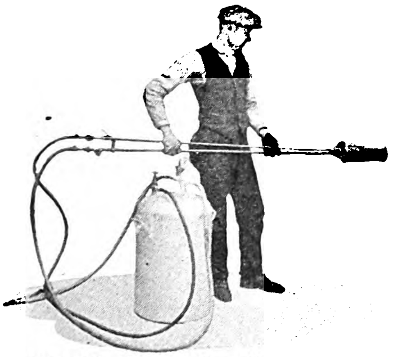
Track Maintenance Tools

Oil Preheater

ALEXANDER MILBURN COMPANY
1416-1428 West Baltimore Street,
Baltimore, Md.

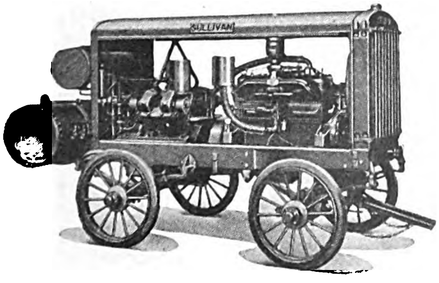
CASTINGS can be heated prior to welding, tar kettles can be heated, pipe can be thawed, etc., with the Milburn preheater. The oil burner is of the atomizing type, utilizing crude, fuel, kerosene oil or distillates, and compressed air varying from 50 to 100 lb. pressure. The tank is constructed of heavy gage steel and the bottom is welded. Two handles welded to the tank facilitate handling. The weight of the unit is 60 lb. The outfit consists of a 5, 12 or 22-gal. reservoir, an atomizing burner, 25 ft. of air hose with couplings, 25 ft. of special composition oil hose with couplings, oil pipe feed line, air pipe feed line and suitable valves for air regulation.



Portable Air Compressor

SULLIVAN MACHINERY COMPANY
122 South Michigan Avenue, Chicago, Ill.

COMPRESSED air is supplied at the rate of 220 cu.ft. per minute by the four-cylinder V-type compressor shown, which is direct connected to a Buda engine. The parts, together with an air receiver, gasoline fuel tank and radiator, are mounted on a steel frame with sheet steel canopy top and removable side covers. The wheels and truck are a matter of selection. All compressors in the line are single acting and employ a Sullivan "wafer valve." They are automatically lubricated and have water-cooled cylinders, barrels and heads. The flywheel and crankshaft assembly are carefully balanced on a special machine. The compressor is said to be a new departure in design, the V-type arrangement of cylinders adopted entirely eliminating vibration and decreasing the weight. Each of the four cylinders is 6½ in. x 5¼ in.

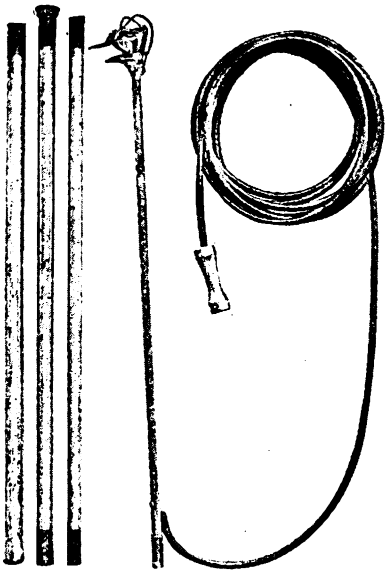


The Buda engines are four-cylinder machines provided with four-point suspension. They can be equipped to use kerosene instead of gasoline if desired.

Contact Hook and Pole

RAILWAY TRACK-WORK COMPANY
Clementine, Thompson and Mercer Streets,
Philadelphia, Pa.

PIVOTED jaws 5 and 6 in. long, of special composition, grooved to grip the trolley wire above and below are features of the Ajax contact hook and pole. The weight of the pole clamps the jaws on the wire. The lower jaw comes in contact with the clean under-surface of the trolley wire, preventing arcing and burning. When in position on the trolley wire, cars can pass without removing the pole. When the pole is raised, the lower jaw drops behind the guide lug, so that the upper jaw slips on the trolley wire into position for clamping. The lower end of the pole can be rested in any convenient position to clear passing cars. The contact will handle 300 amp. without injury to the wire.

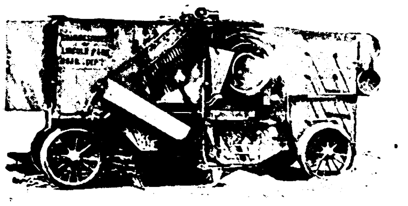


Chausse Model E-3 Portable Asphalt Repair Plant

CHAUSSE OIL BURNER COMPANY
West Beardsley Avenue, Elkhardt, Ind.

MODEL E-3 asphalt repair plant is an improved development of the model E-1 and E-2 machines. It permits of laying hot asphalt and is suitable for large or small patchings or for supplementing stationary plants. The machine may be used as an independent unit directly where the repair work is being done as it is self-propelled on rubber-tired wheels and contains ample storage for raw material.

The plant is equipped with a Continental motor, small Kellogg air compressor for fuel-line pressure, S.K.F. ball bearings on the sand drier, high-pressure lubricators on all other bearings, Cotta transmission, twin disk clutch, Geneva wheels and standard solid rubber tires.

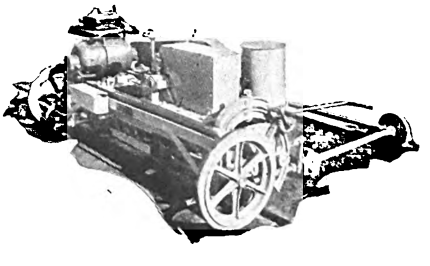


The capacity of the plant is rated at 150 sq.yd. of 2-in. compacted mix per eight-hour day. Old asphalt can also be reclaimed during regular operations. A tool heater with an oil furnace is located at the rear of the machine. Bins provide for the storage of 135 gal. of asphalt, 2¼ cu.yd. of mineral aggregate, 1,750 lb. of cement or lime dust, 50 gal. of kerosene and 9 gal. of gasoline. The light weight of the machine is 9,400 lb.

Rail Joint Grinder

RAILWAY TRACK-WORK COMPANY
Clementine, Thompson and Mercer Streets,
Philadelphia, Pa.

BLOCKS of abrasive material 10 in. x 4 in. x 2½ in. with a steel pin inserted in one end are used in this machine. Two blocks are used in one setting of the machine, providing a grinding surface of 8½ in. x 2½ in. The blocks are placed endwise in the crosshead or brick holder which slides bodily in guides. It is reciprocated over the rail by means of a simple rocker arm movement at a speed of 340 strokes a minute. As the blocks wear, the end wedge is slackened by turning the small hand wheel over it, while the blocks are fed downward by means of the large hand wheel operating the feed screw directly over the blocks. With the long straight grinding surfaces it is impossible to grind the low spots. A 3-hp., 600-volt direct-

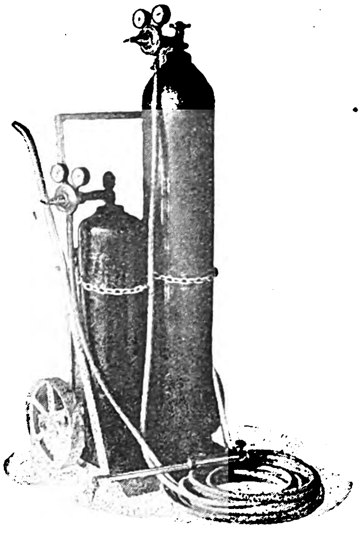


current constant-speed motor is used for driving the grinder. Turning the hand crank at the right of the machine lowers the derail wheels to the pavement and raises the grinder from the track, supporting 95 per cent of the weight so that the operator can lift the outrigger end of the machine and roll it off the track. The grinder weighs 1,350 lb. complete. The outrigger is hinged so that it can be raised vertically for storage or transportation.

Portable Oxyacetylene Plant

ALEXANDER MILBURN COMPANY
1416-1428 West Baltimore Street,
Baltimore, Md.

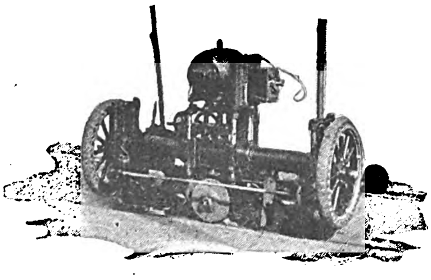
WELDING, cutting or a combination of the two can be done with the Milburn portable oxyacetylene plant. The truck is made to accommodate the small or large sized oxygen or acetylene tanks. The truck illustrated is constructed of heavy steel angles bent and strongly welded to withstand rough usage. The diameter of the wheels is 16 in. A strong chain welded to the frame of the truck holds the cylinders in place so that there is no danger that they will slip when in transit.



Automatic Rotary Track Grinder

RAILWAY TRACK-WORK COMPANY
Clementine, Thompson and Mercer Streets,
Philadelphia, Pa.

ROTARY track grinders of the type shown are automatic in travel. The motor and grinding carriage are mounted in the center of the machine, which travels along the track at a speed of 30 in. per minute when grinding. Its movement can be reversed for any length of travel. By means of a clutch operated by a hand lever the speed is increased to 100 ft. per minute for moving the machine from one joint to the next. Two shoes 16 in. long are attached to the frame on which the machine rests. The shoes have openings through which the track wheels extend. By means of a heavy spring over each wheel, any tension can be applied so as to distribute the weight equally over the shoes and track wheels.



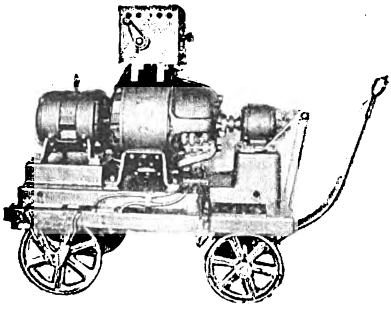
The machine is controlled from the operator's seat. Within his reach is a handwheel for feeding and one for tilting the grinding wheel, a hand lever for instantly or gradually raising the grinding wheel to obtain a run-off on the rail head and also the lever to control the lateral adjustment of the grinding wheel. The long lever shown at the left of the machine is for raising the machine from the track to the two roadway wheels to allow cars to pass.

A substantial silent chain drives the wheel arbor direct from a 5-hp. motor. The machine accommodates grinding wheels 14 in. in diameter by 2½ in. or 3 in. face. The grinding wheel arbor is operated on ball bearings with dust-proof caps. The outrigger is hinged for raising when transferring the machine or transporting it on a truck.

Single Operator Arc Welding Equipment

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.

PORTABLE 200-amp. single operator welding equipment as shown is an entirely self-contained unit. The control of the welding current is simplified so that only one handle rotating through 360 deg. is required for adjustments. The apparatus is mounted on a truck and the sturdiness of the various parts insures against breakage and accident on account of rough handling to which such apparatus is usually subjected. The generator will deliver 200 amp. at 25 volts to a resistance load for one hour with a temperature rise not to exceed 50 deg. C. Its continuous rating is 93 per cent of its one-hour rating with the same temperature rise and the same voltage. It will deliver 275 and 300 amp. at the arc for welding duty. The generator operates at arc voltage and no external resistance is required in the circuit. The generator is designed to stabilize the arc inherently, thereby eliminating the necessity for automatic moving devices such as relays, solenoid-controlled resistors, etc. Either a direct-current motor or an alternating-current motor may be used, depending on the characteristics of the supply circuit. The driving motor and the generator are mounted on a common shaft and bed plate. To eliminate bearing and shaft troubles the exciter is coupled to the common shaft by means of a special flexible coupling and is supported by an extension of the common bed plate. Ball bearings of the radial type are used throughout, which allows the equipment to be operated in any location without danger of oil spilling and without the necessity for exact leveling. The complete control equipment for starting and regulating the current output is contained in a steel cabinet mounted on top of the generator. This company also manufactures arc welding rheostats for railway use as well as multiple operator equipment for manufacturing plants.



Electric Arc Welder

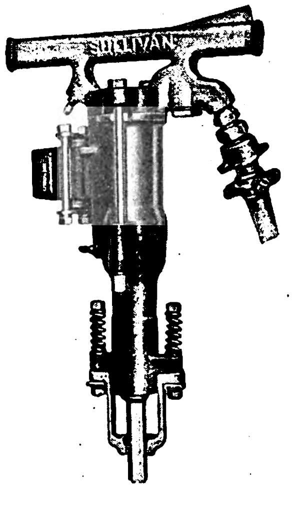
RAILWAY TRACK-WORK COMPANY
Clementine, Thompson and Mercer Streets,
Philadelphia, Pa.

COILS of a high resistance wire, supported by insulator bars, which in turn are carried by a light but sturdy steel angle frame, form the essentials of this arc welder. At one end of the frame is mounted a switchboard to control the current. The unit is light and portable, having large capacity with ample ventilation and accessible parts. The Ajax welding machine type RWY weighs approximately 120 lb. It is 18 in. x 28 in. x 36 in. The type IND machine weighs approximately 55 lb. Its size is 15 in. x 20 in. x 25 in. The hinged handles for carrying the machine drop parallel to the corner posts when released. Regulating switches provide a range of current from 19 to 333 amp. under normal line voltage with intermediate steps of 18 amp. each. If the line voltage drops to as low as 300 volts, 209 amp. can be obtained. It is claimed that the resistance wire used will not oxidize. A shunt switching device controls the several groups of coils independently, whether the full length of the coils is in operation or they are shunted. By means of the switchboard, 36 different values of current can be obtained. A sheet steel truck mounted on four rubber-tired ball-bearing wheels can be furnished if desired. This truck has compartments in the bottom for carrying a supply of welding rods and a box in the front for accessories.

Heavy-Duty "Busters" for Breaking Concrete

SULLIVAN MACHINERY COMPANY
122 South Michigan Avenue, Chicago, Ill.

SULLIVAN "Busters" are designed to meet the wide and increasing demand for a one-man compressed air tool to do quickly and cheaply such work as breaking up concrete, cutting asphalt, excavating frozen ground in trenches, etc. The DW-221 type weighs 75 lb., is economical of air and runs with little vibration. It uses a 1⅛-in. steel with plain hexagonal collar shank and requires a ¾-in. air hose connection. Characteristic features are the valves and piston motion, automatic differential pressure lubricator, inclosed dust-proof chuck, steel retainer, all-steel construction, light-weight, rapid action, positive control of the piston and the hard powerful snappy blow in parts through the piston. The valve mechanism is secured in the chest by side rods, and the valve buffers are made of heat-treated tool steel to resist shock and breakage. The pistons are made from bar stock of alloy steel and ground to fit the cylinders, which are solid drop forgings. The chuck and chuck bushing are inclosed in a dust-proof housing. Ample lubricating ports are provided in addition to the automatic lubrication incorporated in the machine.

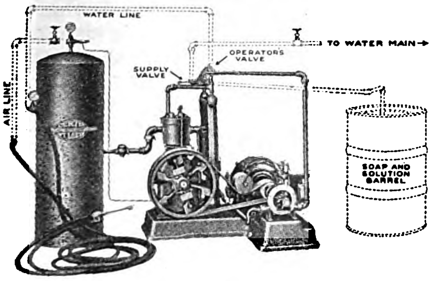


Bus Repair Equipment

Car Washing System

CURTIS PNEUMATIC MACHINERY COMPANY
St. Louis, Mo.

THE Curtis air-mist car washing system is furnished with a 4½-in. x 4½-in. water-cooled compressor belt connected to a 5-hp. motor. The self-contained compressor is fully inclosed to protect the working parts from dust and dirt. The crankshafts and connecting rods are made from steel forgings. The cylinder head and valves are water cooled and a radiator of suitable proportions is provided. The valves are of the light disk type, tempered, ground and polished. The valves seat on a phosphor bronze flat seat of a large area and can be removed independently without taking off the cylinder heads or loosening the pipe connections or fittings. An air pressure governor is part of the equipment. When the maximum pressure in the tank is reached the governor unseats a suction valve and the compressor runs idle until the tank pressure has dropped 5 or 10 lb. A centrifugal unloader prevents the motor from being started under load. The oil in the crankcase is picked up by knife blade throwers on the crankshaft.



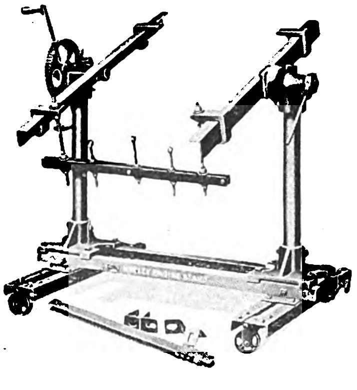
The equipment furnishes a full force spray for washing the undersides of fenders and chassis and a soft or mild spray for washing the body. The adjustment is made by turning the operating valve. A third position of this valve will shut off the water. A supply valve permits of the withdrawal of water from a barrel or tank or from the regular water service line as desired.

The equipment shown is furnished in only the one nozzle type. The whole unit, including the air tank, can be installed in a floor space of 3 ft. x 7 ft.

Universal Motor Stand

MANLEY MANUFACTURING COMPANY
York, Pa.

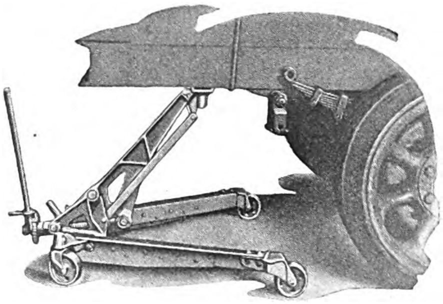
GASOLINE motors placed on the stand shown can be turned by one man into any convenient position to facilitate his work. The three-point suspension bar, of which two are furnished with the stand, is an important improvement. These suspension bars make it easy to mount and balance practically all types of three-point suspension motors. In addition to this a set of brackets slide on the side members for ready mounting of four-point suspension motors. A cone clutch installed on the top of the upright permits of locking the side rails to any desired position.



High-Lift Jack

WEAVER MANUFACTURING COMPANY
Springfield, Ill.

UNUSUAL range of lift is found in a sturdy, dependable jack designed with increased capacity for handling buses and trucks. This jack incorporates all of the good features which made the previous models popular, as well as many new ones. The lifting arm, of the screw hoist type, is raised and lowered by a traveling nut attached to the end of the arm. The handle operates a wheel on the end of the shaft through a ratchet and dog. It has a capacity of 8,000 lb. and a lifting range of 40½ in. The screw extension permits a lift to be applied directly to the chassis frame in spite of low running board or gas tank. Accidental release of the load is impossible due to a special locking mechanism. A broad wheelbase prevents tipping.



Power Tire Spreader

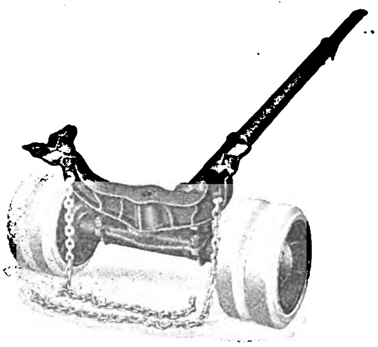
WEAVER MANUFACTURING COMPANY
Springfield, Ill.

QUICKER and easier means for spreading pneumatic tires up to 10½ in. for inspection and repairs without danger of injuring them is possible by use of the machine shown. A feature is the method of spreading the tire naturally over the convex buffing plates with an outward and downward motion without subjecting the tread to any undue strain. Operation of the spreader by compressed air permits the repairman to devote his entire attention to the inspection of the tire. The device does not have to be bolted to the floor, since it is designed to support the largest and heaviest tires without the possibility of being overbalanced. Shipping weight of the spreader is 253 lb. and it occupies a floor space of 15 in. x 26 in.

Truck Ambulance

WEAVER MANUFACTURING COMPANY
Springfield, Ill.

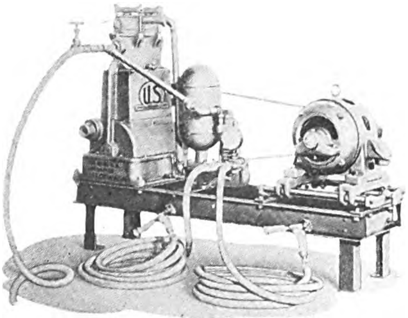
PROVISION for quicker, easier and safer pulling of disabled buses and trucks is given as the reason for the design of the truck shown. The load is supported by a 2½-in. high-carbon-steel axle held to the frame by two heavy U-bolts. The wheels are supported on the axle by dustproof ball bearings which take the radial weight of the load and the thrust strain. Heavy double tires mounted on 16-in. diameter wheels 8½ in. wide insure strength as well as lack of vibration and noise when towing. The cast-steel yoke which supports the load turns on a pivot, permitting guidance by the tongue. Interchangeability of saddles permits of center variation from 19¼ in. to 28¾ in. This truck can be readily attached to rear or front axle. The pole is of telescoping design and its length can be adjusted from 7 to 13 ft.



High-Pressure Washing Machine

UNITED STATES AIR COMPRESSOR COMPANY
Cleveland, Ohio

SEVERAL models of this washing machine are built. The one shown is a two-gun unit. Other models developed are the AW-Jr., which is a one-gun machine, and the AW-4, a four-gun machine. The equipment is capable of increasing the normal city water pressure of about 40 lb. to more than 300 lb. continuous pressure with the gun wide open. It is said that this pressure will remove the most stubborn caked grease and crusted dirt. By a slight turn of the valve on the special U. S. pistol grip gun a soft, penetrating mist can be obtained for soaking and washing the body. A feature of these units is the fact that they can be connected directly to the city water supply line for both hot and cold water without danger of the high pressure backing up into the plumbing system and causing damage. This is made possible by a vacuum breaker valve supplied with the equipment. A double suction connection permits drawing a soap solution from a barrel or tank if desired. The pump of this machine is totally inclosed and all moving parts are continually bathed in oil.

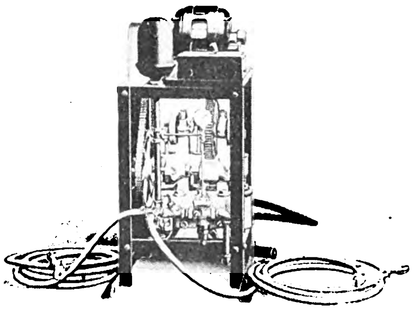


Two-Gun Auto Washer

MANLEY MANUFACTURING COMPANY
York, Pa.

IN BUILDING the machine shown the Worthington Triplex pump was selected as most suitable. This pump has three cylinders 120 deg. apart on the crankshaft so the flow of water is continuous with a maximum pressure. The pump has a single casting and no cup washers or leather buckets are used. The valves are bronze, wing guided in a vertical position on bronze seats. The crankshaft of the pump is drop forged, having babbitt connecting rods with cap screw connections for taking up the wear. The pump is driven by a silent chain from the motor on the top of the steel framework. Suitable sheet steel guards over the chain and gear protect them from water.

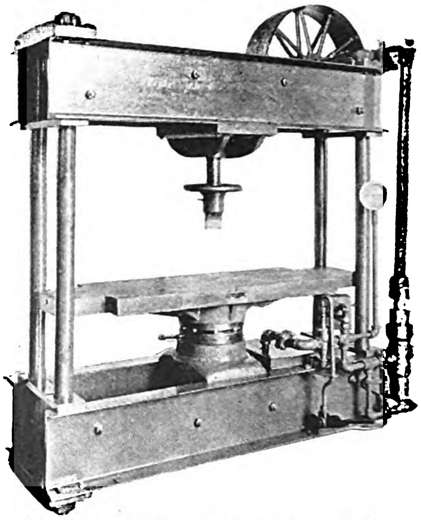
The unit is vertical with the motor at the top, so that it occupies small floor space. The reduction gear is of extremely wide face, coarse pitch and machined cut teeth. A feature is an automatic control valve furnished with the machine. It unloads the pump as soon as the system is up to pressure. This adds life to the pump and reduces the energy consumption. If for any reason the machine is overloaded, the safety valve discharges the water and relieves the machine of strain. The suction line contains a three-way valve so that city water can be pumped, or when thrown in another position the suction hose can be used in connection with a barrel of soap solution, etc. Automatic ring oilers are used on the motor, whereas all other parts of the pump are lubricated by the alemite system. The guns can be adjusted from a fine mist to a hard stream of any volume. The height over all is 46 in. The floor space occupied is 24x30 in. The size of the water fitting is ¾ in. The washer is furnished complete with triplex pump, safety guards, silent chain drive, 6 ft. of suction hose, two 25-ft. lengths of pressure hose, two guns, automatic pressure control, pressure gage and motor.



Hydraulic Straightening Press

LOURIE MANUFACTURING COMPANY
Springfield, Ill.

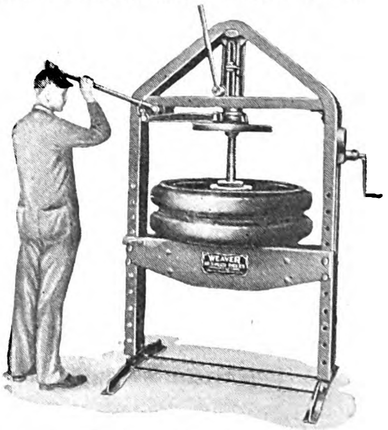
STRUCTURAL steel construction is used in this press for straightening such parts as automobile axles, crankshafts and camshafts. It is furnished with one differential piston pump, which gives a rapid movement of the ram under low pressure and automatically slows down under heavy pressure. One additional piston can be furnished if desired which will give double the ram speed. It is operated by pedal control valve, which permits the operator to have free use of both hands. The machine shown occupies a floor space of 16 in. x 60 in.



60-Ton High-Speed Press

WEAVER MANUFACTURING COMPANY
Springfield, Ill.

MORE powerful, quicker and more easily operated, and said to be capable of handling any job, is this 60-ton press. The ball-bearing construction, combined with the steep pitch screw, insures greater power and speed with less effort. These are considered outstanding features. It affords two distinct leverages for light or heavy work, either of which can be used without changing the position of the work. Three leverages are available for heavy pressure. The safety bolster is easily raised or lowered by a crank to bring the work in direct contact with the screw. Vertical operation of the lever makes it unnecessary to bolt the press to the floor.



Association News & Discussions

Motor Coach Maintenance*

Proper Layout for the Garage Is Important to Obtain Greatest Efficiency from Shop Forces—Tool Equipment Need Not Be Elaborate but Should Be Chosen to Meet Requirements

By H. P. McDonald
Superintendent of Automotive Equipment
East St. Louis & Suburban Railway, East St. Louis, Ill.

How large should an operator build his garage? Based on experience, the width should be not less than 100 ft. and the length, of course, would depend on the present size of the fleet and the probable future purchases of additional coaches. In using a minimum width of 100 ft., I am going on the basis that the garage, when built, will have no obstructions, such as columns or posts. This width permits coaches to be backed in along each side wall so as to leave an aisle in the center. Any particular coach can then be pulled out without having to move four or five other coaches. When the fleet is so large that center aisle storage becomes necessary, the 100-ft. minimum width still permits the greatest economic use of space. Coaches that are first out in the morning should be the ones stored in the aisles. In storing coaches along the side walls, the distance between coaches should be not less than 12 in., with 2-ft. wall clearance at the rear. This space provides proper access to night men to grease and clean the vehicles properly.

The last two items are very essential because a sanitary and clean coach attracts passengers and the ultimate achievement of low operating cost cannot be secured unless there is proper lubrication. The spacing also provides ample room for extinguishing possible fires.

In these days of rapidly changing conditions, a ceiling or truss height of 16 ft. should be a minimum. This gives plenty of ventilation and also provides for possible future purchase of double-deck equipment. Low-cost constructed garages are dangerous, as carbon monoxide gas causes men working on coaches to develop serious headaches.

Wash Rack Location Important

The wash rack should be located just inside the main entrance door, its length depending upon the size of the fleet. The gas and oil pumps should be located at the inner end of this rack. This enables the largest part of the night's program to be completed at this point and all operations can be observed closely. Coaches coming in off their runs go over the wash rack for cleaning, then are filled with gas, oil and water, and, if not due for any inspection, would be immediately stored along the sides. If due for inspection, they would take their turn in going over the pits. Alongside the wash rack small pits should be provided in the floor, in which water hose and nozzles can be kept ready for use. The number of inspection pits depends upon the mileage of fleet over a 30-day period and the mileage basis adopted for periodical inspection. The tool room, stock room, and work benches should be located as near the pits as practicable, in order to save time in obtaining supplies. Plenty of room should be left between the work benches and the edges of the pits so that floor cranes for handling engines and other heavy apparatus can be readily used.

Motor coaches of today are being built lower and lower and there may be some possibility of making them still lower. Pits, therefore, are a necessity to speed up the work that has to be done underneath a motor coach. They enable the men to use their full efforts in the maintenance of the coaches. The pits should be well lighted and ventilated and should have a sewer connection so that they can be washed out occasionally and kept in a sanitary condition. The size of the pits will vary with the size of the vehicle, but their length should be such that any unit on the chassis can be inspected and serviced readily. Ample general illumination by means of ceiling lights should be provided, and there should also be frequent drop or portable light wall connection sockets. Of the latter at least two should be on each side of each pit and they should also be located not more than 20 ft. apart along all sides of the garage.

There are several methods of heating garages. Based on experience, it appears the use of radiators along the walls is the best. This enables you, in cold weather, to head your coaches in toward the wall so that the engines are close to the radiators and thus kept warm. This makes starting easier, keeps the oil at proper temperature and enables it to function when the engine is started, thus ultimately reducing maintenance costs.

Training of Drivers

In order to have low maintenance cost, drivers must be properly instructed and trained. They must first be impressed with the fact that motor coaches are to be operated primarily for the comfort and convenience of the passengers. They should be started easily and smoothly and stops should be made in the same manner. While this provides comfort and convenience to passengers, it also, in the end, results in lower maintenance cost and less abuse of equipment. Drivers should be instructed to check oil and gas on leaving the garage and to make two or three checks during their day's run and, when they are relieved on the road, the relief crew should be instructed to do the same. This prevents running out of gas on the road, which may cause loss of patronage, due to irritation of passengers, and also prevents oil getting low, which may completely ruin a motor in a short time.

Drivers should also be impressed with the importance of reporting any and all unfamiliar noises which may develop during a day's run, and where obvious defects occur they should be required to report them on proper forms when they turn in to the maintenance department. We quite often find defective motor coaches sent out on the road just because drivers have failed to make the necessary reports so that the mechanical department can make repairs. Proper operation of motor coaches with low maintenance cost is just as much the business of the transportation department as it is of the mechanical department, and unless

COMING MEETINGS
OF
Electric Railway and Allied Associations

March 24—New England Street Railway Club, annual meeting and banquet, Copley-Plaza Hotel, Boston, Mass.

April 1—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

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*Abstract of paper presented at the Illinois Electric Railway Association convention, Springfield, Ill., March 17-18.

there is close co-operation between these departments proper maintenance with consequent increase in reliability cannot be secured.

Good Lubrication Essential

Maintenance on high-class automotive equipment can be conservatively stated to consist of 90 per cent lubrication and 10 per cent adjustment and replacement. If the lubrication is neglected the necessity for adjustments and replacement will increase all out of proportion to the lack of proper lubrication because, taking into account the quantities used, the highest priced lubrication is vastly cheaper than labor and repair parts. When the maintenance department realizes that the cost of lubrication represents a very small percentage of the total operating cost, the reliability of the coaches under their charge will increase and the cost of maintenance decrease.

Only the highest grade of lubricants should be used. In my opinion, there is no standard by which it may be gaged by laymen. Buying automotive oil on specifications doesn't mean anything, as we find several oils have the same flash, fire, viscosity and specific gravity tests and yet they may have different lubricating qualities. Therefore, the safest plan is to buy your oil from a reliable firm with an excellent standing in the industry and, within reason, accept the recommendation of that firm as to the grade and type of lubricant best suited to your needs.

General overhauling instruction sheets should be supplied so as to give the men a definite list of the work to be done. In our case printed instructions are placed on the left side and all gas and oil averages next to them; then the list of the mechanical defects that are reported from one inspection to another shows which of the various units on the coach have given the most trouble and need special attention. The record of gas and oil averages show readily the condition of the engine. The operator should analyze defects carefully that come up and if a particular type of defect recurs, he should notify the manufacturer so that a remedy can be found and applied in future production. In this manner all future purchasers of the particular type of coach equipment are benefited.

The printed instructions on the general overhaul sheets should be divided into different classes of work and in this way it is possible to develop the ordinary type of man into a valuable worker. Men can be developed from the ranks and promotion made from one grade to another, as performing these various operations day by day develops where an operator has an assortment of equipment. These instructions should be made to cover operations on all makes of coaches. Training of mechanics to do efficient work is a serious problem and the cost is great. Care should be used in selecting these men so that the turnover will be at a minimum.

Electrical work should not be tampered with by the ordinary mechanic. An automotive electrician should be the only man to look after electrical units, with the exception, of course, of changing lamp bulbs or changing an entire generator or magneto unit.

Provision of sufficient tools, blocks, jacks, etc., and satisfactory working conditions should be given careful consideration. In our case, we personally give shop men ten minutes in the morning at 10 o'clock and in the afternoon at 3 o'clock in the hot summer months for a smoke and recess. Of course, any smoking done around the garage is done on the outside and not inside the building. We feel that by doing this, it freshens up the men and causes a friendlier feeling toward the company and the departmental head in charge. Lockers, ample washroom facilities and a place for the men to eat their lunches should be provided.

Few Machine Tools Needed

Men engaged in general overhaul operation do not require many machine tools, as the system does not call for actual repair of the units. It mainly consists of complete lubrication, complete adjustments and replacements of such units as are necessary. A drill press, bench grinder and arbor press are about all that are needed, and these only in emergency cases. We do not approve of furnishing mechanics with ordinary tools, such as wrenches, pliers, hammers and screw drivers as our experience has been that they are careless with company tools and let them lie around so that when they do need them they have to spend time to find the particular tool or wrench they want. If each mechanic is required to furnish his own tools of this character, he will not, as a rule, let them lie around and lose them. Large tools and other necessary shop tools should be furnished by the company and passed out on a check system, which makes the man taking it out responsible. Ample spare units should be kept on hand to speed up general overhauling work, so that the coach will not be tied up for a considerable length of time in order that the unit may be repaired.

Units which have been removed under general overhaul operations should be repaired in a special department, which gives better efficiency and enables the man in charge to hold the men working on those units responsible for improper repairs. Each unit should be numbered and a change slip made out when a unit is changed. A record should be kept of change slips and the reasons for such changes, so that when a particular defect shows up continually the cause of the defect can be analyzed and remedied. Except in emergencies temporary repairs should be avoided, as these are merely a makeshift and are apt to cause trouble and expense later. All major repairs should be made by the day force, leaving for the night force the running defects that are written up by the coach drivers on report cards. The latter usually consists of inspecting fan belts, setting up spark plugs, and checking up on brakes, etc. If the small defects are handled thoroughly at night, it will be found that road calls and involuntary stops will be materially decreased, as experience shows that road calls in general can be divided approximately 90 per cent to neglect, 5 per cent for flat tires and 5 per cent for defective materials and causes beyond control.

The success of motor coach operation depends on the thoroughness of the general overhaul or inspection, which must be done thoroughly in order to keep the vehicle at as near 100 per cent condition as is practical at all times. General overhauls or inspections should be carried out at such periods of from, say, 2,500 to 4,000 miles, in order to give satisfaction. In our opinion, 3,000 miles is the proper figure. If some program, such as the above, is not carried out, it will cause delays on the road, with consequent disruption of schedules and cause the public to lose confidence and stop riding, so that it may take months to get them back as customers. The man in charge of maintenance is held responsible for the mechanical condition of the coaches and if the transportation department does not allow him to keep the coaches over pits long enough to give them full inspection, best results cannot be secured. It must be remembered that a motor coach of proved merit costs from $8,000 to $12,000, and if it is not properly maintained its life will be short and the owner suffer a loss.

American Association News

Subjects and Meetings

MEMBERSHIP of the committee on subjects and meetings of the American Association has just been announced by President Sawyer. The complete personnel follows:

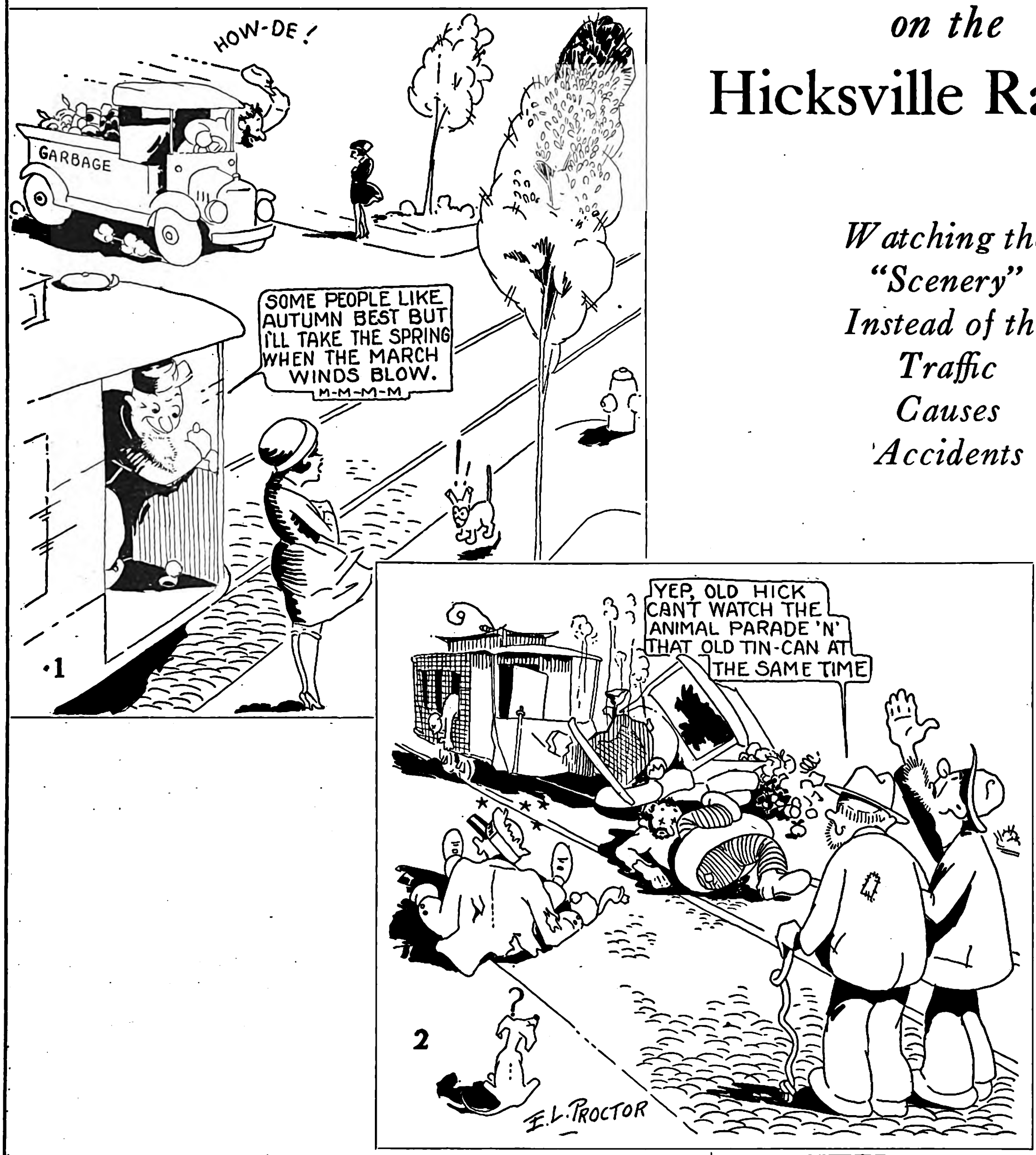
Harry L. Brown, secretary Ohio Brass Company, Mansfield, Ohio, chairman.

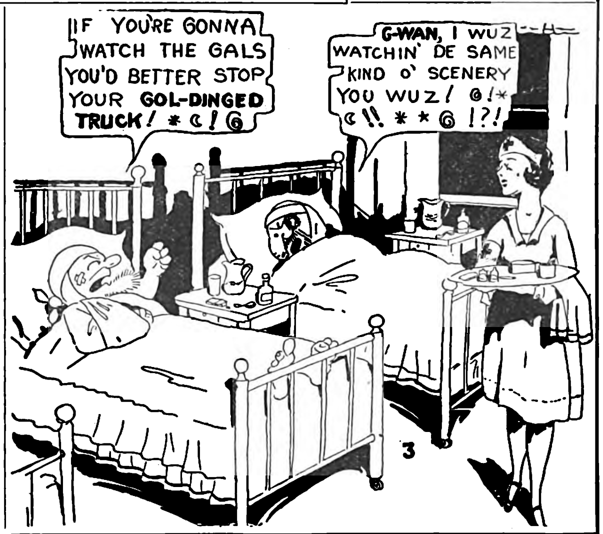
Edward Dana, general manager Boston Elevated Railway, Boston, Mass., vice-chairman.

James P. Barnes, Louisville, Ky.
F. G. Buffe, Kansas City, Mo.
F. L. Butler, Atlanta, Ga.
H. C. Clark, Newark, N. J.
Thomas Conway, Jr., Philadelphia, Pa.
L. J. DeLamarter, Grand Rapids, Mich.
F. W. Doolittle, New York, N. Y.
W. A. Draper, Cincinnati, Ohio.
R. W. Emerson, Cleveland, Ohio.
Thomas Fitzgerald, Pittsburgh, Pa.
J. R. Fitzpatrick, Chicago, Ill.
George Frey, Philadelphia, Pa.
Charles Gordon, New York, N. Y.
D. W. Harvey, Toronto, Ont., Canada.
W. W. Holden, San Antonio, Tex.
M. B. Lambert, New York, N. Y.
W. H. Lines, Portland, Ore.
E. B. Meissner, St. Louis, Mo.
Dudley Montgomery, Madison, Wis.
C. E. Morgan, Brooklyn, N. Y.
A. T. Perkins, St. Louis, Mo.
J. S. Pevear, Birmingham, Ala.
H. B. Potter, Baltimore, Md.
J. K. Punderford, New Haven, Conn.
G. A. Richardson, Chicago, Ill.
H. S. Robertson, Denver, Col.
E. J. Speh, Cleveland, Ohio.
E. P. Waller, Schenectady, N. Y.
E. A. West, Salt Lake City, Utah.
H. R. Whitney, Worcester, Mass.

Adventures of Old Man Trouble *on the* Hicksville Railway

Watching the "Scenery" Instead of the Traffic Causes Accidents


HOW-DE!
GARBAGE
SOME PEOPLE LIKE AUTUMN BEST BUT I'LL TAKE THE SPRING WHEN THE MARCH WINDS BLOW. M-M-M-M
1
YEP, OLD HICK CAN'T WATCH THE ANIMAL PARADE 'N' THAT OLD TIN-CAN AT THE SAME TIME
2
E. L. PROCTOR


IF YOU'RE GONNA WATCH THE GALS YOU'D BETTER STOP YOUR GOL-DINGED TRUCK! *☾!@
G-WAN, I WUZ WATCHIN' DE SAME KIND O' SCENERY YOU WUZ! @!* ☾!! * * @ !?!
3

Accidents are avoided by assuming that the other fellow is going to be careless. Keep your eyes and mind on the traffic. The greatest asset a street railway has is an employee who guards the safety of those intrusted to his care and lets the "scenery" go by without distracting his attention from essential duties.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page free of charge for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. ZIMMERMAN AND E. L. PROCTOR

The News of the Industry

One-Man Car Case Decided

Iowa Supreme Court Refuses to Enjoin Union from Enforcing Two-Man Car Requirement.

All hope of instituting one-man car service as an economy measure by the Des Moines City Railway, Des Moines, Iowa, appears to have been banished in an opinion handed down on March 15 by the Iowa Supreme Court affirming Judge Joseph Meyer of the Polk County District Court and refusing to enjoin Local 441 of the Amalgamated Association from enforcing a 25-year contract calling for the operation of street cars by a motorman and a conductor.

COURT QUOTES WORDING OF THE 1916 FRANCHISE

The high court failed to rule directly upon the contention of the company that the contract was against public policy in that it prevented the introduction of economies which would, if instituted, result in the reduction of fares to the residents of Des Moines. The court disposed of this question by pointing out that the franchise ordinance of 1916 contains the provision that "in the operation of its railway by electricity each motor passenger car shall be in control of a motorman and a conductor."

This is practically the wording of the contract between the company and the association, the opinion states, and goes on to say that, "so long as this ordinance of the city of Des Moines exists all parties are bound thereby, and there is no ground for equitable intervention."

In a similar manner the court refused to assume jurisdiction in the question raised by the company over the validity of the check-off. The opinion says:

> The company has a clear, speedy and adequate remedy at law for the very thing about which it complains. It is true that the evidence shows that certain of the employees did so notify the company (to refuse to pay the check-off of officers of local 441), but such employees are not specifically named as defendants herein.

On the third main point raised by the company, which alleged that the contract was "invalid because it was in violation of the constitution and by-laws of the International Association," the court held that this was a matter wholly between the local and the international. On this point the ruling said:

> So long as no complaint is being made by the international against the local for non-compliance, it does not lie with third parties to raise such a question.

MATTER OF PUBLIC POLICY DISCUSSED

The company's charge that the contract has the effect of unionizing an entire industry and is therefore against public policy brought forth the comment from the court that "if it is true that the contract contravenes public policy, as between the parties thereto, both are *part delecto*, or, in other words, both are equally at fault."

The contract which the traction company sought to enjoin the union from enforcing was signed in 1915 and has thirteen years to run. The company has been operating under a 10-cent cash fare and selling weekly passes at $1.25, but has shown monthly deficits regularly for nearly a year with the exception of December, 1926, and January, 1927. The debit to the stabilizing fund as of Jan. 31 this year was $24,243. F. C. Chambers, president of the company, estimated that the institution of one-man cars would have meant a saving of more than $200,000 annually and a reduction of fares under the present service-at-cost franchise.

J. G. Gamble, attorney for the railway, announced that he will ask for a rehearing.

Dr. A. A. Mitten Made Chairman of Philadelphia Committee

Thomas E. Mitten, for sixteen years chairman of the executive committee of the Philadelphia Rapid Transit ComCompany, Philadelphia, Pa., relinquished his post on March 16 in favor of his son, Dr. A. A. Mitten. The elder Mitten will continue as chairman of the board of directors, but will shift much of the burden of active management to the son, it is understood.

Coleman J. Joyce, counsel, and Leon Jewell, vice-president in charge of traffic, resigned from the board of directors. They were succeeded by J. A. Queeney and Ralph T. Senter, respectively.

Terminable Permit Legislation in Illinois Unlikely

The long-delayed report on terminable permits for public utilities in Illinois has been presented to the state Senate by Senator Richard J. Barr, chairman of the joint commission which spent two years studying the subject.

The recommendation of the commission urges the adoption of terminable permits as the franchise scheme in the state. It does not suggest what agency shall issue the permit, nor the terms, nor under what conditions a permit shall be terminated. The recommendation does not go farther than urge that the terminable permit method be adopted.

The failure of the House and Senate to present a report in a formal way is said to have injured the chances of any terminable permit legislation at this session. Senate and House members predict that no act will pass the present session of the General Assembly. The recommendations contained in the report were reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 8, page 92.

Amends Fare Petition

New Plan Advanced by Pacific Electric Includes Reduction in One-Way and Round-Trip Fares

A supplemental application to its recent request for a hearing on the petition for a general increase in fares has been forwarded by the Pacific Electric Railway, Los Angeles, Cal., to the California Railroad Commission. The new application asks for an entirely new set of fares to be established temporarily on certain lines. The plan contemplates a material reduction in one-way and round-trip fares, but an increase in the present form of daily commutation tickets. It is proposed to provide only one form of commutation ticket, namely, the 30-ride family ticket with a limit of 90 days from the date of sale, which will be at a lower rate than the cost of the same ticket at the present time, yet will be higher than the present daily commutation ticket. In the new schedule of fares contained in the supplemental application only one-way fares and 30-ride commutation ticket fares are provided. The round trip will be double the one-way fare. According to the supplemental application these are to be tried out during the investigation by the Railroad Commission with the understanding that if a trial of these fares for a reasonable length of time proves that they are unsuccessful in materially increasing traffic volume, the company has permission to restore the present fares without delay.

The original application for a general fare increase asked to advance the fares 14 per cent over the present rate. At the present time the Pacific Electric is operating two distinct classes of services, a local and city service and an interurban service. The proposed set-up contemplates three classes of fares and service—the local or city service as it is at present; a scale of fares for suburban service extending to surrounding points of metropolitan district, and the interurban service to more distant points.

In commenting upon the new application, D. W. Pontius, vice-president and general manager, said that the purpose of the original application for an approximate average increase of 14 per cent was to provide sufficient additional revenue to meet operating expenses and fixed charges. As set forth he claimed these had been far below a reasonable return on the investment. He said that residents in communities near Los Angeles and chambers of commerce there had expressed the belief that a reduction instead of an increase in the one-way and round-trip fares would produce a material increase in travel volume and a like increase in revenue because of such volume. It was his contention that operating results had been so discouraging that the company was willing to experiment with the lower fares for a reasonable length of time, although it might lose in revenue, but with a view to the possibility of working some plan in the way of increased fares that would be of benefit not only to the railway but to the community served.

Jersey Legislature Passes Paving Bill

The New Jersey Assembly passed on March 15 the bill introduced by Senator Abell of Morris County to relieve electric railways of a part of their street paving obligations. The vote was 36 to 20. Governor Moore is expected to veto the measure.

The Board of Freeholders at Newark, N. J., has taken its fight against the electric railway paving bill direct to the people in paid advertisements in newspapers, a step which is believed to be without known precedent.

The Freeholders analyze the paving bill, present their arguments against it and wind up by repeating that a nonpartisan commission should be appointed to study the paving problem. They say in part:

> The Board of Freeholders of the County of Essex, in the interest of taxpayers, has consistently opposed for several years the repeated efforts of the traction interests to get from under their obligations in this manner, and the board has been continuously aided in its efforts by the State Association of Freeholders, the State League of Municipalities and representative civic bodies.
>
> The Board of Freeholders and these bodies have always advocated the study of the franchise, contractual and other financial relations between traction companies and municipalities and counties before any such sweeping legislation is enacted. We have requested our representatives in the present legislation to propose and further in the Legislature the creation of an impartial commission for the purpose of such study.

Each section of the measure is numbered and discussed by the Freeholders in an adjoining column in the "ad" itself. Traction company "sales talk" is the way the first section is described.

Henry L. Doherty Out of Routine Work

Henry L. Doherty, president of the Cities Service Company, New York, has addressed a letter to stockholders of his companies describing the condition of his health and announcing that he never expects again "to take an active part in the routine work" of the business.

He insisted that his organization had been so perfected that it would function perfectly without him. He intimated that on account of his health it had become necessary for him virtually to retire from active business and said that he was "still unable to conduct business in the ordinary way." Among other things he said:

> At all times my business affairs have been provided for by will and by provision for trustees. If anything should happen to me now, or at any other time, there is no reason why it should lessen the intrinsic value of the securities of the Cities Service Company by a single dollar. I have taken no part in the routine work of the Cities Service Company since the United States got into the World War, and never expect again to take an active part in the routine.

Wage Demands in New York State

Employees of the New York State Railways are drafting their demands for a wage increase and other concessions in their yearly agreement. The old agreement expires on May 1. While no formal demands have yet been presented to the railway, union officials make no secret of the fact that the men in Utica, Rochester and Syracuse will ask an increase in wages of 10 cents an hour, placing of two-man and one-man car operators on the same scale and a six-day week.

The present wage scale is 60 cents an hour for operators of one-man cars; 55 cents an hour for two-man car operators and 57 cents for interurban employees. The 10-cent increase has been filed in every proposal of the union since 1923. It is expected that 70 cents an hour flat scale for one-man and two-man car operators will be asked.

The union leaders base their plea for a pay increase on the fact that fares have been raised in all three cities, although very recently in Utica and Syracuse. Fares in Rochester were raised to 8 cents in January, 1925. Officials of the railway point to the increased costs of operation and the short tenure of the fare boost.

All proposals are submitted to joint vote of the workers in the three up-state cities. While the contract expires on May 1, any agreement reached after that date becomes retroactive. The contract provides for arbitration and there is a joint conference board made up of the presidents and business agents of the divisions of the Amalgamated Association in the three cities.

Disqualification Proceedings in Seattle

The United States Circuit Court of Appeals in San Francisco has denied a petition of John G. Von Herberg, a taxpayer of Seattle, Wash., to disqualify United States Judge E. E. Cushman from hearing a taxation action involving the city of Seattle and the Puget Sound Power & Light Company. Mr. Von Herberg has filed in the trial court an affidavit of prejudice and bias on the part of Judge Cushman. Judge Cushman certified to the Circuit Court the fact that such affidavit had been filed. In his petition to the Circuit Court Mr. Von Herberg, through counsel, contended that Judge Cushman in so certifying had automatically disqualified himself, and asked for an order selecting another judge. The court held that it lacked jurisdiction.

The Circuit Court of Appeals also has under advisement the matter of disqualification of Federal Judge Jeremiah Neterer in the Seattle Municipal Street Railway litigation and also a motion by J. Ambler Newton, assistant corporation counsel in Seattle, to dismiss all actions pending in federal court against the Washington municipality in the railway litigation. Attorneys for the Puget Sound Power & Light Company appeared before the court and argued to have Judge Neterer disqualified on the grounds that he is a Seattle taxpayer and therefore would be prejudiced.

Attorneys for the city of Seattle declared that the city is not a party to any disqualification proceedings and urged that the higher court dismiss the litigation.

Home Rule Referendum at Chicago's Mayoralty Election

Managers of the local Democratic organization have succeeded in collecting approximately 260,000 signatures on a petition for a referendum on the question of whether Chicago shall come from under the state public utilities act and restore to the city substantial control over its public utilities.

By virtue of the filing of this petition with the county election board on March 6 the question is automatically placed on the ballot at the Mayoralty election April 5. A minimum of 184,000 names was required by state law in order to submit the proposition to the voters. If the referendum is passed at that time, control of all local utilities will be taken from the hands of the Illinois Commerce Commission and vested either directly in the Chicago City Council or in a local commission created by the Council. This would take place as soon as the city clerk formally notifies the state commission of the outcome of the vote.

Under the state public utilities act, which created the Illinois Commerce Commission, it is provided that any city desiring to withdraw from the rule of the commission and set up one of its own selection may do so by agreement of a majority of the voters at a Mayoralty election. The acts of a city commission are, however, subject to review on appeal by the state commission. There is now pending before the Legislature, however, an amendment known as the McCluggage bill, which would bring appeals directly to the courts.

East St. Louis Goes to Church

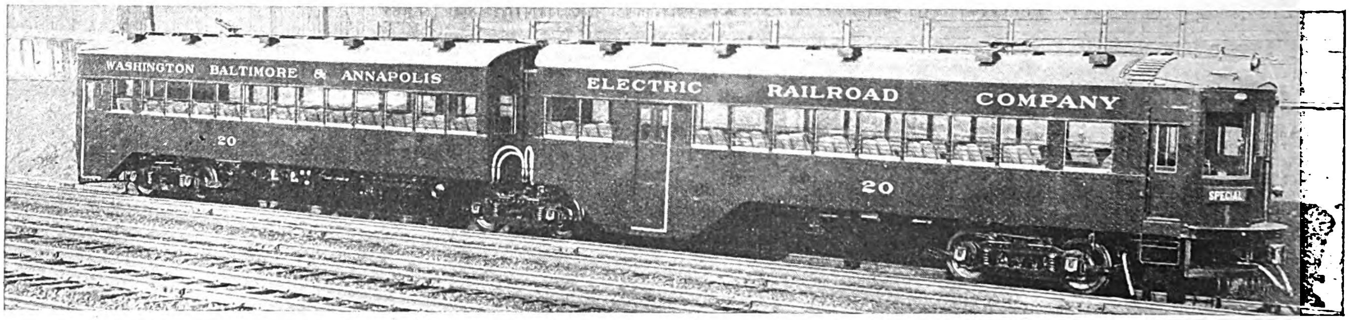
The "return pass" system to increase Sunday traffic on its street cars and bus lines has been temporarily adopted by the East St. Louis & Suburban Railway. Residents of East St. Louis, Belleville and Alton, Ill., will have an opportunity to use the plan during all of the Sundays of the Lenten season. The special plan became effective on Sunday, March 6, and on the first day 380 persons availed themselves of the reduced rate and much publicity for the railway was won. The passes, at first good only between the hours of 5 a.m. and 1 p.m., are now effective between 4 a.m. and 1 p.m. and between 6 p.m. and 10 p.m.

The cut rate was advertised by the company as a special inducement to residents along its lines to "go to church." Advertising cards have been placed in all of the street cars and buses operated by the company advising the patrons to take advantage of the reduced rates and "Go to Church During Lent." Under the pass system a passenger pays 10 cents and receives a coupon valued at 10 cents when applied toward the cost of the return trip. Residents of Belleville who wish to attend church services in East St. Louis can save 10 cents on the round trip.

New Fare Schedule on Massachusetts Interurban

An increased schedule of fares for the occasional rider went into effect on the Boston & Worcester Street Railway, Framingham, Mass., on Feb. 15. Zone tickets are still sold at 66 for $2.50 and there has been no change in the zones. The fare on the Marlboro crosstown line has been increased from 5 to 6 cents. The former basis of fare for the occasional rider was 10 cents for any two continuous fare sections and 5 cents for each additional fare section. The new basis is 10 cents within one fare section, or 6 cents a fare section. An exception is made on buses operating between Park Square, Boston, and Salem Square, Worcester, by way of Watertown and other places.

The former rate for pupils' tickets has been increased from eighteen zone coupons for 45 cents to twenty tickets for 60 cents. The old schedule of round-trip tickets from Chestnut Hill to Natick and thence to Worcester remains unchanged. The provision that each fare section is approximately 1⅔ miles is left out of the new schedule. A tariff rate for special buses filed with the State Department of Public Utilities is 50 cents a mile from point of origin to point of destination plus 30 cents a mile for dead mileage, plus operator's hourly rate for all time held.



First of Ten High-Speed Articulated Cars to Be Delivered to the Washington, Baltimore & Annapolis from the Philadelphia Plant of the J. G. Brill Company

Operation of Rochester Subway Railroad Urged

All indications point to operation of the municipally owned subway railroad in the bed of the abandoned Erie Canal in Rochester, N. Y., by the New York State Railways, Rochester lines. At a public hearing no serious opposition to leasing the line to the railways for a three-year trial operation was voiced. Previously Mayor O'Neil had intimated he was considering municipal operation if there were enough public and official sentiment for it.

Members of the Mayor's official family and of the city municipal research bureau, however, have gone on record as being in favor of turning the operation of the railroad over to the transportation company, which is the only agency with the equipment, experience and men to take it over at once. The Mayor has arranged conferences with city and transportation officials, from which is expected to evolve a new contract for operation by the railways under service at cost. Pressure of business interests will, it is believed, force early action by the municipal authorities. The line is nearly completed, the cost to the city has been heavy and leading industries and business houses are demanding that a plan of operation be speedily worked out.

New Articulated Cars Between Baltimore and Washington

The new Pullman type cars to be placed in operation by the Washington, Baltimore & Annapolis Railroad were inspected officially on March 11. Utility commissioners and operators from Cleveland, Washington and Baltimore asserted that the luxury of the new cars constituted an effective reply by interurban electric lines to the rapidly increasing competition of buses. The first of the two-car units to reach Baltimore was run over the line from Washington to Baltimore.

J. J. Doyle, president of the Washington, Baltimore & Annapolis, was in charge of the inspection party. Visitors present were J. H. Alexander, president; Charles H. Clark, maintenance engineer; Terence Scullen, master mechanic, and Paul E. Wilson, vice-president, all of the Cleveland Railway; Samuel Bole, engineer of the J. G. Brill Company; H. B. Potter, general manager; S. E. Emmons, assistant to the president, and Adrian Hughes, United Railways, Baltimore, and A. S. Wentworth, Westinghouse Electric & Manufacturing Company.

Six new units are now being placed in operation. The four others will be delivered the latter part of this month. Mr. Doyle has said that the early test trips were very satisfactory. He believes that the improvements in riding quality and in comfort attained by the articulated effect, the luxurious revolving seats and the other fine appointments are going to answer satisfactorily the demand for luxury on the part of the high-grade clientele.

February Safety Banner in Rochester Awarded

The safety banner for February on the lines of the New York State Railways, Rochester lines, went to the Main Street East division, which operated 8,932 miles per accident; second in line was the Portland division with a record of 6,713 miles per accident. Reports showed that the one-man cars operated more miles with fewer accidents than the two-man trolleys. This competition is part of the campaign under Safety Director Leon R. Brown.

Improvements on Skokie Valley Route in Effect

Operation of all except two through trains between Chicago and Milwaukee over the new Skokie Valley route, installation of a new fast service between downtown Waukegan and the Chicago Loop over the Skokie Valley line and the addition of several more stops made by certain limited trains were simultaneously effected by the Chicago, North Shore & Milwaukee Railroad on Feb. 20. The new schedule of operation over the Skokie Valley route centralizes all high-speed operations on this new stretch of private right-of-way. The new station stops scheduled for several of the Chicago-Milwaukee limiteds are North Chicago, Waukegan, Zion, Kenosha and Racine.

Phoenix Voters Will Pass on Rehabilitation Plan

April 30 has been set by the City Commission as the date for special election on the proposed $750,000 bond issue for the complete rehabilitation of the Phoenix Street Railway, Phoenix, Ariz. Mayor Frank E. Jefferson asked if it might not be feasible to submit also an alternate proposition to the voters on April 30 to provide for rehabilitation of only certain portions of the railway system at less cost. It was pointed out by City Attorney W. L. Barnum that the dominating issue was to determine whether the city was within its constitutional rights in incurring indebtedness for the rehabilitation of the system.

"Zero Hours" in Atlanta

During the month of February, 24 "zero hours" were posted for the trainmen of the Georgia Power Company, Atlanta, Ga., in which time only one accident occurred traceable to the negligence of a street railway employee. The "zero hour" idea was originated by W. J. Rountree, safety director for the company. Every day one hour is taken as "zero hour." The hour so chosen each day is posted on all of the transfer boxes of the company, and during that hour every precaution is taken by motormen and conductors to keep a clean record. The psychological effect of the "zero hour" has been to show train crews how easily accidents can be prevented if only a little thought and care are employed. Later it is planned to extend the "zero" period for a complete "zero" day.

Rate Increase Sought by Gary Railways

That earnings have never been sufficient properly to support service on the Gary and Valparaiso division was given as the reason for a proposal to increase certain commutation rates between Gary and Valparaiso filed on March 8 with the Indiana Public Service Commission by the Gary Railways.

Commutation rates between Gary and Valparaiso on the company's Valparaiso division are now considerably less than the lowest commutation rate offered by the Pennsylvania Railroad, the only competing line, the petition states. The proposed increase in fare will enable the railway, which operates cars directly to the various mills in Gary, to continue the present schedule between the two communities and to provide better service for the many Gary mill workers residing in Valparaiso, it is pointed out.

The company asks permission to cancel the present 25-ride commutation ticket, which is good for transportation between Valparaiso and any point within the first fare zone in Gary and sells for $7.50, and to issue a ten-ride bearer coupon ticket at the rate of $4. Should the authority be granted by the commission, the new rate will go into effect 30 days after the issuance of the enabling order.

In support of the company's application, the petition points to an extensive program of rehabilitation begun last year to make the Gary-Valparaiso division one of the most efficient interurban lines in the company's system.

Contract for New East River Line Approved

The Board of Estimate of New York City in committee of the whole has voted unanimously to approve the contract for the construction of the tunnel under the East River from the foot of East 53d Street, Manhattan, to Nott Avenue, Long Island City. Formal award of the contract to Patrick McGovern, Inc., for the bid price of $10,631,550 is expected to follow.

The board's action was taken on the recommendation of John H. Delaney, chairman of the Board of Transportation. Mr. Delaney denied the contention of opponents of the construction of the 53d Street subway that the tunnel was unnecessary. One particularly significant remark of his was that unification of the city's rapid transit lines was "inevitable." He did not indicate just how he expected this unification to be accomplished.

Trolleys Over Camden Bridge Assured

The first steps in the running of railway cars over the Delaware Bridge was taken on March 10 when the Camden City Commission passed an ordinance giving the Public Service Corporation of New Jersey the right to lay loop tracks from the Camden bridge plaza to the center of Camden. Since that date the Philadelphia Rapid Transit Company has announced that it would join with the Public Service Corporation of New Jersey in an application to the Delaware River Bridge Commission for trolley operating privileges across the interstate span. Permission to build the loop was given to the Camden Horse Railway, an underlying concern of the Public Service Corporation. Under the plan thousands of people each day will be able to travel in the trolleys of the Philadelphia Rapid Transit over the bridge and then over the Public Service rails to Camden. Details are being worked out by engineers of both companies, which now are operators of a bus service across the bridge.

News Notes

Weekly Pass in Texarkana. — The Southwestern Gas & Electric Company, Texarkana, Ark., is selling weekly passes on its lines for $1.

High Honor for Motorman.—Tal F. Harris, a motorman of the Nashville Railway & Light Company, Nashville, Tenn., was recently presented a handsome gold watch and made the subject of a citation before operators and officials of the company. Attention was directed to his ten years of operating without the semblance of an accident and to his equally notable record for courtesy. The watch presented to Mr. Harris bore an inscription signed by B. C. Edgar, president. It read: "Recognizing a distinguished safety and service record." His record shows approximately 320,000 miles run and 1,825,000 passengers carried.

Amends Fare Request. — The Colorado Springs & Interurban Railway, has asked the City Council of Colorado Springs, Col., to consider the retention of the present 10-cent fare, but abolish the two fares for 15 cents and instead accept tickets at six for 50 cents or fifteen for $1. The City Council had previously declined to approve the ticket-selling idea because it required the purchase of $1 in tokens.

Excursion Trips Offered.—The Union Traction Company of Indiana, Anderson, Ind., has started special excursions over its lines to various points of interest and the response thus far has been good. Each weekend the company offers special rates to certain points. Recently a trip to the Circus City zoölogical gardens, near Peru, was offered. Here the patrons can see one of the largest collections of wild animals in the country.

New Demands in Scranton.—Motormen and conductors of the Scranton Railway, Scranton, Pa., have prepared demands to be embodied in a new agreement replacing the old one which expires on April 1. They ask that the hourly rate be raised from 64 to 74 cents, while one-man operators, now receiving 72 cents, want 89 cents an hour. The men also want an eight-hour day on all runs with time-and-a-half pay on hour-over schedule runs. This stipulation is incorporated in the present working agreement, but the runs are said to vary in time from eight to 9½ hours. More than 600 motormen, conductors, brakemen and trackmen will be affected by whatever changes are made in the agreement.

Would Change Method of Handling Freight.—A change in the method of handling freight shipments on the Illinois Traction System at Champaign, Ill., has been announced with the completion of the "Champaign Belt," on which engineers of the Illinois Traction System have been engaged for about a year. The traction system has electrified approximately 5½ miles of the main lines of the Illinois Central and the Wabash Railroads at Champaign, and in future all freight transported by the Traction will go on the new belt line, hauled by electric locomotives.

Mutual Track Arrangement to Improve Service.—Residents of East Boston, Mass., have lost their fight to prevent the Eastern Massachusetts Street Railway from operating through cars over the lines of the Boston Elevated to Maverick station in order to improve the service to Revere. The public utilities department has issued an order providing for the through service, stipulating, however, that not more than six cars an hour shall be so operated. The department in its order referred to the contention of the trustees of both companies that this arrangement would effect a saving in operating expenses over that obtaining at the present time and would improve the service both for the people of Revere and the people of East Boston.

Conductor Punished for Theft.—Delbert Kraft, conductor on the Jackson lines of the Michigan Electric Railway, was sentenced on March 11 to serve from six months to five years in prison for pilfering fares. The court recommended that he serve six months. Conductor Kraft pleaded guilty and said he was driven to the theft by financial straits. Judge Benjamin Williams declared that he could not place Conductor Kraft on probation because there were 2,400 conductors in Michigan who might be tempted to take the funds of their companies if they thought that they could escape. The offender was not required, however, to pay any cost or fine or to refund any money to the company. He was $300 short in his returns.

Employees Enter Contest. — An essay contest for railway employees, arranged by W. J. Rountree, safety director for the Georgia Power Company, on the subject of "What Do We Owe the Passenger for His Fare?" resulted in the submission of approximately 100 essays of high quality. C. H. Strong, assistant to the manager of the railway department; B. K. Godfrey, manager of the compensation department, and L. K. Starr, publicity director for the Georgia Power Company, were judges. W. C. Alsobrooks, a conductor, was winner of the first prize, with C. H. Varn, a motorman, in second place and S. J. Steele, also a motorman, in third position. The first three essays are to be printed in full and distributed to the 1,500 trainmen in the railway department, as it is believed the essays, written by members of the crew, will go much further toward developing a spirit of courtesy among employees than any number of memos from headquarters.

Recent Bus Developments

Bus Activities in Springfield Planned

Sidney H. Sayles, superintendent of the Springfield Street Railway at Palmer, Mass., has announced that bus service will supersede railway service on the Three Rivers, Bondsville, Ware and Monson lines shortly after May 1. H. M. Flanders, general manager of the company, has applied to the Selectmen of the towns for the necessary licenses to operate buses. The railway was granted licenses to operate bus service in the territories mentioned one year ago and these licenses expire May 1. The Springfield company never attempted to make use of the privilege last year, but Mr. Flanders was assured that the licenses would be renewed. The company has also applied for licenses to operate buses between the Palmer-Wilbraham and the Palmer-Brimfield boundaries. The railway lines operating between Palmer and Worcester are to be abandoned. This will clear the way for a through line of buses between Springfield and Worcester. De luxe buses will be operated.

High Point Awaits Bus Operation

A bus system to be placed in operation in High Point, N. C., some time this spring will mark the discontinuance of railway service. An agreement to this effect was reached by the City Council, officials of a bus company and officials of the North Carolina Public Service Company, the railway operator. The latter company waived its carrying rights in favor of the buses. The buses will be operated by the Carolina Transit Company, Columbia, but if they do not meet the needs of the city, the North Carolina Public Service Company has agreed to re-establish railway service.

Ten new buses are to be started, covering about three times as much territory and serving several times as many people as the street cars at the present time. One line will extend to High Point College and the other will go to the baseball park.

Missouri Bus Bill Passes Senate

The Missouri Senate on March 9 by a vote of 25 to 5 passed Senator A. L. McCawley's bus control bill. It places all bus lines in the state outside of Kansas City under the jurisdiction of the Missouri Public Service Commission. The bill provides special taxes of from $60 to $1,000 per bus and limits the bus to not more than 25 ft. in length nor 84 in. in width. St. Louis buses will not have to pay the extra state tax, but will continue to give the city a percentage of their gross receipts for the use of its streets. The highways committee of the Missouri House of Representatives on March 8 voted to report favorably a bill placing control of bus lines using state highways and streets under the supervision of the Missouri Public Service Commission. The measure also provides for special license fees to be paid by the bus companies.

Bus Subsidiary of West Chester Street Railway Reorganized

Reorganization of the Peoples Transportation Corporation, a suburban bus subsidiary of the West Chester Street Railway, West Chester, Pa., was effected on March 4. The two companies operate under the route name of "The Chester Valley Lines." During the proceedings, participated in by representatives of fifty creditors with aggregate liability accounts of $500,000, the following were elected officers to handle the affairs of the company: C. B. Cooke, Jr., Philadelphia, president; F. G. Wilson, Chicago, treasurer and general manager, and Eric H. Biddle, Philadelphia, secretary.

Under the plan of reorganization, sufficient security and credit were offered to offset the unsecured liabilities of $102,000, which represented indebtedness to local supply houses, in addition to the amount owed the Yellow Truck & Coach Manufacturing Company for buses. The assets of the company, exclusive of value of franchise rights, before the reorganization plan was effected were almost equal to the liabilities. Secured loans from the parent company total approximately $300,000, and liabilities of $250,000 included in creditors' statements have been offset by a like amount in equivalent values.

The Peoples Transportation Corporation operates 40 buses through the Chester and the Schuylkill Valleys. Its lines connect Reading, Pottstown, Norristown, West Chester, Chester and Wilmington, and Media and Oxford. The West Chester Street Railway owns all of the outstanding stock of the Peoples Transportation Corporation.

More Plans Matured at Worcester

The Worcester Consolidated Street Railway, Worcester, Mass., has asked the Department of Public Utilities for permission to extend its June Street-Tatnuck bus line. The Consolidated plans a terminus at Dawson Road, a mile north of Tatnuck Square. At the start trips will be made at night, noon and morning to accommodate workers. The bus service in this section the company believes is desirable because of the growth of the neighborhood.

The company has started bus service between Worcester and Clinton, Mass., by way of Boylston. The Worcester terminal is the Union station and the Clinton terminal the railroad station in that town. The fare between the two places is 50 cents. The buses are express part of the way.

Bus Brings Increase in Riding.—The six months experiment in the substitution of bus service for city railway service at Manitowoc, Wis., by the Wisconsin Public Service Corporation has met with a certain measure of success. During December, 1926, there was an increase of 43.4 per cent in revenue passengers compared with December, 1925, when the railway cars were still in use. January, 1927, showed a further increase, with 46.1 per cent more passengers riding than in the similar month of 1926.

Would Extend Bus Service. — The Connecticut Company is planning further extension to its bus service and has applied to the Public Utilities Commission for permission to operate between Hartford and West Hartford, Conn., as an amendment to its present charter.

Bus Bill Favors Portland Company.—A bill to permit the Portland Railroad, Portland, Me., to operate buses as it may see fit has been passed by the Legislature. An attempt to amend the bill so as to prevent the railway from taking up any of its tracks or discontinuing operation of cars when bus operation is started was lost.

Bus Line Now Serves Oklahoma City Addition.—The Oklahoma Railway established a new bus line from the downtown section of Oklahoma City to the Crestwood addition in the northwest part of the city on March 1. Buses are being operated on a twenty-minute schedule. Several new buses of the latest design have been installed.

Another Motor Coach Route in Pittsburgh.—The Pittsburgh Motor Coach Company, Pittsburgh, Pa., has been granted a franchise to operate a fifth motor coach route beginning March 21 between Union Station and the intersection of Lebanon Boulevard and Washington Road in the high-grade South Hills suburbs. The distance is 7 miles and the expected running time 32 minutes. Limousine coaches each seating nineteen persons will be operated at intervals of twenty minutes off-peak and twelve minutes peak. As on the other routes of this company, the fare will be 25 cents.

Oppose Bus Operation.—Petitions of the Sandston Electric Railway for authority to abandon the 2½-mile stretch of tracks and to operate bus service between Richmond and Highland Springs, via Seven Pines and Sandston, have been dismissed without prejudice by the Virginia Corporation Commission, following a hearing at which considerable opposition was voiced to both petitions. The company is owned by the Richmond-Fairfield Railway, Richmond. The petitions were dismissed at the request of S. W. Zimmer, counsel for the railway, who said the opposition was "unexpected," and that he wished to consult with Oliver J. Sands, president of the railway and prominent Richmond bank president, now out of the city, before taking further steps. John Randolph Tucker, counsel for minority stockholders and for persons living along the line, explained that his clients feared that operation of a bus line would make the electric railway so unremunerative it might be abandoned.

Financial and Corporate

Day & Zimmermann Buy National Public Service

With Their Associates Acquire Controlling Interest from A. E. Fitkin—Mr. Zimmermann to Be President

Day & Zimmermann, Philadelphia, and their associates have acquired from A. E. Fitkin the controlling interest in the National Public Service Corporation. Mr. Zimmermann will be president of the company and Floyd W. Woodcock will be vice-president. No change in the operating personnel of the company is contemplated, but the company will have the benefit of the long experience of Mr. Zimmermann and his organization in the public utility field. The National Public Service Corporation with gross receipts of more than $27,000,000 has been built up by Mr. Fitkin, who remains on the board. The gross receipts of the Day & Zimmermann properties prior to this addition were about $12.000,000.

The most important properties controlled by the company are situated in the states of New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, Georgia and Florida, and serve an aggregate population of more than 2,000,000.

The principal companies controlled by National Public Service Corporation include Jersey Central Power & Light Company, Virginia Public Service Company, Tidewater Power Company, Florida Power Corporation, Eastern Shore Gas & Electric Company and the Municipal Service Company.

Mr. Fitkin in confirming the sale stated that he is surrendering the control and supervision of the affairs of the company because of his desire to devote all of his time and attention to his western properties known as the Inland Power & Light Corporation system.

The trackage of the railway properties included in the National Public Service Corporation totals 356 miles. Statistics of these properties follow:

	1926	1925
Transportation Department:		
No. of car-miles	12,206,733	12,218,198
No. of bus-miles	1,702,006	1,809,639
Total vehicle-miles	13,908,739	14,027,837
Passengers carried:		
Street railway	80,609,958	82,221,883
Bus	3,982,043	3,568,171
Communities served:		
Street railway	96	103
Bus	47	43
Population served:		
Street railway	772,980	755,000
Bus	686,844	683,000

Of the total earnings of $27,788,680 the receipts from transportation were $5,761,704, or 20.7 per cent.

The Tidewater Power Company operates the electric railway in Wilmington, N. C., and surrounding territory. The Municipal Service Company operates an interurban railway in Ohio known as the Youngstown & Suburban, the railway properties in York and Oil City, Pa., and controls the Keystone Public Service Corporation, which in turn, through its subsidiaries, operates the electric railway and bus lines in and around Scranton and Altoona, Pa.

Voters Disapprove Rainier Purchase

The Seattle & Rainier Valley Railway purchase was voted down in Seattle, Wash., by the people on March 8. The public showed by a large vote their disapproval of the purchase for $1,200,000 of the only privately owned car line remaining in the city.

Would Purchase Railway Bonds

The Massachusetts State Department of Public Utilities has received a petition from the New York, New Haven & Hartford Railroad for permission to purchase $330,000 in bonds of the Springfield Street Railway, Springfield, Mass. It is explained that there are now outstanding an equal amount of bonds of the Springfield & Eastern Street Railway maturing on Jan. 1 next. These are held by the New Haven and in order to refund them the Springfield company is to issue new bonds. As the terms said to have been offered by the bankers for the bonds are said not to have been considered sufficiently liberal by the New Haven, that company desires to take the entire issue in exchange for the maturing bonds at 6 per cent paying par.

1,574,969,902 Ride Surface Lines

Residue Receipts of $13,302,112 in Chicago Show an Increase of $1,144,438 or 9.41 Per Cent, the Highest Except 1922, the Year of an Eight-Cent Fare

The fiscal year Feb. 1, 1926, to Jan. 31, 1927, covered by the report of the Chicago Surface Lines, although the last under the 1907 and 1913 ordinances, was the most remarkable from the standpoint of service, traffic and earnings in the history of the companies comprising the Chicago Surface Lines. Gross earnings for the year were $61,173,601, an increase of $2,387,720, or 4.06 per cent, as compared with the previous year. This total was the highest in the history of the companies. Operating expenses including taxes were $47,871,490, an increase of $1,243,283, or 2.67 per cent. Residue receipts were $13,302,112, an increase of $1,144,438, or 9.41 per cent. This was the highest with the exception of 1922, the year of an 8-cent fare. The city's share of divisible receipts was $2,620,326, an increase of $498,273, or 23.48 per cent over the preceding year. The purchase price of the properties was increased $237,632, making the total of $163,745,856 as of Feb. 1, 1927.

Each month of the year showed an increase in traffic over the corresponding month of the previous year and the impressive total of 1,574,969,902 rides is an increase of 57,459,241 rides, or 3.79 per cent. Revenue passengers totaled 876,249,663, an increase of 34,048,210, or 4.04 per cent. To provide service for this great increase in traffic there were added during the year more than 4,000,000 passenger car-miles.

The daily average of revenue passengers during December—2,505,338—was the highest for any month in the history of the companies. The peak of the previous twelve months was exceeded seven times during the year. The biggest day of the year and the greatest in the history of the companies, both in earnings and in traffic, was Saturday, Dec. 18, passenger receipts being $201,337, revenue passengers 2,934,771, and total rides 5,126,731. Revenue passengers on an average Saturday during the year numbered 2,668,342. On an average Sunday or holiday there were 1,632,844 revenue rides, an increase of 18,021 in two years. This is particularly interesting as most companies have experienced a decrease in Sunday and holiday business. There were 287 revenue passengers (or 517 rides including transfers) on surface cars during the year for every Chicagoan.

The Eucharistic Congress, from June 20 to June 24, inclusive, established new records for surface car riding in Chicago—the total rides for the three heaviest days being 15,069,000. Transportation of this immense throng with expedition and safety brought expres-

EARNINGS, EXPENSES AND DIVISION OF RESIDUE RECEIPTS OF THE CHICAGO SURFACE LINES FOR YEAR ENDED JAN. 31, 1927, COMPARED WITH PREVIOUS YEAR

Earnings:	1927	1926
Passenger cars	$60,436,705	$58,076,487
Chartered cars	5,347	6,337
Newspaper cars	16,276	14,989
Freight earnings	5,039	4,867
Hospital car service	3,742	3,790
Advertising	281,837	274,480
Rents of buildings, etc.	160.885	165,150
Sale of power	108,210	104,097
Interest on deposits	132,366	120,682
Miscellaneous	23,188	14,997
Gross earnings	$61,173,601	$58,785,880
Expenses:		
Way and structures	$2,984,484	$2,830,649
Equipment	4,188,633	3,984,635
Renewals	4,893,888	4,702,870
Power—Maintenance	386,086	394,620
Power—Operation	3,638,283	3,465,460
Conducting transportation—Trainmen	21,485,750	20,741,205
Conducting transportation—Other	3,214,031	3,172,423
Traffic	123,433	109,973
General and miscellaneous—Damages	1,936,202	2,469,007
General and miscellaneous—Other	1,620,696	1,697,361
Taxes	3,400,000	3,060,000
Total expenses	$47,871,489	$46,628,206
Residue receipts	*$13,302,111	*$12,157,674
Divided:		
Chicago Railways — 60 per cent	*$7,981,267	*$7,294,604
South Side Lines—40 per cent	*5,320,844	*4,863,069

* Includes city's 55 per cent of net divisible receipts, as defined by ordinances.

RESERVE FOR RENEWALS AND SPECIAL RESERVE FOR RENEWALS AND EQUIPMENT BY CHICAGO SURFACE LINES COMPANIES FOR FISCAL YEAR ENDED JAN. 31, 1927

Reserve for Renewals:	Chicago Railways	Chicago City Ry.	C.&S.C.Ry.	Total
Balance in reserve at Feb. 1, 1926	$9,091,725	$5,082,143	$331,043	$14,504,912
Sale of unnecessary property and salvage	197,166	41,799	7,417	246,384
Interest earned	279,328	155,013	10,131	444,473
Balance in reserve at Feb. 1, 1927	$9,568,220	$5,278,957	$348,592	$15,195,770
Special Reserve for Renewals and Equipment:				
Balance in special reserve at Feb. 1, 1926	$489,415	$836,735	$768	$1,326,919
8 per cent of gross earnings	2,936,332	1,765,855	193,993	4,896,181
Interest earned	18,076	23,813	655	42,544
Total	$3,443,825	$2,626,403	$195,417	$6,265,646
Less: Expended for renewals	2,399,317	1,410,113	193,807	4,003,237
Expended for special equipment (new passenger cars)	927,934	666,999	....	1,594,933
Expended for track extensions	3,303	273,422	....	276,725
Expended for track reconstruction	....	40,255	1,557	41,812
Total expended	$3,330,555	$2,390,789	$195,364	$5,916,709
Balance in special reserve at Feb. 1, 1927	113,270	235,613	52	348,936
Total of balances at Feb. 1, 1927	$9,681,491	$5,514,570	$348,645	$15,544,707

Under orders of the Public Utilities Commission of Illinois and of its successor, the Illinois Commerce Commission, $7,753,736.09 has been expended since July, 1920, out of the "Special Renewal and Equipment Fund" for new equipment and for track extensions and reconstruction.

Although the property acquired by these expenditures is functioning as part of the operating plant, it does not appear in the Capital Accounts of the companies, inasmuch as the commission orders provided that such expenditures shall not be carried to capital account "unless and until the sum or sums thus expended have been paid into the renewal and depreciation fund."

The balance, $15,544,707, in "Reserve for Renewals" and "Special Reserve for Renewals and Equipment" is a cash balance and is on deposit in various banks.

sions of commendation from many sources.

In the period preceding the Christmas holidays, the peak of the year's riding, the companies attained 100 per cent operation. On Dec. 20 all passenger cars (3,639) were in service during the evening rush hours and on each of the three following days only one car was out of service. Henry A. Blair, president, says that better evidence could not be had of the condition of company equipment and the spirit of the men who worked together to accomplish this result.

In anticipation of the large increase in riding, 100 new cars of the multiple-unit type were ordered early in the spring and delivered in time for the pre-Christmas peak. This made a total of 445 new cars added to the service in a little more than three years.

Mr. Blair said it was worthy of note that during the past four years the Chicago Surface Lines have enjoyed a larger percentage of increase in passengers than any other street railway, and during the past year they carried approximately as many revenue passengers as all steam railroads in the country. It is also a fact that in spite of the handicap of expiring franchises, the 42 miles of track reconstruction and 5 miles of new track last year exceed the trackwork of any other surface system so far as available reports indicate.

Comparisons of extent of the Surface Lines' system at the end of the first year of unified operation (Jan. 31, 1915) and at the close of the thirteenth year (Jan. 31, 1927):

Items	1915	1927	Per Cent Increase
Gross earnings	$31,966,049	$61,173,601	91.37
Operating expenses	19,889,276	47,871,490	140.69
Taxes	1,439,279	3,400,000	136.23
Operating wages paid	10,560,039	29,812,518	182.31
Total wages paid	12,379,615	32,564,914	163.05
Revenue passengers carried	627,731,550	876,249,663	39.59
Total rides	1,115,312,129	1,574,969,902	41.21
Average fare per revenue passenger	4.99c	6.90c	38.28
Average fare per ride	2.81c	3.84c	36.65

A total of $107,141,358 has been paid for public benefits by the companies since the adoption of the 1907 ordinances, divided as follows: For cleaning right-of-way, including sprinkling and removal of snow and ice, $10,520,925; street paving, $15,968,578; maintenance paving, $6,094,824; general taxes, $33,572,782 (year 1926 estimated); track and overhead removal and replacement on account of sewer installation, etc., $1,889,378; city's 55 per cent of net earnings, $39,094,870.

TABLE OF INCREASE IN RIDING ON CHICAGO SURFACE LINES DURING PAST SIX YEARS

Year Ended	Weekday Average	Saturday Average	Sunday* Average	Total for Year
Jan. 31, 1927	2,521,897	2,668,342	1,632,844	876,249,663
Jan. 31, 1926	2,424,194	2,507,004	1,631,484	842,201,453
Jan. 31, 1925	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1924	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1923†	2,204,425	2,356,385	1,563,911	762,629,211
Jan. 31, 1922	2,129,217	2,251,293	1,560,310	750,515,622

* Includes holidays.

† Trainmen's strike Aug. 1 to 6, 1922, inclusive.

In the past two years 2,984 cars, or 84 per cent of the 3,539 cars owned, were put through the shops. Adding to these the 100 new cars in the last few months made it possible successfully to accomplish the task of carrying record-breaking loads in the holiday period. Through co-operation between the transportation and shops and equipment departments, a new record was established also for the small number of cars taken out of service on account of equipment failures—the car mileage per pull-in being increased from 7,100 to 14,389. Each motor car on the system traveled an average of 37,445 miles during the year—another high mark in history. There are now in service 80 one-man cars and 95 trailer trains. The new type of multiple-unit cars, used in 66 trains, is giving entire satisfaction.

Interest of trainmen in the prevention of accidents was kept at a high point throughout the year by a contest among the various divisions which ended on Jan. 31, with North Avenue depot, the largest on the system, the winner, and Lincoln Avenue depot a close second. Results were so satisfactory that another contest has been started for the coming year.

Mr. Blair says that although the number of motor vehicles in the Chicago district increased greatly during the year, improved methods of traffic regulation facilitated the movement of street cars. As Mr. Blair sees it the public has been awakened as never before to an appreciation of the harmful effects of traffic delays. He then refers to the fact that late in the year there was issued under the direction of the street traffic committee of the Chicago Association of Commerce a report covering the local traffic situation and offering suggestions for relief. He says:

> Many recommendations will be helpful to users of street cars if put into effect. Action has already been taken by the City Council, providing for a Greater Chicago Street Traffic Commission and the creation of a division of traffic engineering in the Bureau of Streets. The big problem of automobile parking still awaits a solution. The prohibition of parking within the Loop district during the Eucharistic Congress demonstrated to the satisfaction of the authorities that, notwithstanding the overcrowded condition of the streets, traffic could be handled faster and more safely. Credit should be given to the traffic division of the Police Department for making the best of a difficult situation.

The favorable insurance contracts entered into in October, 1923, expired with the close of the last fiscal year with an unusually low record for losses during the period. Renewal of insurance beginning Feb. 1, 1927, was arranged on a basis which will result in a further saving. All insurable property of the companies, amounting to about $65,000,000, is covered as required by ordinance. This insurance, written at the rate in effect three years ago, would have cost the companies over $145,000 more per year than they are now paying.

On the subject of bus activities Mr. Blair said:

> While all other transportation agencies in the Chicago district showed an increase in traffic last year, the Chicago Motor Coach Company, in spite of additional routes, reported a material decrease in passengers carried. This would indicate that the novelty of bus operation in Chicago is wearing off and that this form of transportation is losing popularity, which may be due in part to the fact that the much heralded special and superior service with the pledge of a seat for every passenger has proved a myth. The bus company is still experimenting with different types of buses, and it has as yet no uniform or standardized equipment. Even with the newest model it is still employing the solid

CAPITAL EXPENDITURES BY CHICAGO SURFACE LINES FOR THE FISCAL YEAR ENDED JAN. 31, 1927

	Chicago Railways	C. C. Ry.	So. St. Ry.	C. & S. C. Ry.	Total
Purchase price at Feb. 1, 1926....	$94,258,468	$55,819,970	$1,800,900	$11,628,884	$163,508,224
Capital expenditures during year..	299,152	57,438	328	87,185	444,104
15 per cent on same.............	44,872	8,615	49	13,077	66,615
Increase in fluctuating assets.....	*156,050	*104,033	....	....	*260,084
5 per cent on same..............	*7,802	*5,201	....	....	*13,004
Purchase price at Feb. 1, 1927..	$94,438,640	$55,776,788	$1,801,278	$11,729,148	$163,745,856

* Decrease..

STATISTICAL DATA OF CHICAGO SURFACE LINES FOR THE FISCAL YEARS ENDED JAN. 31

	1923	1924	1925	1926	1927
Rate of fare........................	8 cents 2-1-1922 to 6-14-1922 7c-6⅔ cents 6-15-1922 to 1-31-1923	7c-6⅔ cents	7c-6⅔cents	7c-6⅔cents	7c-6⅔ cents
Revenue passengers..................	762,629,211	824,850,103	830,151,540	842,201,453	876,249,663
Passenger receipts..................	$55,495,310	$56,986,687	$57,284,602	$58,076,487	$60,436,705
Total earnings......................	56,103,061	57,655,169	58,081,678	58,785,880	61,173,601
Operating wages.....................	27,163,996	27,458,736	29,246,390	29,012,641	29,812,518
Other operating expenses and taxes.....	17,252,072	17,381,016	17,328,569	17,615,564	18,058,971
Residue receipts....................	11,686,992	12,815,416	11,506,717	12,157,674	13,302,111
Less: Joint account expenses........	620,000	885,000	450,000	130,297	363,934
	$11,066,992	$11,930,416	$11,056,717	$12,027,376	$12,938,176
5 per cent on purchase price...........	8,039,343	8,076,569	8,127,158	8,169,099	8,173,918
55 per cent to city.................	1,665,206	2,119,615	1,611,257	2,122,052	2,620,325
45 per cent to companies..............	1,362,442	1,734,231	1,318,301	1,736,224	2,143,902

tire, of which there is growing complaint not only from riders but from the owners and occupants of buildings along the bus routes, and from taxpayers who are charged with renewal of pavement.

The recent proposal of the Chicago Motor Coach Company to substitute buses for the street railways has excited little interest and has not been taken seriously by the general public.

In the last year that company was permitted to make an extension of its Marquette Road route along the north side of Marquette Park and also an extension of its South Park Boulevard line from 60th Street to 79th Street.

A hearing has been had by the Illinois Commerce Commission on the application of the Chicago Motor Coach Company for authority to establish additional routes in the north division of the city. In this case there is squarely presented for decision the question whether the Chicago Motor Coach Company shall be permitted to depart from its original plan and policy of boulevard and parkway operation and to establish a general motor bus service throughout the city in direct competition with the surface and elevated railways.

On Nov. 18, the commission entered an order authorizing and directing the Chicago Railways to operate an auxiliary or supplementary motor bus line on Diversey Avenue. The Chicago Motor Coach Company intervened in opposition to this order and is now seeking a review by the courts. There is still pending in the Illinois Supreme Court for decision the case in which the city is attacking the right of the Chicago Motor Coach Company to operate on city streets without first obtaining a grant of permission or authority from the city.

Interstate bus operation from adjacent cities in Indiana into Chicago continues, and no substantial change in this situation can be expected until Congress enacts a law for the regulation of this class of carriers.

A plan for the solution of the local transportation problem of Chicago was submitted to the Mayor and City Council on Jan. 8, 1927. It proposes the development of a complete rapid transit system, utilizing elevated and subway structures; the unification of the surface lines, rapid transit lines and feeder buses on the basis of one fare with transfers from one class of service to the other, and the development of this unified system with a view to the future needs of Chicago. The plan, which is worked out in elaborate detail, calls for a total investment in local transportation of $1,000,000,000 by 1950 and would give Chicago the best local transportation system in the world.

Mr. Blair says that contrary to experience in other cities, where the expiration of franchises has resulted in slackened maintenance, curtailment of service and loss of business, these properties approached the crisis in the best of condition physically and operating at a high degree of efficiency. He says that this remarkable showing has attracted attention in the industry everywhere and quotes from articles in both *Aera* and the ELECTRIC RAILWAY JOURNAL, to indicate the wide interest manifested in the Chicago situation.

Mr. Blair says that in the twenty years under the franchise that expired recently the properties have been completely rehabilitated. The roadbed has been rebuilt and 486 miles of single track added. There are now 35 miles of track per 100,000 population as compared with 27 miles in 1907. Old and small cars have been replaced by larger cars, and much additional equipment has been purchased. Seat miles (car miles multiplied by the average number of seats in the cars) are more than double the number in 1907, although the population has increased only 45 per cent, and the service improvement is even greater than this indicates because, by careful scheduling, cars are being operated where and when needed. According to Mr. Blair these facts show forcibly the remarkable improvement in service. In accomplishing it the companies have put $107,971,000 in new capital and $7,753,736 from the Special Renewal and Equipment Fund into the properties.

Although wage rates of employees have increased upwards of 175 per cent since 1907, the average fare per revenue passenger is only 39 per cent higher and the average fare per ride but 28 per cent higher.

During the thirteen-year period of unification the companies have constructed 119 miles of new extensions (single track equivalent) at a cost of $6,220,693 and reconstructed 476 miles of single track at a cost of $27,642,318, of which $19,666,967 was paid out of the renewal funds and $7,975,350 was new capital.

Statement of Track Mileage of Companies Included in Chicago Surface Lines System

	Total Miles Single Track 1-31-26	Extensions 1926	Abandoned 1926	Net Extensions 1926	Miles Single Track 1-31-27	*Reconstructed 1926
Chicago Railways....................	594.34	0.90	0.44	0.46	594.80	28.17
Chicago City Railway................	335.97	3.67	0.04	3.63	339.60	12.15
Calumet & South Chicago Railway.....	127.21	0.80	0.04	0.76	127.97	1.90
Southern Street Railway.............	17.45	....	....	....	17.45	....
	1,074.97	5.37	0.52	4.85	1,079.82	42.22

* Includes track taken up and replaced account of sewers, special straight track renewals, etc.

Union of Washington Lines Goes Over to Next Session

One of the first problems to be studied at the next session of the United States Congress will be the merger of the railway lines in Washington, D. C. Chairman Capper said that with the work of creating the new Public Utilities Commission completed the committee would be in a position to concentrate on the question of the merger at the next session. The possible merger in the capital was one of the measures left unacted upon at the recently concluded session of Congress.

Columbia System Suspends

Railway service at Columbia, S. C., was indefinitely suspended on March 11 by the Columbia Railway, Gas & Electric Company largely because business has fallen off to a point where the expenditures needed to be made to the physical property to put it into proper operating condition would not be justified. Columbia is a city of more than 35,000 population. The railway system included 32 miles of line.

Ten-cent jitneys, operated at the whim of the owner, covering no particular territory but picking up passengers any and everywhere and taking them direct to their destinations—be it home or office—cut heavily into the patronage of the trolleys. They were considered quicker, the fare was the same as that charged by the street cars, and while they were often unsightly and in bad repair, their service seemed to appeal to popular tastes. Moreover, the street cars have met with sharp competition from two other systems of transportation. The Carolina Transit Company began the operation of about a score of 19-passenger buses some months ago, covering territory not touched directly by the railway lines, and as rapidly as the street cars would curtail their service, the bus company would expand, so as to serve, in a measure, the territory abandoned by the railway. By an arrangement between the two companies transfers from one system to the other were granted, but this arrangement did not seem to lessen materially the distress of the railway.

Months ago railway officials made known the straits to which they were reduced. One non-paying line after another was discontinued until only a few were left. Last month, on all lines in the city, not more than an average of 600 to 700 passengers a day rode the cars.

Personal Items

J. E. Wilmot Becomes Traffic Solicitor at Buffalo

J. E. Wilmot, formerly general manager of the Western New York Motor Lines, has been appointed general traffic solicitor for the International Railway and International Bus Corporation, according to a recent announcement issued by the company. He will devote his efforts to the stimulation of business throughout the Niagara frontier, including the Buffalo-Niagara Falls high-speed line, Niagara Great Gorge trip, the Falls View Bridge, the Queenston-Lewiston Suspension Bridge and Buffalo-Niagara Falls, Ltd., motorbus service.

J. E. Wilmot

Mr. Wilmot is a native of New York City, but is well known in Buffalo and vicinity because of his former connection with the Western New York bus lines, of which he was general manager. Under his direction the Rochester-Buffalo bus service was installed and operated. Mr. Wilmot has had five years experience with the White Company and three with the Mack.

F. J. Brennan New Brooklyn Division Superintendent

Francis J. Brennan, formerly superintendent of maintenance and operation of the Staten Island Railways, Department of Plant and Structures, New York City, has been appointed division superintendent at Maspeth Depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

Mr. Brennan was born in Brooklyn and was graduated from Erasmus Hall High School and Pratt Institute. In January, 1905, he was appointed a motorman at the 58th Street depot in Brooklyn. In December of the same year he resigned but returned two years later in the same capacity at the same depot. After several promotions he went with the Public Service Commission but returned to Brooklyn as supervisor of headways in the surface transportation department. He held that position until May, 1924, when he was placed in charge of operation of the bus subsidiary of the B.-M. T.

In March, 1925, Mr. Brennan resigned his position with the B.-M. T. and was appointed superintendent of maintenance and operation of the municipal railway lines on Staten Island.

G. S. Wills Resigns at East Liverpool

Gerry S. Wills, superintendent of the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, will resign on March 31.

Mr. Wills went to East Liverpool in September, 1925, from Wheeling, W. Va., where he had been general manager of the Wheeling Traction Company. For thirteen years he was in the employ of the West Penn Company, by which the Wheeling Company was controlled. In the fall of 1920 he went to Wheeling as assistant to C. P. Billings, vice-president and general manager, and on Jan. 1, 1922, was appointed general manager to fill the vacancy caused by the transfer of Mr. Billings to Pittsburgh.

As a young man Mr. Wills was employed by the Oneonta & Mohawk Valley Railway, Oneonta, N. Y., with which he remained from 1905 to 1906, when he secured a place as an apprentice in electrical engineering with the General Electric Company at Schenectady, N. Y. In 1907 Mr. Wills went with the Metropolitan Street Railway, New York City, as general carhouse electrician. His work there was supplemented by a two-year course in applied electricity at Pratt Institute.

Mr. Wills showed predilection for the railway business, however, for after two and a half years in the copper mining district of Arizona he returned East and entered the transportation department of the Citizens Traction Company at Oil City, Pa. In a short time he was made superintendent of the Franklin division. In 1916 he became affiliated with the West Penn interests at Pittsburgh, first with the general sales manager, as light salesman, then as power salesman and finally as assistant to the vice-president in charge of the commercial department. Mr. Wills was born in Norfolk, Va., in 1884. His activities and splendid results in public relations work in Wheeling were referred to in a review of Mr. Wills' career in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 8, 1925. To him properly belongs a large part of the credit for the successful rehabilitation of the property at East Liverpool, described in detail in the ELECTRIC RAILWAY JOURNAL, issues of June 26, 1926; July 3, 1926, and July 31, 1926. It is said that Mr. Wills will engage in the brokerage business in Norfolk, Va.

C. L. Wilson Heads Radial Department at Toronto

Charles Lewis Wilson has been appointed superintendent of the radial department of the Toronto Transportation Commission, Toronto, Canada. Mr. Wilson's contacts in railway management extend over a period of 30 years. His experience acquired in his recent position as superintendent of the Toronto and York District of the Ontario Hydro-Electric Railways will be of invaluable assistance to the Toronto Transportation Commission, which took over these lines on Jan. 11.

The new head of the radial department started his railway career with the Grand Trunk Railway, Montreal, in 1891. In 1892 he moved to Toronto to take a position with the Toronto Railway. After twelve years service in various capacities he was made traffic manager of the Toronto & York Radial Railway, then under the same ownership as the Toronto Railway. Later he was promoted to assistant manager and when the city of Toronto bought the radial lines in 1922 and placed them under the management of the Ontario Hydro-Electric Power Commission Mr. Wilson was made superintendent of the three lines, which now constitute the radial department of the Toronto Transportation Commission.

C. L. Wilson

His long association with the radial lines and the warm friendships he has formed are among the valuable assets of the most recent addition to the Toronto Transportation Commission services. Mr. Wilson was born in Boston, Mass., of Canadian parents in 1871.

Charles H. Bucher, for a number of years with the Northern Texas Traction Company, which operates the Dallas-Fort Worth Interurban, has been made district representative of the company. He will be stationed at Grand Prairie.

G. R. G. Conway has succeeded R. C. Brown as president of the Mexican Tramways, Mexico City, Mexico, which is controlled by English capital and has its main office in Toronto, Canada. Mr. Brown remains a director, a vice-president and in a consulting capacity.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Brill Gets First Motors for Philadelphia Subway Cars

Actual operation of Philadelphia's new $100,000,000 North Broad Street subway was brought a step closer March 15 with the arrival at the J. G. Brill plant of the driving motors, electrical controls and other equipment for the first of the 150 passenger cars ordered by the city and to be built by the Brill company. When completed these cars, of all steel construction, will embody every conceivable safety device, including automatic stop controls. Their total cost will approximate $6,000,000.

The equipment was shipped from the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company, this company having been awarded the contract for all the motive equipment, including controls, as well as 750 especially designed electric fans for the ventilation of the new cars.

The cars, with 210-hp. motors, will be 67 ft. long, 10 ft. wide and have a total height from the rails to the roof of 12 ft. 3 in. They will seat 75 passengers. There will be longitudinal seats for 25 passengers and transverse seats for 50 passengers. The cars are being equipped with canvas-lined rattan seats with cone springs.

Milwaukee Electric Starts Interurban Cut-Off Work

Favored by mild weather, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has already started construction work on the new $175,000 East Troy-Burlington interurban line cut-off which will connect West Junction on the rapid transit line with Fruitland station on the Burlington-East Troy line. The cut-off will permit trains to enter Milwaukee directly from the west instead of through West Allis, as at present. Completion of the connection will cut the running time between these cities and Milwaukee fully twenty minutes. Two trestles will be built, one of wood 450 ft. long and 40 ft. high and another of steel carrying the new line over parallel tracks of the Milwaukee Electric Railway & Light Company and the Northwestern Railway. An embankment of earth estimated at 54,000 cu.ft. will be included in the project.

Writ of Certiorari Denied in Resale Case

The Federal Trade Commission was defeated in another of its efforts to restrict enforcement of resale prices by manufacturers when the United States Supreme Court on March 14 declined to grant a writ of certiorari sought by the commission to review a decision of the Circuit Court of Appeals for the second circuit enjoining an order of the commission against Harriet Hubbard Ayer, Inc.

The commission had ordered the Ayer company to desist from certain practices to maintain observance of retail prices. The Circuit Court of Appeals, to which the company appealed, held that in order to establish unlawful price maintenance there must be a tendency to monopolize a line of commodities or an unreasonable restraint of trade; that there must be proved a general system of contracts between the manufacturer and all dealers, and that the practices must be characterized by fraud. The proof showed that the Ayer company refused to sell to only a few dealers because of price cutting and that most of its dealers maintained the resale price of the cosmetics sold by the company voluntarily.

Union Switch & Signal Gets Big Boston Contract

The city of Boston transit department has contracted with the Union Switch & Signal Company, Swissvale, Pa., to furnish all necessary automatic block signaling materials for the Dorchester rapid transit extension, involving an automatic block signaling system for the protection of train movements over 3½ miles of double track, 2½ miles of which is in the open and the remainder within the subway. Direct current at 550 to 600 volts is used for propulsion and the entire signal system, including the track circuits, will operate on 25-cycle alternating current fed to the transformers at 550 volts a.c. The signals will be of the color light type (indicating red, yellow and green), the work involving 38 light signals with instrument cases, 52 automatic stop layouts, 114 a.c. relays, 113 transformers, 91 Keystone insulated rail joints with track resistors, switch circuit controllers, etc.

Conference on Steel Cars Called in New York

THE New York Transit Commission on March 11 invited railway men and others to a conference on the subject of lighter steel cars to replace the present wooden cars in operation on the elevated structures in New York City. The meeting will be held on March 29 at the office of the commission at 270 Madison Avenue. Those invited to the conference are Frank Hedley, president of the Interborough; William S. Menden, president of the B.-M. T.; William H. Woodin, president of the American Car & Foundry Company; F. N. Hoffstet, president of the Pressed Steel Car Company; D. A. Crawford, president of the Pullman Company, and John H. Delaney, chairman of the city Board of Transportation.

For some months the commission, through its engineering force, has been conducting an investigation into the possibility of the development of a steel car sufficiently light in weight to be operated on the elevated structures of Manhattan, Brooklyn, the Bronx and across the Brooklyn Bridge.

The studies of its engineers have now reached a point where the commission feels that a conference is warranted, but it fixed an advance date to allow engineers time within which to gather their data on the present condition and weight capacity of the elevated structures and the experts of both the railroads and the car builders to formulate plans for the construction of modern steel cars light enough in weight to operate on the structures to which specific reference is made.

Where elevated structures are of insufficient strength to make possible the operation thereon of steel cars of the present design, the Transit Commission has pointed out that either these structures must be reinforced or a steel car of lighter weight must be designed. As the commission sees it, to reinforce the elevated structures so that they could bear the weight of the present steel cars would cost millions of dollars and would doubtless fail to have the approval of that portion of the public which is opposed to the indefinite retention of elevated structures. The commission says:

> Some time ago the Transit Commisssion's engineers began to plan for a lighter steel car for operation on the present elevated structures. These plans have progressed to such an extent that it was thought advisable to call the conference referred to.
>
> Steel cars for rapid transit operation were not developed until 1904. Up to that time all rapid transit operation was by means of wooden cars. Subsequent to the development of the steel car in 1904 more wooden cars came into operation because of the inability of the elevated structures to carry the new steel cars.
>
> The Transit Commission's engineers believe that recent progress in metallurgy and modern methods of steel rolling have made possible the designing of a steel car of lighter weight than, but of equal tensile strength to, the present steel cars.

Bradley and Wason Companies May Get $700,000 Car Order

Osgood-Bradley Car Company of Worcester, Mass., and Wason Manufacturing Company, Springfield, Mass., are expected to get the contracts for the new cars which the Worcester Consolidated Street Railway and the Springfield Street Railway plan to buy under the New York, New Haven & Hartford Railroad rehabilitation program. The Worcester company will build 50 cars for the Worcester Consolidated and the Wason company the 50 cars for the Springfield company. The cost of the cars is estimated at $700,000. Notice of the probable placing of this order was made in the JOURNAL for Feb. 19.

$800,000 Trackwork for Milwaukee if Council Consents

Application has been filed with the Common Council of Milwaukee, Wis., by the Milwaukee Electric Railway & Light Company for the necessary franchises which are needed to carry out several major street railway construction projects estimated to cost $800,000. Among these proposed improvements is the relocation and grade separation of the Milwaukee - Waukesha - Watertown rapid transit line for a distance of ten blocks within the Milwaukee city limits, a project which is regarded as one of the most important steps made in recent years toward improving transportation facilities. If approved by the city it will open the way for rapid transit service to a large and growing section and a vast area directly in line for annexation to Milwaukee. Plans call for the line to be relocated for a block south on a private right-of-way instead of running along Fairview Avenue. Grades will be separated at all crossings, and 61st and 62d Streets will be closed.

Another improvement proposed is the extension, within 90 days, of the Eighth-Muskego Avenue line along Teutonia Avenue from Nash Street to Lake Avenue and later to Atkinson Avenue. As soon as street improvements are completed on Atkinson Avenue a connection will be made between the Milwaukee Northern line tracks and those of the Eighth-Muskego Avenue line at Teutonia and Atkinson Avenues.

In order to provide a more direct connection between Wauwatosa and West Allis, which is another step toward the solution of the problem of rapid transit between those cities and Milwaukee, a crosstown line is to be built on 68th Street between Wells Street and the relocated rapid transit tracks, subject to later negotiations with the city of Wauwatosa. Upon completion of the 68th Street connection the company will seek permission to discontinue service over the private right-of-way near 51st Street between Wells Street and the rapid transit tracks.

St. Louis Car Company Issues New City Car Catalog

Designed especially to feature developments in the light-weight city type car, the St. Louis Car Company is mailing out a handsome 44-page catalog which contains, among other interesting features, general dimensions and a brief description of car orders filled in recent months. The text matter is profusely illustrated with exterior and interior views, and with floor plans of the various type cars. There is also a full list of details which the company considers essential in order to expedite delivery.

Commerce Department Warns Against Fake Publicity

Through Julius Klein, its director, the Department of Commerce, Bureau of Foreign and Domestic Commerce, has just issued the following letter warning American manufacturers against a gold brick publicity scheme that has originated with certain publishers abroad.

> Certain foreign publishing concerns, or parties purporting to be publishers, have approached a large number of American manufacturers by correspondence, offering to prepare and publish, without charge, in their trade publications articles of public interest respecting the business organizations of American concerns. An exchange of correspondence usually leads to the preparation of the article and finally to an exorbitant debit against the American concern involved for halftone cuts. The charges have varied between $100 and $600. Inasmuch as our investigations have developed that the publications have no circulation or standing and that an indication of fraud is very evident, it is suggested that you avoid direct dealings with any such publishers until after adequate investigation has been made.
>
> If approached in this way it would be well, before responding, to consult responsible American advertising agencies or this bureau. If you submit the name of the publication and the publisher to the specialties division of the bureau you will be informed whether these names are already known in connection with cases where other firms have been victimized. If you have had past experience with this class of solicitation, you will increase the effectiveness of our efforts to safeguard American industries by making the details available for the confidential use of this bureau.

Rolling Stock

Houston Electric Company, Houston, Tex., has placed an order for twenty new cars and ten buses, according to a recent announcement made by C. J. Kirk, Public Works Commissioner.

Mack Truck, Inc., New York City, reports the following bus sales to street car companies during the last few weeks: Boise Street Car Company, Boise, Idaho; Houston Electric Company, Houston, Tex.; Third Avenue Railway, New York City; Connecticut Company, New Haven, Conn., and the Utah-Idaho Central Railway, Ogden, Utah.

American Car Company, St. Louis, Mo., has been awarded a contract for seven 45-ft. 6-in., single-end passenger and smoking motor bodies by the Rockford Public Service Company, Rockford, Ill., which is part of Rockford & Interurban Railway, recently reorganized. Notice of the expected placing of this contract was carried in the JOURNAL of Feb. 19. The new bodies will be mounted on Brill 177-E trucks.

Track and Line

Arkansas Central Power Company, Little Rock, Ark., will lay new steel and permanent paving between its rails on Prospect Avenue from Lee Avenue to St. Mary's Academy, if plans to be submitted to the City Council are approved. The improvement, entailing a cost of approximately $150,000, will be one of the major construction jobs of the 1927 program of the concern, and will be the first work done under the 1927 budget. Rails of heavier section will replace the present 70-lb. rails now employed on the Pulaski Heights line. Work has been started on laying new tracks along Main Street from the north approach of the Main Street viaduct to 22d Street. All of the old rails have been removed and the new rails will be laid before work of paving the street is started.

Indiana Service Corporation, Fort Wayne, Ind., plans to extend during the coming summer its car lines in Fort Wayne. Such a project was discussed at the last meeting of the Board of Public Works. No definite arrangements were made, although President Feustel said more tracks would be needed badly before the summer was over.

ELECTRIC RAILWAY MATERIAL PRICES—March 15, 1927

Metals—New York

Copper, electrolytic, cents per lb.	13.075
Lead, cents per lb.	7.65
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.05
Tin, Straits, cents per lb.	69.375
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.575
Somerset mine run, Boston	1.95
Pittsburgh mine run, Pittsburgh	1.85
Franklin, Ill., screenings, Chicago	2.625
Central, Ill., screenings, Chicago	1.875
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, $\frac{9}{16}$ in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb.	4.20
Steel bars, cents per lb.	1.90
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	2.75
Sheet iron, galvanized (24 gage), cents per lb	3.65
Galvanized barbed wire, cents per lb.	3.25
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.80
White lead in oil (100 lb. keg), cents per lb.	14.50
Turpentine (bbl. lots), per gal.	$0.78
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.25
Rubber-covered wire, No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, cents per lb.	16.75

Paving Materials

Paving stone, granite, 5 in.	
New York—Grade 1, per thousand.	$130–$142
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.00
Light copper, cents per lb.	9.50
Heavy brass, cents per lb.	7.125
Zinc, old scrap, cents per lb.	4.25
Lead, cents per lb. (heavy)	6.375
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	15.25
Rails (short), Chicago, gross ton	16.75
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.50

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, March 26, 1927 *Number* 13

Two Developments that Mark Fundamental Progress

IMPORTANT places in the archives of transportation are destined for two achievements reported in this issue. One, the introduction of the articulated car into high-speed interurban service by the Washington, Baltimore & Annapolis Electric Railroad, is a development that at once makes a bid for increased patronage and reduced operating cost. Nothing has been spared to provide comfort of riding. This is brought out in the text and views of the cars in service. Yet, due to fundamental features of design, a 27 per cent weight saving was possible. Two men perform the work with greater ease than do three on a two-car train, and maintenance costs will be reduced because of the fewer number of units of apparatus to inspect and keep up.

The other event in the march of progress is the approaching début of the Springfield, Mass., car designed for city service. To be sure, it is still in the embryo stage, but it has great promise. Its conception grew out of the increasing desire to try out some of the plans the industry has talked about for many years. Finally, some two years ago C. V. Wood, president, and W. L. Harwood, chief engineer of the Springfield Street Railway, listed what in their opinion were the objectionable features of the design used universally in this country. On another sheet they listed the things that should be accomplished.

Then they began to build. Plans were made and immediately scrapped in favor of other plans destined to meet the same fate. Dozens of manufacturers were consulted. Finally, through the persistence of these Springfield executives, two trucks very different in appearance from the older types began to emerge, and steel and aluminum and wood shapes began to take the form of a car body also very different from that usually observed. The trucks are now complete and after many trials and changes the apparatus is being mounted.

While the proof of the pudding is in the eating, as the two Springfield men have emphatically stated, success has been attained in many of the aims set down two years ago. The car, accommodating 45 people in comfortable, amply spaced seats, will weigh something less than 24,000 lb. The body is attractively finished and is essentially an improvement in appearance, in the opinion of many who have viewed it in the state of partial completion. With the radical changes adopted in the truck material reduction of noise may be expected.

Coincident with this story of the Springfield car comes the announcement of the purchase for the electric railways at Springfield and Worcester of 100 new cars which do not embody the experimental features. It is to be regretted that the new design has not had a year or more of experience behind it so that it could have been adopted for this order. However, because of promises made by the New Haven Railroad at the time of its re-entry into the management of these two properties to effect an immediate improvement of rolling stock, it was considered inadvisable to postpone construction.

These two developments, one on the W., B. & A., the other at Springfield, are specific examples of the faith that large financial interests have in the future of the industry. They are not shaken in their belief that rail transportation never will become a thing of the past. But these events do denote the insistence of owners and operators that radical improvements must be made to compete with modern conditions. In the past the industry has not so much lacked in possibilities as in imagination and courage to progress.

An Excellent Measure Defeated After the Battle Was Won

PHILADELPHIA'S city government and the various local civic and merchants' associations were commended in the issue of this paper for Jan. 22 for the progressive spirit shown in adopting a sweeping no-parking ordinance for the downtown section. Now, unfortunately, it is necessary partially to retract the words of praise. For the City Fathers of the Pennsylvania metropolis have suffered a change of heart.

Startling charges have been registered against the no-parking ordinance by the Market Street and Arch Street Merchants' Associations and by certain organizations of motorists. Individual business men along Market Street, the principal shopping thoroughfare, declared that inroads have been made into their respective businesses, varying from 10 to 40 per cent. Some of the wealthier residents of the city have been heard to declare that they would rather have their chauffeurs drive them to New York, if necessary, so that they can park when and where they want to and for as long a time as they please!

When the original ordinance was passed Council voted unanimously to give the plan a fair trial. All objections by the merchants were temporarily stilled and it seemed that conditions were propitious for a valuable and revealing demonstration of the benefits accruing to the municipality and business men alike through relief from serious traffic congestion in the central delivery district.

But a wave of hysteria swept the merchants. Naturally many people who for years have been accustomed to use the city streets for free garage space set up a loud clamor against this "infringement" of their rights. Be it to the credit of Director of Public Safety Elliott that the ordinance was enforced fairly and impartially in practically every instance. So those who consider that they have an inalienable right to special privilege had their sense of the eternal fitness of things sadly wounded. Then, too, the no-parking ordinance was put into effect immediately following the holiday season. Business was naturally slack after the Christmas rush and many merchants unthinkingly placed the full responsibility for this condition at the door of the no-parking enforcement.

Violent agitation for a return to limited parking became the order of the day. The Committee on Public Safety was besieged with petitions and its public hearings were crowded with loud-speaking merchant representatives. Vainly did Director Elliott point out that limited parking was a physical impossibility without a considerable increase in the police force, that any weakening at this time meant a return to the old vice of the parking hog. Members of Council found it expedient to lend a sympathetic ear to the tearful tale of woe poured forth by the most prominent business men of the city. An amended ordinance was passed by the Council on March 24.

Those Who Defeated the Measure Will Find Themselves the Chief Losers

SO PHILADELPHIA is to have one-hour parking again on several important down-town streets. The boundaries of the restricted area have been moved in, so that parking is not to be prohibited over as wide a section as was first planned. True, the streets will presumably be swept clear during the morning and evening rush hours. But after 9:30 a.m. and before 5 p.m. it is to be feared that the old, old story will be told on Market, Arch and Broad Streets.

Back in their chairs the merchants will lean, with the comfortable feeling that they have scotched the transportation company and handily turned the tide in favor of themselves. But who have been the principal losers by this move? Who but the very merchants that have so persistently failed to look beyond the ends of their own noses? Every year more and more people have become disgusted with the intolerable congestion of traffic in the downtown area and have resolved to go to almost any lengths to avoid the mental and physical anguish incident to shopping in the center of the city. These people are ripe for picking by the neighborhood stores and the outlying shopping centers. Surely this class of shoppers constitutes a much bigger loss to the downtown merchants than the comparative few that have considered themselves injured by the recent legislation.

Relatively few shoppers can find, or ever could find, parking space for their automobiles on the narrow streets of downtown Philadelphia. Much of the limited space available is taken up by the clerk or other individual who usurps the space in front of the store in which he is employed—space which the store owner thinks is being used by his customers. Charles Hall, president of the Council, and Director Elliott have both predicted that it will not be long before the merchants wake up and realize that they have been deafened by their own oratory and confused by the false brilliance of their own theories of automobile shopping. Even now a large group of merchants have steadfastly refused to be carried away by the importunings of their fellows and have come right out in meeting with statements to the effect that strict no-parking enforcement is necessary and desirable. And the Automobile Club of Philadelphia has taken a similar stand.

As for Philadelphia, it started out bravely to move mountains and now wakes to find itself dealing in ant-hills.

Co-operation Will Bring Insurance Improvement

WORK which has been done over a period of several years by the insurance committee of the American Electric Railway Association typifies the character of activity in which an association committee can bring about material savings for members by acting as a clearing house for the interchange of data and experience.

Co-operation by member companies is essential to the success of such a committee's work. Of necessity it is dependent for its studies on information furnished by operating companies in answer to its inquiries. Unless such inquiries are answered completely, work of the committee is seriously curtailed.

This year the insurance committee is broadening its activity. It is not only interested in gathering fire loss statistics, so as to check up insurance rates directly, but is likewise endeavoring to stimulate the adoption by member companies of approved fire prevention measures which will reduce the fire hazard.

Questionnaires which were sent out some time ago are being compiled. The information developed is to be presented in the committee's report. This may be made complete or incomplete, depending on the degree to which operating companies furnish the necessary data. In order that the work of the committee may be the means for bringing about substantial improvement in the insurance situation, operating companies which have not answered the questionnaire will render a service both to the industry and themselves by sending in at once the information requested.

Appreciative Newspaper Comment Is Valuable to Railway Companies

SYMPATHETIC understanding of the problems of the electric railways is by no means uncommon among the daily press. This, of course, excludes from the list of commentators papers that never have anything but an axe to grind. The influence of such sheets will always be a subject of speculation, but there can be no question about the power for good of the best of the dailies. So in saying as it did, in a recent case in which fares were increased in an Eastern city, that the commission recognized a transportation and economic development familiar to every observing citizen in the present era of automobile competition, the paper in which this expression appeared put itself forcibly on record as recognizing this same condition.

The paper was not in full agreement with the schedule of rates authorized by the commission. It felt, for instance, that the short-haul rider had been penalized to the disadvantage of the company's revenues, but it did say in simple justice to the railway that "it has been struggling, like all other corporations of the same class, not only against tremendous difficulties, due to the automobile drain, but also against municipal exactions, in the way of taxation, that greatly handicap it in the resulting competition." There is no doubt that the paper did the city a real service in characterizing as fantastic the talk of enforcing the 5-cent fare condition of the original franchise grant. Of course, the courts have repeatedly ruled that, franchise or no franchise, electric railways cannot constitutionally be compelled to operate at a loss. It should be unnecessary to remind an intelligent community that the 5-cent fare was fixed in railway franchises at a time when operating costs, including wages, were radically different from what they are today, but it does seem necessary to repeat this truth again and again.

No sympathy was wasted by this commentator on the threat of retaliation against the local railway by the process of licensing buses to compete with the railway and "bring it to time." Very aptly it said, in substance, that, aside from the propriety of this kind of destructive revenge, its effect would be, not to restore 5, 6 or 7-cent fares, but to destroy railway service, the main reliance of the great bulk of the people. In that event the city would have to forfeit hundreds of thousands of dollars a year in franchise taxes and paving taxes or transfer the equivalent of these assessments to the bus companies. And the paper clearly sees that, in either event, the public would have nothing to show but a melancholy deprivation of railway facilities for its foolish experiment in municipal vengeance.

In thus ably presenting the case in its two editorials the commentator has done a real service to city officials, the public and the railway. No thoughtful, far-seeing citizen desires to cripple the corporate agency that furnishes to the city a considerable part of its daily transportation. On the contrary, that agency, having demonstrated its desire to carry on, must be sustained in every reasonable way. On its part, the city has the right to demand in return fair play to patrons, together with a demonstration by the railway of its sincerity in providing the highest grade of service that is possible under the particular economic limitations imposed.

Safety Co-operation from the Top

WITH respect to the all-important subject of safety and accident prevention work, a new note is sounded in a recent article by A. W. Robertson, president of the Philadelphia Company, writing in the N.E.L.A. *Bulletin*. He says in part:

"In order to get the most out of safety devices and wise safety rules, it is absolutely essential that the individual be protected and that his co-workers and companions have the right mental attitude toward both of these and all other matters pertaining to safety. If the mental attitude is wrong, it is quite possible to almost defeat the effectiveness of both. Safety devices will compensate in some measure for faulty rules and appliances. Here is where the executive can help very materially. If he has no interest in safety, the chances are he will affect his immediate subordinate officers and they, in turn, will affect those directly under them to have a contempt and disregard for safety work. This attitude tends to put the brakes on every safety movement in the organization, although the subordinate may have ample safety devices installed and adequate rules promulgated."

With this approach to the safety problem, Mr. Robertson has unearthed one of the greatest stumbling blocks to a perfect safety organization. In a few words, he promulgates the axiom that pressure from the top is much more effective than pressure from the bottom. Also that pressure from the top and from the bottom exerted at the same time will eradicate any faults that may lie in the middle of the pile. The whole history of the safety movement is justification of the assertion that executive indifference has retarded and devitalized some of the best plans and most enthusiastic efforts for the conservation of human life in the industrial world.

Speaking very plainly, the JOURNAL has had the opportunity to see the effects of this executive indifference, or, what is worse, a mild display of enthusiasm that is a shadow instead of a substance. Those familiar with the safety movement will undoubtedly agree that accident statistics decrease in direct proportion to the percentage of workers, from president to office boy, that are sold on the movement.

A Railway Operator Speaks Frankly

FRANK, indeed, were the remarks made before the recent meeting of the Illinois Electric Railway Association at Springfield, Ill., by J. R. Blackhall, vice-president and general manager Chicago & Joliet Electric Railway, regarding the manufacturers' responsibility for keeping abreast of the industry's present-day equipment needs. Some there may be who feel that Mr. Blackhall was unduly severe in his criticism, or at least neglected to give adequate credit for those improvements which have been made in electric railway equipment. Others might be inclined to hold that the speaker had overlooked the effect on car development of the buying habits of many operating companies. In this latter category would come the practice of buying cars to detailed specifications and the strong resistance encountered by manufacturers in the introduction of new devices.

But whether or not Mr. Blackhall recognized adequately the difficulties encountered by the car builders, the question of how to bring about car improvement merits more than passing consideration on the part of both manufacturers and operators. Electric railway equipment must be brought up to a level of attractiveness and performance that will meet present-day transportation standards, and the speed with which the industry may be expected to move forward into its proper place in the sun depends on the extent to which this is accomplished. It is indeed "a condition and not a theory that confronts us."

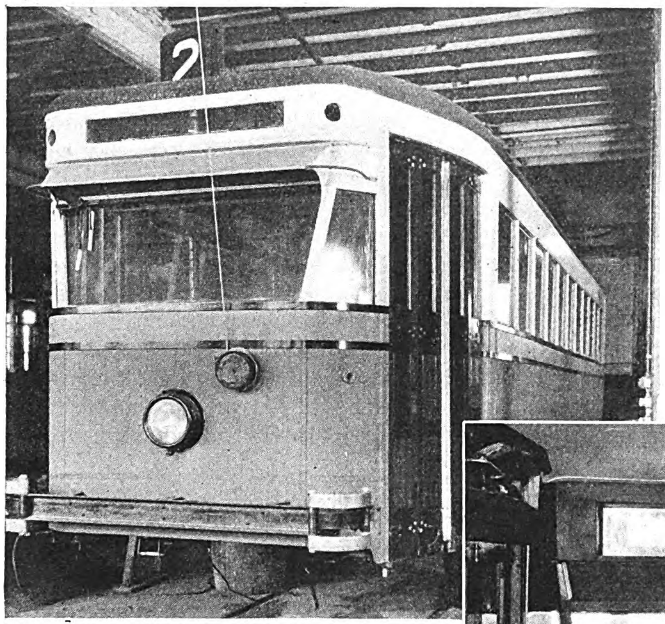
Just what is needed in the way of car improvements cannot be definitely cataloged. It would likewise be an ambitious undertaking to attempt to predict just what will form the developments of the next few years. But it is a simple matter to list the characteristics that are wanted in the car of the future. It must be faster; it must be more attractive to the eye and more comfortable to ride. Reduction of noise in operation is absolutely essential. It seems quite probable that this last requirement will lead to some fundamental changes in design. In fact, several interesting attempts to work out improvements in this direction are already under way. It was his own experience in the development of a truck with fully inclosed gears and spring suspended motors that led Mr. Blackhall to question the initiative of the car builders.

Frank discussion of a question so vitally important to the industry is decidedly helpful. Each day there is a growing inclination on the part of every one concerned to face the facts and to abandon the shackles of precedent and prejudice. The ultimate electric railway car will not be developed overnight. Mere changes do not necessarily constitute improvements. Failures and mistakes may be expected. In some cases the importance of making adequate provision for economical and rapid maintenance and repairs may be overlooked. But there seems to be no good reason why electric railway cars cannot be made as attractive to the public as any other vehicle on the streets. In fact, in comparison with the problems with which the bus designer must contend, the car builder's task is relatively simple.

Fundamental Design Changes

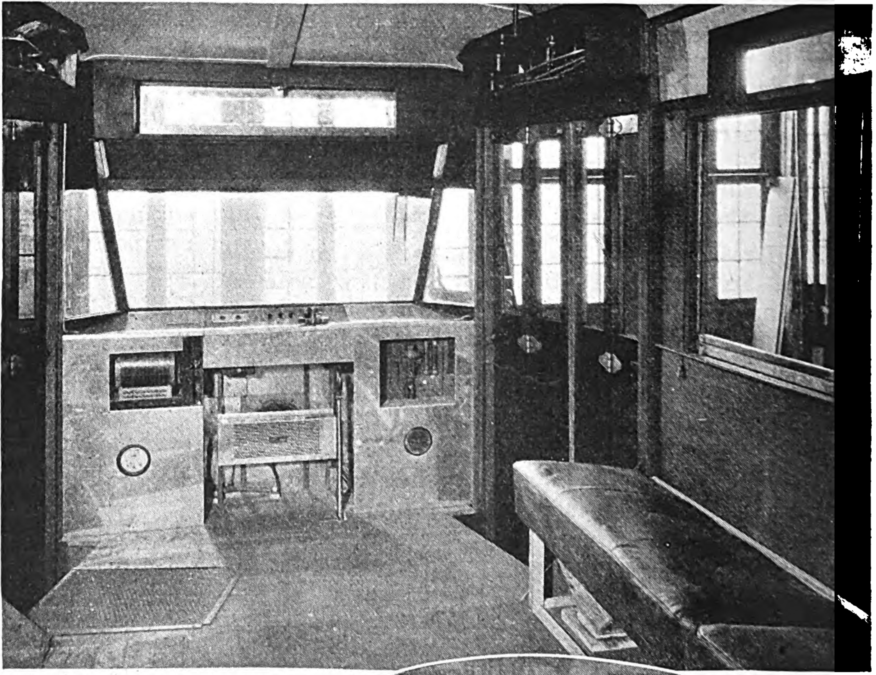
Feature Experimental Car at Springfield, Mass.

Inclosed Worm Drive from Four High-Speed Motors Mounted on Truck Frames, Tapered Roller Bearings and Internal Expanding Brakes Are Expected to Reduce Noise and Vibration—Combination Wood and Duralumin Streamline Body Has Rakish Appearance



Exterior lines of Springfield experimental car show many traces of motor bus influence

Compound curves have been used freely to create a pleasing appearance. The wide sloping windshield is an innovation in street car design. Doors will be painted to conform to general color scheme.

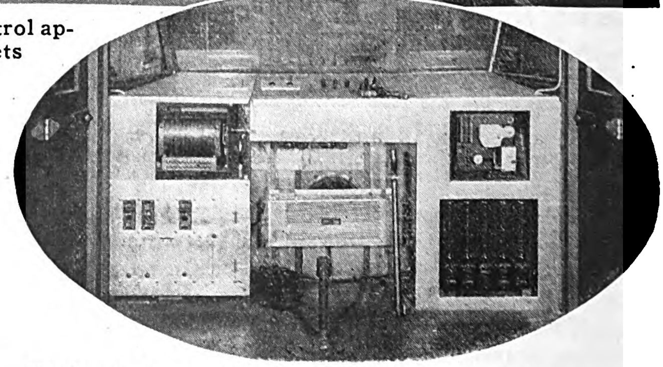


All switches and control apparatus are in cabinets at ends of car

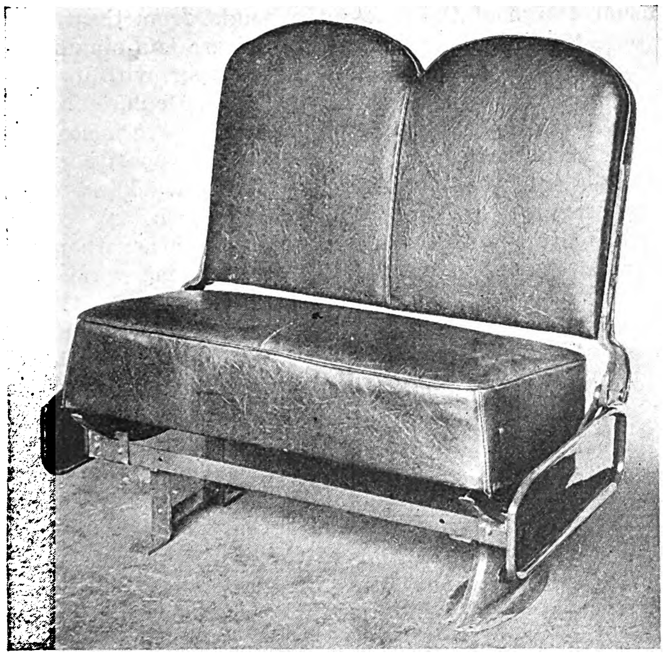
Air piping on the platform has been replaced by electric wiring. Covers are removed in this and other views shown. Treadle step is seen at the left. Floor will be covered with linoleum.

PRECEDENT has been cast aside in the design of a new car by the Springfield Street Railway, Springfield, Mass., and a vehicle has been developed which differs in many important respects from any hitherto operated by electric railways in this country. The object has been to build a car lighter, faster and more comfortable than those now in use. The outward appearance of this new car is novel, but not so much so as the design and arrangement of the equipment. This has been accomplished not by camouflaging an old design but by adopting an entirely new one. Many ideas borrowed from the automobile industry have been incorporated. Special effort has been made to reduce noise and vibration. To this end radical departures have been made from established practice in truck design. The practicability of the many innovations will be thoroughly tried out in a series of tests.

The idea of building a car radically different from any previously operated was conceived several years ago by Clark V. Wood, president Springfield Street Railway and Worcester Consolidated Street Railway. Because comparatively few major changes had been made in street car design in many years, he believed that this vehicle had come to be considered by the public as antiquated. The tremendous increase in the use of automobiles had accustomed people to many refinements not incorporated in the usual type of street car. He determined, therefore, to undertake the construc-



Handle of the master controller with horizontal drum, seen at the left, moves in a vertical plane. Automobile type lever at right is for emergency braking. The post in the foreground supports the operator's seat.



The deep-cushioned seats are upholstered in dark brown Spanish leather

tion of a car that would be far in advance of present practice. The work of designing the vehicle was intrusted to W. L. Harwood, engineer of power and equipment for the Springfield and Worcester railways.

After careful consideration of the problem, it was decided that efforts should be directed particularly toward reducing noise and vibration and toward giving the car an attractive appearance. It was thought that the journal bearings should be of the so-called frictionless type, which would be possible if the motors were spring supported instead of being dead weights on the axles. Gears should be of a design that would cut down noise and permit the use of higher speed motors. Brakes should be of the internal expanding type, eliminating the rattle of levers and rods. Interior fittings, seats, lighting, etc., should be made more attractive. In place of a bell or whistle, the car should be equipped with a warning signal having a more agreeable sound.

NOVEL FEATURES IN TRUCK DESIGN

Numerous unusual features have been embodied in the truck design. Dished steel wheels of 26-in. diameter are mounted on differential axles of the automobile type, which revolve on tapered roller bearings arranged as shown in an accompanying drawing. The truck is of steel with I-beam side frames inside the wheels. The wheelbase is 6 ft. Coil bolster springs carry the weight of the car body up to three-quarters of the seated load. In addition semi-elliptic springs mounted in seats provided with Mack rubber shock insulators are in use at all times. This truck design is a joint development of the Wason Manufacturing Company, the Timken-Detroit Axle Company and the Springfield Street Railway.

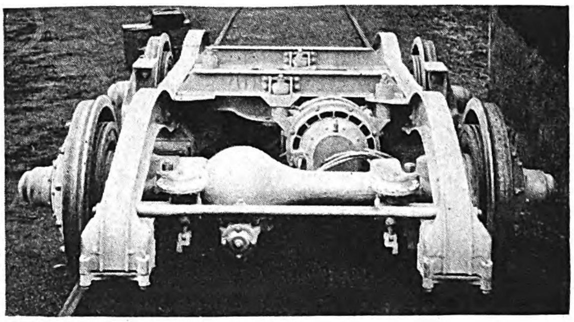
Each of the trucks carries two Westinghouse V91B, 300-volt motors, connected permanently in series. Variation in speed is obtained by placing the pairs in series and in parallel. Each motor is attached through rubber blocks to the truck frame with its shaft parallel to the direction of motion of the car. It is connected to the remote axle of the truck through a flexible Spicer propeller shaft. The gear reduction is 10 to 1, permitting the use of small high-speed motors, weighing 424 lb. each. The worm drive operates in a bath of oil. Universal joints between the motor and the axle permit placing the motors well up on the truck frame, where they will be out of the way of water, snow and slush.

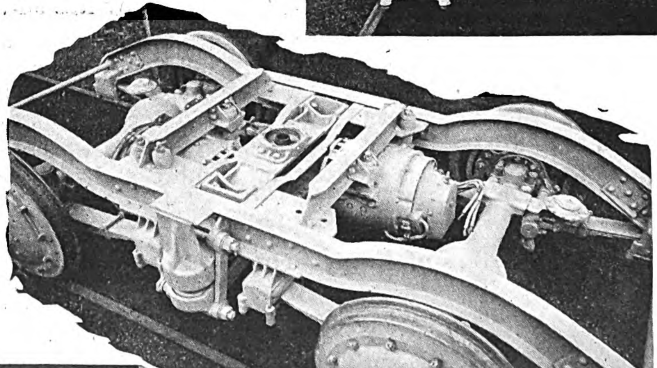
Brakes are of the internal expanding type similar to those developed for buses. They were designed by the Westinghouse Traction Brake Company. Composition inserts used as shoes were made specially by the American Brake Shoe Foundry Company. An accompanying illustration shows the brake mechanism.

This truck weighs only 5,650 lb. complete with motors and drive shaft. Scale weights of various parts are given in an accompanying table. The combination of the light weight and friction reducing features make it possible for a man easily to push the complete truck with one hand along the track.

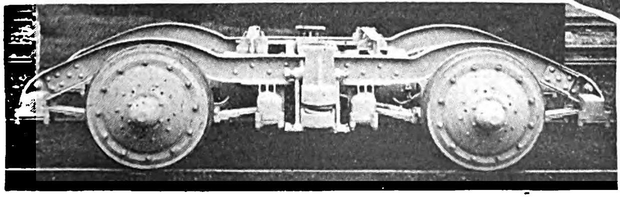
CAR BODY HAS RAKISH LOOK

Many novel features have been incorporated in the car body, which has been built by the Wason Manufacturing Company. Underframing is of steel with duralumin bolsters. The weight of each bolster is 101½ lb. It is interesting to note that this is less than the weight of



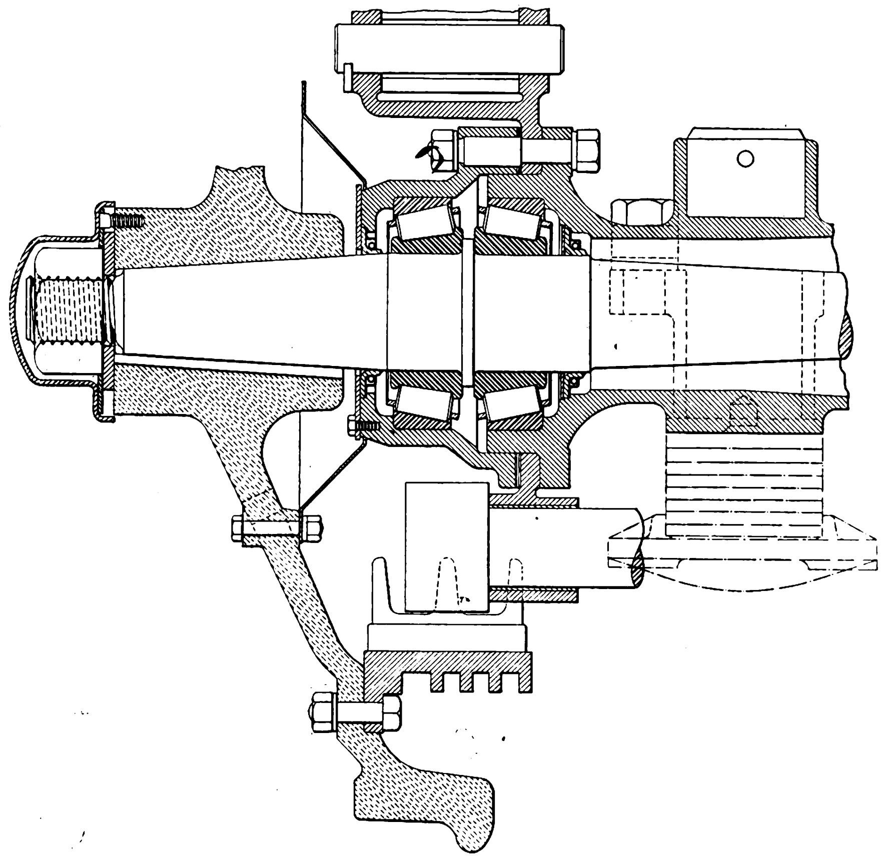


Unsprung weight is reduced by mounting high-speed motors on the truck frame and connecting them to the remote worm-drive axles through flexible propeller shafts. Brakes of the internal expanding type are located inside each wheel.



Worm-drive roller-bearing truck developed for experimental car the trolley base used on the car. By using duralumin a saving of 400 lb. was effected without reducing the safety factor. Window posts are of wood reinforced below the belt rail with duralumin angles. The sheathing below the belt rail consists of plates of sheet aluminum held in place by battens. These plates curve inward slightly at the bottom, giving an appearance similar to that of a bus body, and extend 8 in. below the underframe, forming an apron which conceals the greater part of the equipment and running gear.

Length over corner posts is 30 ft. and 40 ft. 8 in. over all. Width over belt rails is 8 ft. 4 in. Truck centers are 19 ft. 6 in. apart. The platforms are curved between the body corner posts and the end, which is straight for a distance of 4 ft. 8 in. Duralumin is used also for the letterboard and belt rail. Altogether 735 lb. of this metal is employed for the side members, letterboards, bolster, etc. Carlines are of steel and wood, while the roof is of tongued and grooved $\frac{3}{16}$-in. cedar covered with No. 8 canvas.



The 26-in. rolled steel wheel in dished to bring the throat vertically in line with the tapered roller bearings

Due to the use of small diameter wheels and the unusual design of the trucks the height from the rail to the car floor is only 2 ft. 8$\frac{3}{4}$ in. There is a single well step between the ground and the car floor, with its edge curved to conform to the body lines. Double outward folding doors conforming to the same curve inclose the four step wells. At two diagonally opposite doors, treadle steps are provided for rear exit. These doors are provided with street collector's control.

A feature which suggests the bus rather than the typical street car is a plate glass sloping windshield 56 in. wide. This has the practical advantage that it eliminates reflections from the interior lights of the car. An electric windshield wiper is provided. Above the windshield is a sloping sun shade. Under this is a hinged ventilator which may be raised to admit air. An automobile type bumper has been placed at a height of 24 in. above the ground.

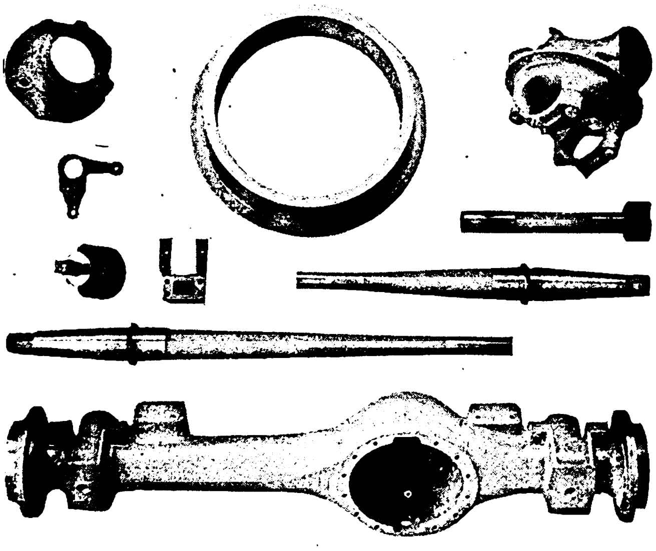
Special attention has been given to the lines of the roof, which resembles that of a high-grade automobile. The inside height from floor to ceiling is only 7 ft. 2 in. This makes possible the small over-all height of 10 ft. 2 in. from rail to top of roof. All exterior lines are continuous from end to end of the car body. The color scheme is yellow below the belt rail and cream from the window sills to the roof. A red band 8 in. wide completely encircles the car immediately below the window sills. Outside the doors have been painted with bands of color to conform to the general scheme.

Seats are provided for 45 passengers. There are sixteen pairs of cross seats, spaced 31 in. apart, and four longitudinal seats at the ends accommodating three passengers each. Two revolving seats with backs are provided in the center of the platforms. The forward one is for the operator and the other is available for passengers. All seats are deep cushioned and covered with dark brown Spanish leather.

Windows have Rex single drop sash. The floor is a single layer of wood covered with brown inlaid linoleum. Illumination is furnished by five 94-watt dome lamps with a compensating panel, located in the platform cabinet. Ventilators are of the bus type, located in the roof. Chromolux electric heaters are used with thermostatic control. The interior of the car has been given a pleasing appearance by carrying the white Agasote headlinings straight through, unbroken by bulkheads. Below the window sills the sides

List of Manufacturers of Equipment Used on Springfield Experimental Car

Air brakes	Westinghouse Traction Brake Company
Air compressor	General Electric Company
Axles	Timken-Detroit Axle Company
Brake shoes	American Brake Shoe & Foundry Company
Car signal system	Electric Service Supplies Company
Control	Westinghouse Electric & Manufacturing Company
Destination signs	Electric Service Supplies Company
Door mechanism	National Pneumatic Company
Electric horn	American Bosch Magneto Company
Energy-saving device	Economy Electric Devices Company and Wm. Arthur
Gears	Timken-Detroit Axle Company
Heaters	Railway Utility Company
Headlining	Pantasote Company
Interior trim	Haskelite Manufacturing Corporation
Journal bearings	Timken Roller Bearing Company
Lamp fixtures	Electric Service Supplies Company
Motors	Westinghouse Electric & Manufacturing Company
Sash fixtures	Curtain Supply Company
Seats	J. G. Brill Company
Seating material	Blanchard Brothers & Lane
Shock absorbers	Mack Trucks, Inc.
Trolley catchers	Wilson & Company
Trolley base	R. D. Nuttall Company
Trucks	Wason Manufacturing Company
Ventilators	Nichols-Lintern Company
Universal joints	Spicer Manufacturing Corporation
Wheels	Standard Steel Works Company



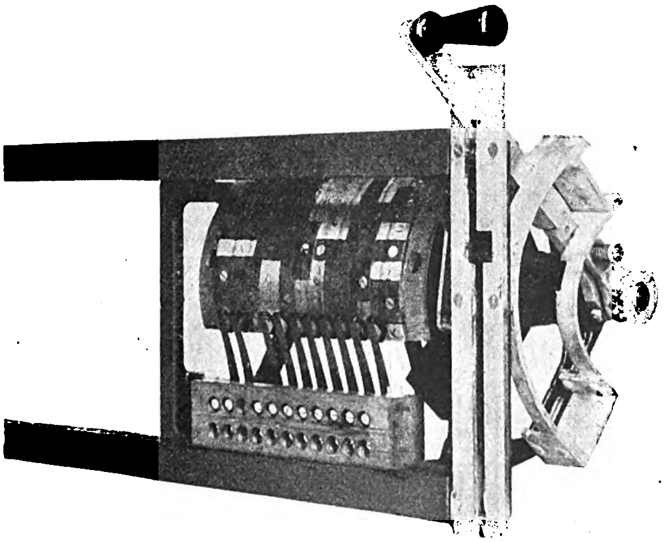
Differential axle and housing before assembly

are of mahogany-faced Haskelite, while brown imitation leather is used above. There are no bell cords or register rods. Faraday buzzers are provided. A two-toned electric horn is used in place of a warning gong.

ELECTRICAL EQUIPMENT IS UNUSUAL

Care has been exercised in locating the equipment and the old method of placing switches, thermostats, relays, etc., here and there throughout the car has been abandoned. In front of the operator is a cowl with two panels somewhat resembling a small desk. Switches, light relays, indicating lamps, pressure gage, controller, brake handle, etc., are all mounted flush in these panels. The operator has full control of the car and all apparatus while in his seat.

Remote control of motors is employed. On the platform a master controller operated at 24 volts actuates the main switches under the car body. This master controller is an adaptation of a type of electric vehicle control. The drum is mounted on a horizontal axis, as shown in an accompanying illustration, so that the handle moves in a vertical plane. Energy for the master controller is obtained from two U.S.L. 12-volt storage batteries, series connected. These batteries are charged by being in series with the car lamps and the air compressor. Energy is furnished from the same source for the tail lights, so that oil lamps are not required. It is estimated that the saving in this item alone will practically pay for the use of the battery.

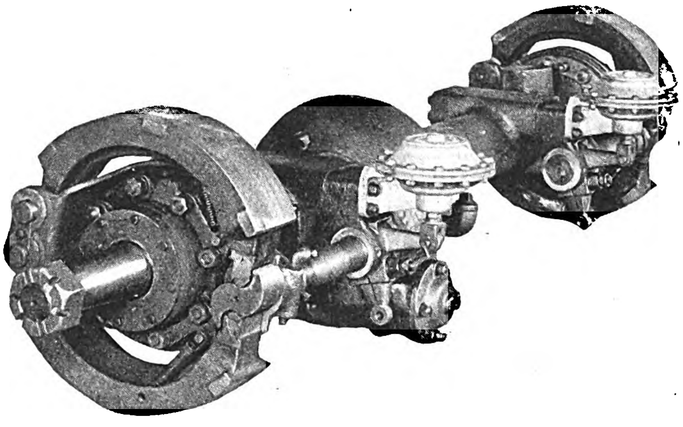


Master 24-volt controller with horizontal drum and handle which moves in a vertical plane is located in platform cabinet

REMOTE ELECTRIC CONTROL IS USED FOR BRAKES AND DOOR ENGINES

Air brakes and doors have remote control. The operator's brake handle merely establishes various electrical contacts which actuate magnet valves which are located under the longitudinal seats and above the doors. Thus the only pipe on the platform is that for the gage. The pneumatic door engines are of the light-weight type made by the National Pneumatic Company. With this type of door engine and the bus-type braking mechanism it is possible to use a General Electric CP-25-C8 air compressor of 10 cu.ft. capacity. In the compressor aluminum castings have replaced iron to lessen the weight. Flexible aluminum tubing with brass automobile type fittings is used for all the air piping.

The emergency brake mechanism is operated by a hand lever of the type used on automobiles. The lever at each end operates only on the adjacent truck. Connection between the lever and the cam by which the brake shoes are brought into play is through wire cables. This arrangement eliminates all chains and rods which might be a source of noise.



Movement of the camshaft causes brakeshoes of composition bronze to press against the drum within the wheel

Due to the light weight of the motors and the extensive use of duralumin throughout the body, the total weight has been kept down to 23,450 lb. It is expected that this will permit rapid acceleration and braking. The weight is divided between the various parts of the car body and trucks as shown in the accompanying table.

NEW FEATURES, IF SUCCESSFUL, WILL BE INCORPORATED IN FUTURE CARS

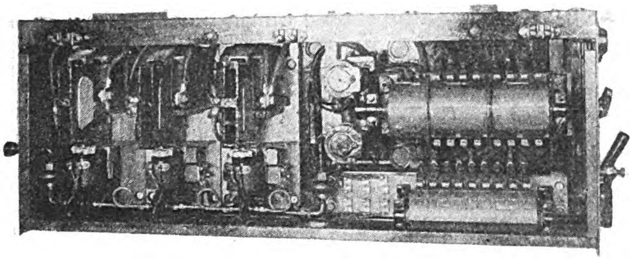
Work has been finished on the trucks and only a few minor details remain to be completed on the car body. It is planned to assemble the body and trucks at an early date and test the operation of the car. The management is hopeful that many of the innovations embodied in this design will turn out to be real improvements, but considers the car at this stage to be entirely an experiment. After thorough testing, if the new features prove to be as advantageous as expected, they will be adopted and

DETAIL WEIGHTS OF SPRINGFIELD WORM-DRIVE CAR

	Pounds	Pounds
Body	7,800	
Seats	1,750	
Floor covering	200	
Heaters	300	
Electrical equipment	600	
Air brake equipment	1,000	
Miscellaneous	500	
Total body		12,150
Two motors, 424 lb. each	848	
Two axle assemblies, 1,550 lb. each	3,100	
Frame	1,622	
Shafts and joints	80	
Total, each truck	5,650	
Total, two trucks		11,300
Weight, complete		23,450

incorporated in the design of future cars. It is anticipated that under conditions of quantity production cars of this type could be built at approximately the same cost as that of the light-weight, double-truck car of the ordinary type.

It is planned to make complete tests of the car, using special apparatus where possible to determine the comparison of the new type with existing equipment. The instrument developed by the committee on noise reduction of the American Electric Railway Engineering Association will be employed to measure the noise. Following these special tests it is planned to place the car in service on one of the lines of the Springfield property and make service tests for a period of from six months to a year in order to determine whether any of the features require modification before the design is acceptable for use.



Switch group located under car body

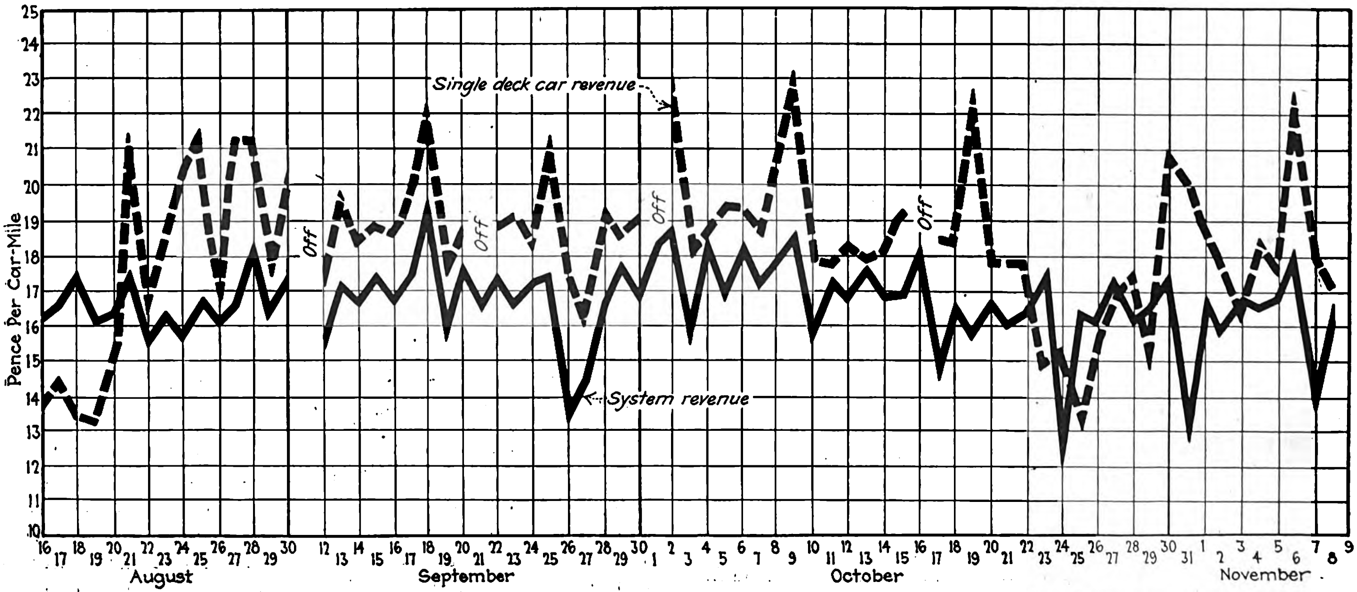
Total Dividend of St. Louis Loan Association $843,708

At a recent meeting of the board of directors of the United Railways Savings and Loan Association, St. Louis, Mo., the 23d consecutive semi-annual dividend was declared at the rate of 6 per cent per annum, payable to members of record Aug. 31. The dividend will total $99,000. It brings the grand total paid to members of the association to $843,708. The association has never paid less than 6 per cent dividends, compounded semi-annually, and has paid a dividend every six months. The association has placed 2,009 members in homes of their own. It now has 5,798 members. It was founded to encourage home owning and stimulate thrift.

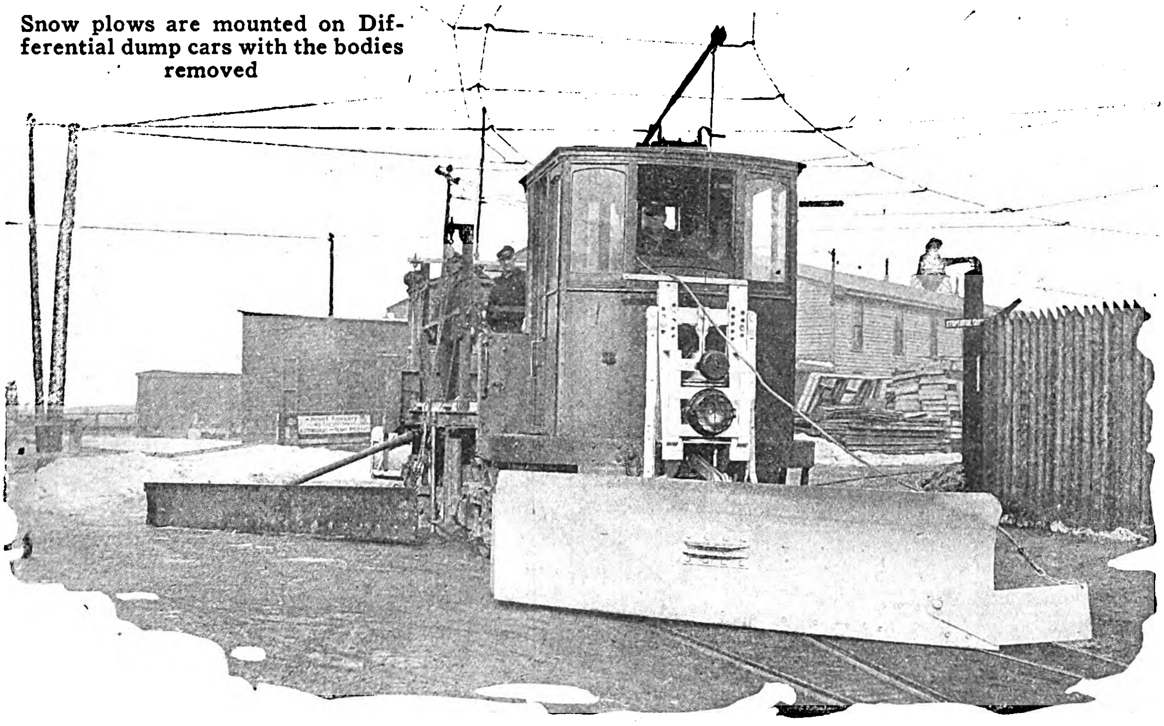
Glasgow Single-Deck Car Popular but Not Economical

Experience of several months with an experimental single-deck car designed by the Glasgow Corporation Tramways, Glasgow, Scotland, somewhat along American lines, has led the management to the conclusion that such a vehicle is not well suited to the transportation needs of that city. While this car has proved quite popular with the riding public, its comparatively small seating capacity has been a disadvantage, especially during rush hours. Details concerning the construction of this car appeared in ELECTRIC RAILWAY JOURNAL, Oct. 23, 1926, page 769.

A measure of the relative popularity of the single-deck vehicle and the double-deck tram long standard on the Glasgow system is had by comparing the revenue per mile of the new equipment and that of the entire system. Earnings have been consistently higher for the single-deck car, as shown by the accompanying chart. During 70 days of operation in August, September, October and November of last year, the revenue per car-mile averaged 18.2 pence for the single-deck car and 16.7 pence for the system as a whole. It is believed that these higher earnings may be due to the more attractive appearance of the new car, and to the use of transverse upholstered seats instead of longitudinal seats of wood. These features, of course, could be embodied equally well in a double-deck car.



Revenue per car-mile with single-deck equipment compared to revenue for the entire Glasgow system shows the popularity of the new car



Snow plows are mounted on Differential dump cars with the bodies removed

Snow-Fighting Methods Revolutionized

By H. M. Steward

Superintendent of Maintenance Boston Elevated Railway

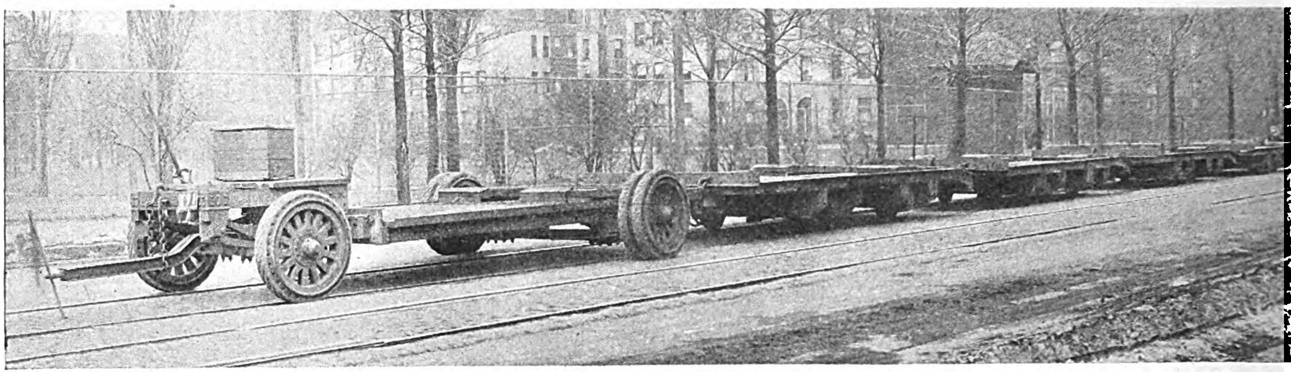
Boston Elevated Railway Now Plows Snow from Tracks and Roadway, Finding It Pays Well to Keep a Vehicle Road Open to Prevent Blocking Car Tracks

DUE to the changes in traffic conditions which have occurred in recent years; that is, the substitution of motor vehicles for practically all horse-drawn vehicles and the use of motor vehicles, particularly pleasure cars, throughout the year, the Boston Elevated Railway has found it necessary to readjust its method of handling snow.

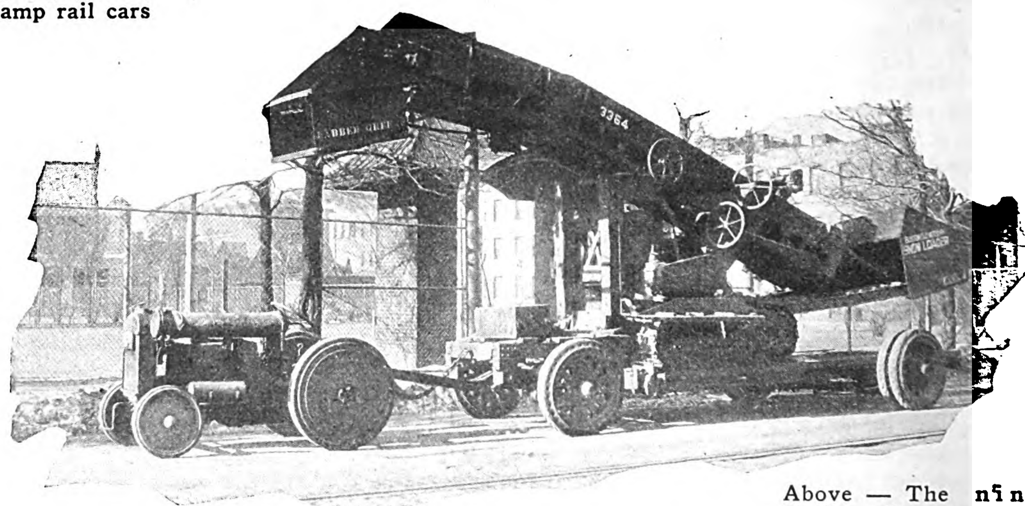
Formerly the railway plowed the snow from its tracks to provide a clear roadway for the operation of its cars, without being obliged to consider the roadway alongside. In fact, several of the municipalities desired that a certain amount of snow be left on the roadways in order that vehicles on runners could be operated without trouble. During this period, on streets where business would not permit the snow plowed from the tracks to remain, it was necessary for the railway to remove it.

The present method is to plow the tracks with the various types of electric car plows or sweepers, as before. As soon, however, as the snow at the end of the plow or sweeper wings reaches a depth of approximately 12 in. motor vehicles equipped with plows or shears are used to push the snow back further. This operation continues throughout the duration of the storm. On the first night following a snowstorm nine cars equipped with long steel wings come into play for the purpose of pushing the snow back to the curb. If certain streets are too wide for the wings of these cars to reach to approximately the curb, the snow is pushed back to the desired point by motor vehicles working in conjunction with the winged cars. This method of handling the snow provides a roadway for practically the full width of the street, which allows all vehicular traffic to use the entire roadway and does not make it necessary for vehicles to run in the track area only.

This method of handling the snow also removes almost entirely the menace of high ice which formerly existed, and consequently reduces the expense of car maintenance, prevents delays and materially reduces accidents due to vehicles slipping on the ice and sidewiping cars. During the heavy snowfall in the winter of 1919-20, when the tracks only were cleared, ice several inches in depth formed in the track and deep ruts occurred, due to the operation of motor and other vehicles. This resulted in severe losses to the railway on account of delays, repairs to cars, the expense of removing the ice and payment for accidents. By clearing the roadway for practically the full width of the street, the melted snow has an opportunity to run to the sides of the roads and thence to the gutters, instead of accumulating in the track, as it did formerly. It must be understood, of course, that it is necessary to use care and to remove the snow thoroughly from around hydrants and to open catch basins in the gutters. Snow must also be removed promptly from driveways to garages, business houses, gasoline stations, public buildings, etc. The extra expense, if any, of pushing back

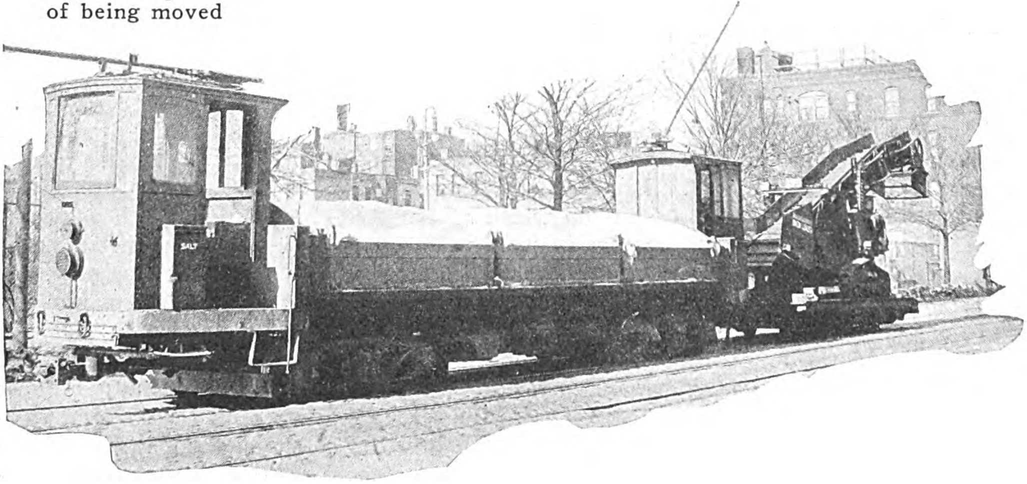


The company has an auto trailer that is useful in transporting equipment, and a fleet of four low ramp rail cars

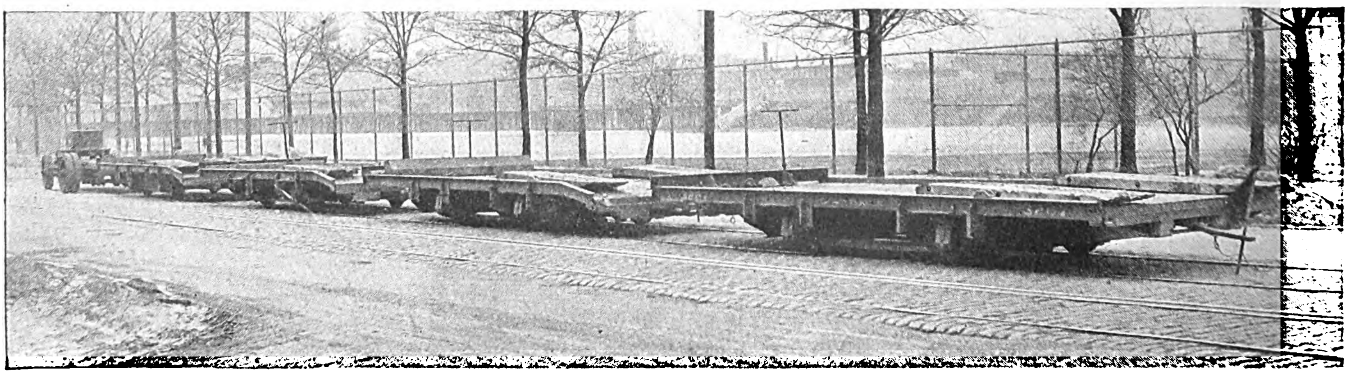


Above — The nine Barber-Greene snow loaders are transported from place to place by several methods. The one shown is on an auto trailer being hauled by a Fordson tractor

Below—Differential dump cars are used for pulling the ramp cars. A snow loader is shown in process of being moved

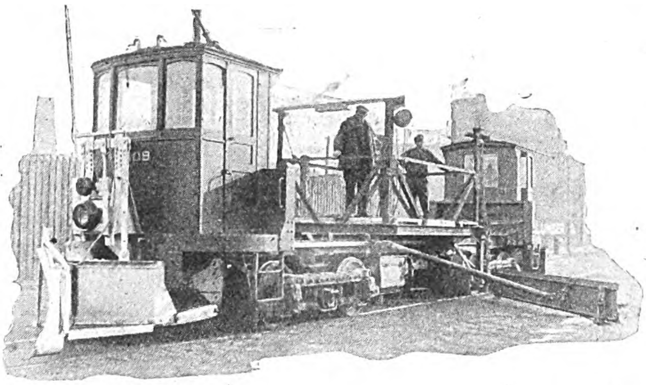


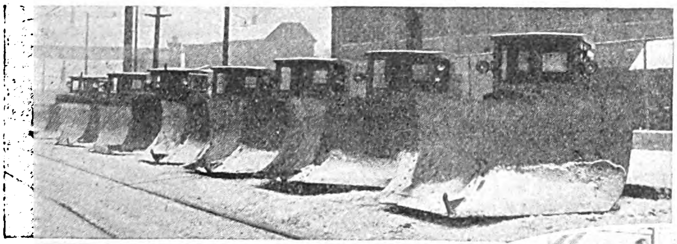
A close-up view of the ramp cars, showing their construction

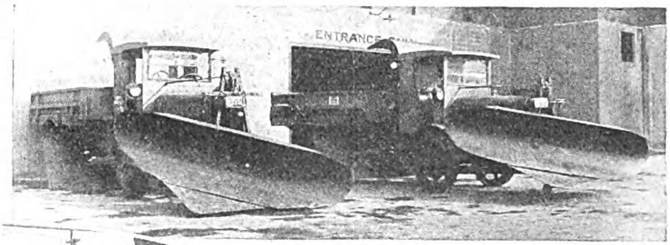


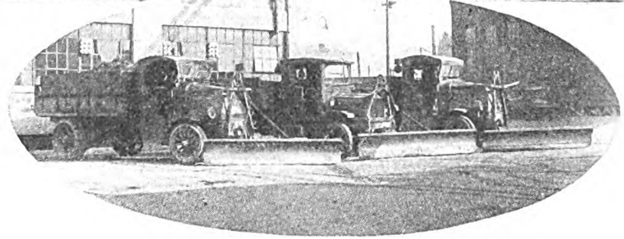
the snow for practically the full width of the street is probably more than offset by the saving resulting in lessened damage to cars, delays to traffic and accidents. During snowstorms, when all our plows and sweepers are in use, we have employed up to 22 trucks equipped with plows or shears, together with seven tractors, three Walter snow fighters and one FWD truck.

During snowstorms vehicles are liable to break down on the track area and prevent the operation of cars. To supplement the emergency equipment, which is sufficient during the summer months, it has been found advisable to use trucks equipped with jacks, block and tackle, towing ropes, picks, shovels, etc., stationed at strategic points with two experienced men, besides the driver, as a crew. These trucks are used only while the snow is falling or until the streets are opened for traffic. During snowstorms we have used up to eleven extra emergency trucks of this sort.









Top — Substantial outboard plows clear the roadway alongside the railway tracks

At left—This fleet of 5-ton tractors equipped with V plows has proved excellent for snow fighting in Boston

Above — Two of the three Walter snow fighters which have been used with good results on the Boston Elevated Railway

In oval—Three of a group of 44 trucks equipped with Champion snow plows

On bus routes it is also necessary to plow the snow and during snowstorms up to 29 trucks equipped with shears have been used. After the storm is over the bus routes are plowed to practically the full width of the street and down to the pavement where possible. This is accomplished by using Walter snow fighters which are equipped with scrapers located between the front and rear wheels. If the snow is not plowed down practically to the pavement, the roadways soon become rough and bumpy, with resulting severe damage to the buses.

The railway, in the development of its snow-fighting system, has accumulated a wide range of equipment, most of which has been found quite essential under present-day conditions. It includes the following:

- 9 Barber-Greene snow loaders.
- 4 trail cars.
- 1 motor trailer.
- 7 tractors.
- 3 Walter snow fighters.
- 1 Four-Wheel-Drive truck.
- 44 trucks equipped with shears.
- 6 Differential cars equipped with plows and wings.
- 3 rail cars equipped with wings.

Accompanying illustrations show some of this apparatus.

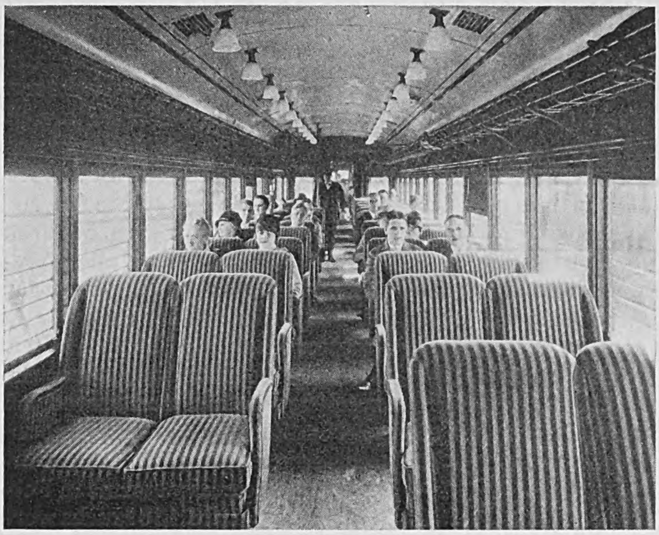
The railway owns seven 5-ton trucks which are used to plow snow and in addition owns 37 shears for trucks which are used on trucks hired from contractors. Arrangements are made with high-class contractors in the late summer to furnish trucks for plowing and for hauling snow. A list of contractors desiring this work is prepared and suitable arrangements are made for calling and responding promptly. Trucks to be used for plowing are required when a heavy snowfall is predicted and soon after snow begins to fall. In order to speed up the work, the trucks are sent to the railway shops at four different locations and the shears are put in place. After the plowing work has been done, the shears are removed, inspected, repaired and stored, all ready for the next storm. No difficulty has been encountered in securing the necessary number of trucks. During the heavy storms in February, 1926, 130 trucks were readily secured for plowing and removing the snow.

Formerly it was the practice to load snow, to be removed by hand, into sleds or other vehicles drawn by horses. These horse-drawn vehicles were then hauled to convenient dumps and the load was removed by hand.

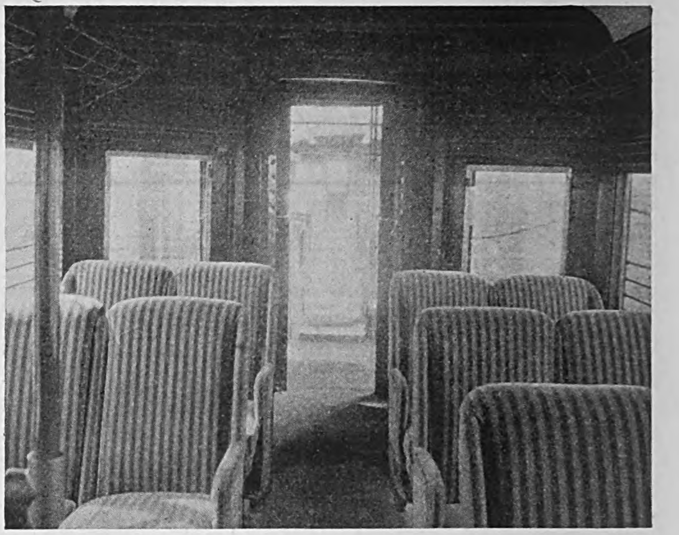
The present method consists of pushing the snow into long piles parallel with the curbs, picking up the snow and loading it into trucks with Barber-Greene snow loaders. The trucks used hold an average of 7 cu.yd. of snow and 60 seconds on the average is required to load a truck. By the proper selection of dumps, the round trip per truck does not exceed 30 minutes on the average. Seven trucks are sufficient to keep a snow loader in continuous operation, except where the dumps are located beyond the average distance.

The Boston Elevated Railway owns and operates nine snow loaders, which are taken to the locations where they are to be used on low trail cars or on motor trailers. A few of the cities and towns also own snow loaders. When all of the Boston Elevated Railway snow loaders are in operation it is necessary at times, depending upon the amount of snow to be handled, to use up to 100 trucks per day.

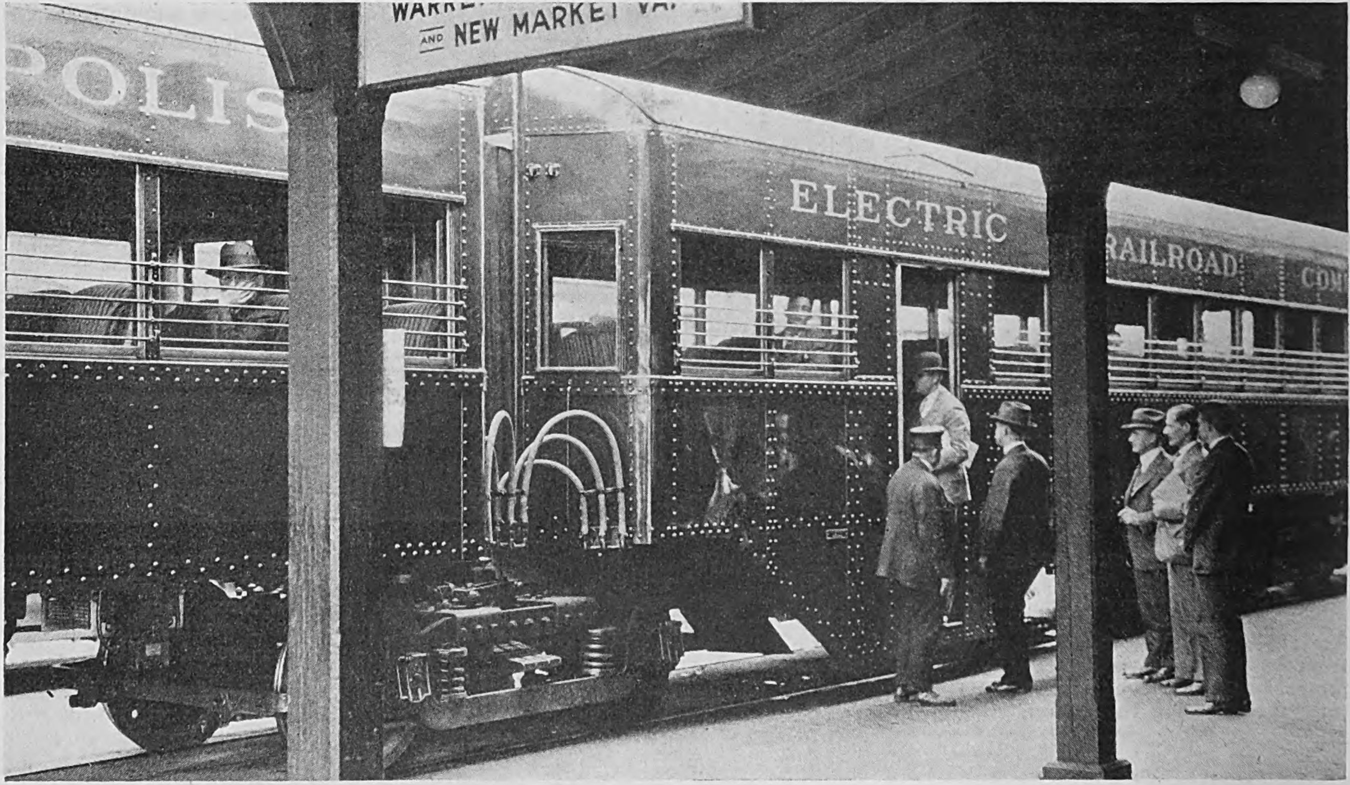
By means of snow loaders and trucks the snow which the railway is obligated to remove can be taken care of in a storm of, say, 12-in. fall in not over 36 hours.



One of the first service trips of the W., B. & A. articulated trains



Looking through the drum from one body to the next


WARRE
AND NEW MARKET VA.
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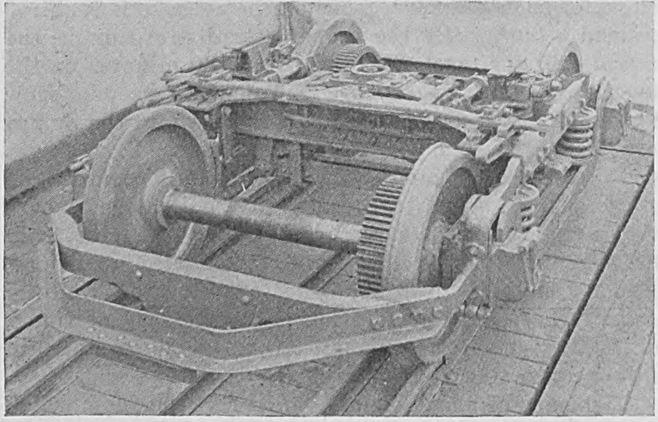
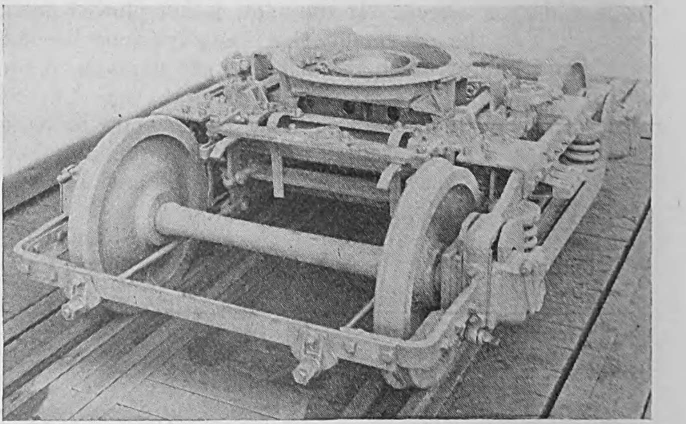
Passengers boarding one of the ten new articulated cars of the Washington, Baltimore & Annapolis line in the company's Washington terminal



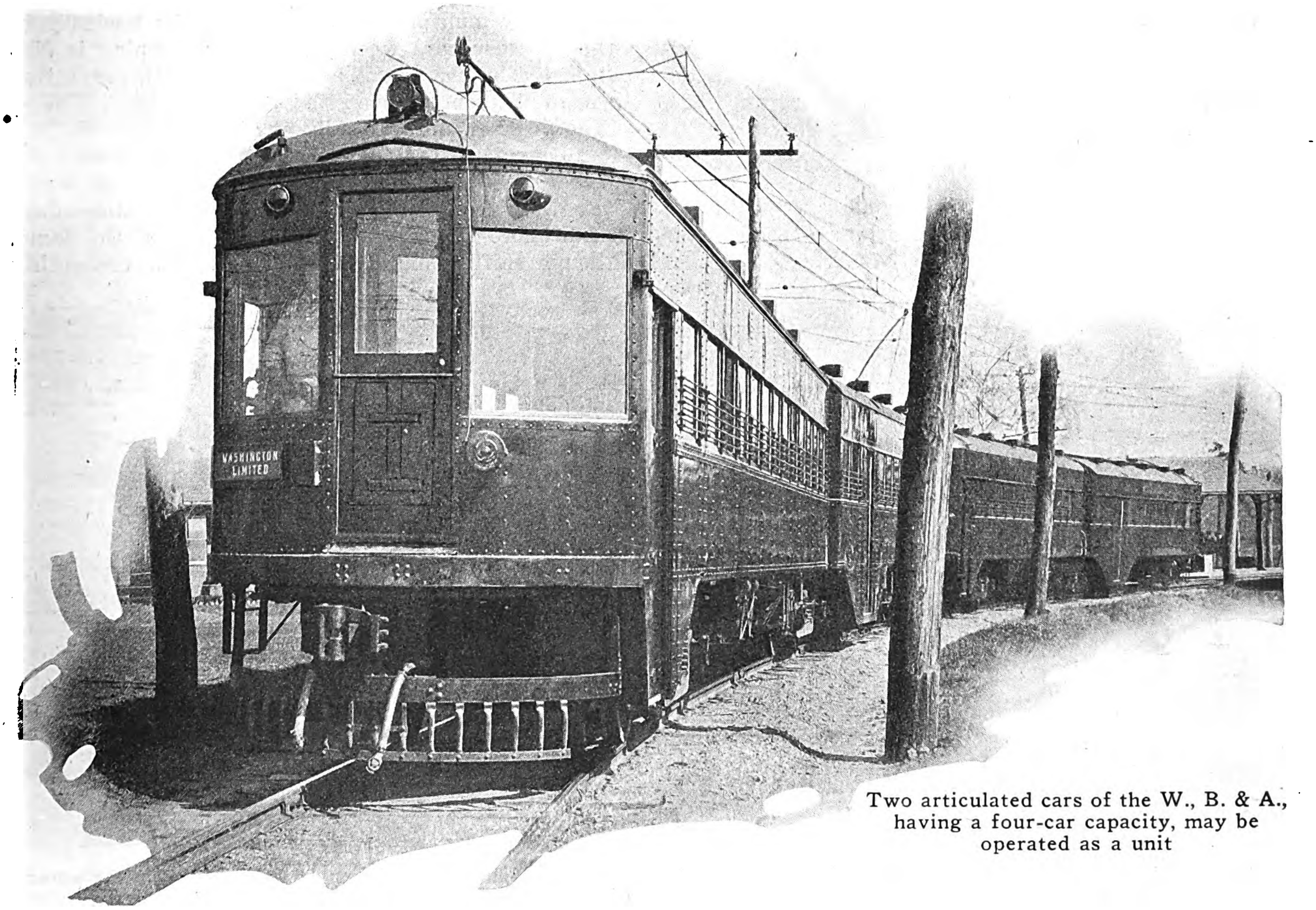
One of the two end trucks before mounting the motors



Center pivot truck without motors but supporting two inner body ends and connecting drum

Articulated Cars in High-Speed Interurban Service

Two-Body, Three-Truck Units Built by Brill and Westinghouse-Equipped Go in Service on Baltimore-Washington Division of the Washington, Baltimore & Annapolis Electric Railroad



Two articulated cars of the W., B. & A., having a four-car capacity, may be operated as a unit

COMPLETE replacement of the high-speed equipment on the 40-mile Baltimore-Washington division of the Washington, Baltimore & Annapolis Electric Railroad is being made as an open challenge to all forms of competitive transportation. The new cars are of the articulated type and the first of this design to be operated in the United States in high-speed interurban service. In addition they are of a de luxe type with better appointments than those of many steam railroads.

Commencing April 1, eight of the new units, built in the Philadelphia plant of the J. G. Brill Company, will be used to fill the half-hour limited schedule between Baltimore and the national capital. Six of the twin cars were delivered early in March and are being "worked in" while the crews become familiar with the details of the equipment. The remaining four have just been delivered and will be ready for regular operation on schedule time. The cars will receive wide publicity as they will help to handle the crowds attending the Bowie race meet starting April 1.

The Washington, Baltimore & Annapolis has lines over two different routes between Baltimore and Annapolis and the main line between Baltimore and Washington. The latter consists of double-tracked private right-of-way as far as the Maryland-District of Columbia boundary line, from where entrance to Washington is over the tracks of the Washington Railway & Electric Company. In Baltimore the company runs its tracks into its terminal on Howard Street.

The two Annapolis lines serve the home of the United States Naval Academy and the intervening territory, much of which is suburban to Baltimore. The country along the Severn and Magothy Rivers is fast developing into summer resorts. Annapolis and the intermediate territory to Baltimore are served solely by the W., B. & A. both for passengers and freight.

The main line between the two major cities is the backbone of the service and revenue of the company. The intervening territory is sparsely settled and hence the need is naturally for high-speed, infrequent-stop service. The Baltimore & Ohio Railroad and the Pennsylvania Railroad are competitors, running many trains from terminal to terminal in 60 minutes or less. With its entrances to the terminal cities on public streets, the W., B. & A. trains require 1 hour and 30 minutes, but have the advantage of more central stations, and charge lower fares.

In recent years de luxe interstate buses between the cities have offered additional competition, and the country-wide automobile expansion has affected this company the same as it has all railways. Despite all this, the W., B. & A. has for a number of years carried annually 60 per cent of all Baltimore-Washington common carrier traffic. Following the enormous peak occasioned by Camp Meade and other World War activities in this territory, the gross traffic has been decreasing consistently, although the 60 per cent ratio has been substantially maintained.

COMBATING COMPETITION A PURPOSE OF THE NEW CARS

The new equipment has therefore been purchased not only to give the essential service but to combat the most serious of the competition. It is expected that additional traffic will be drawn from other channels, particularly private automobiles, as the single intercity highway is greatly congested and the parking situations in the two terminal cities are growing worse daily.

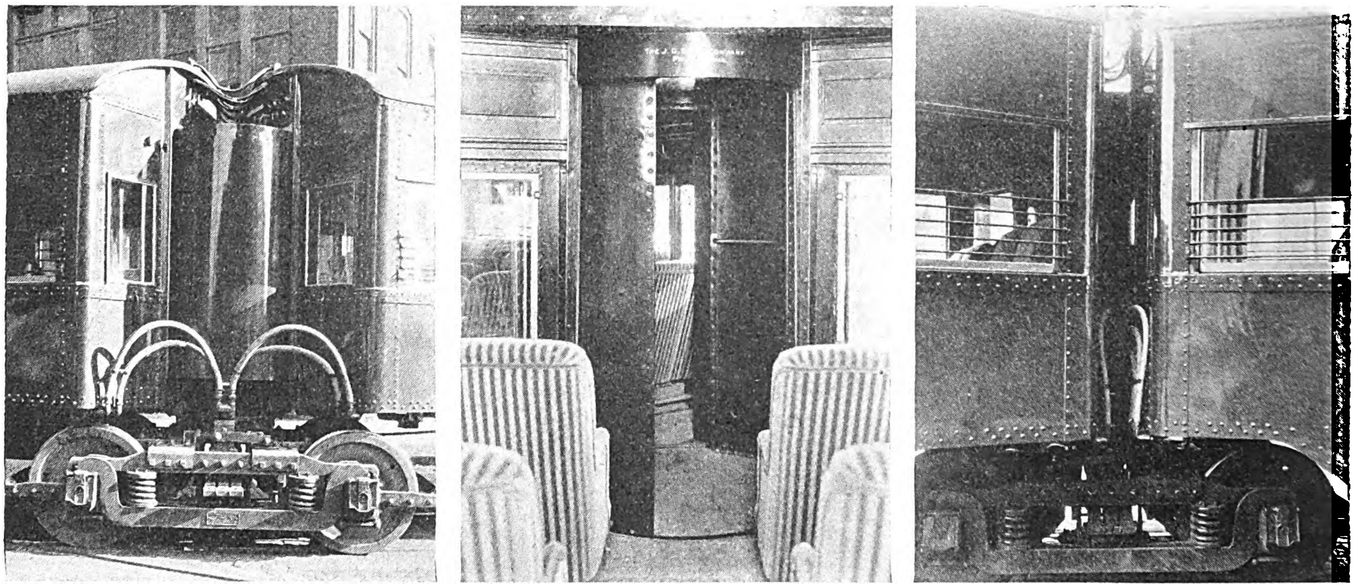
Patronage on the Washington-Baltimore division has always been great enough to require two-car trains, which heretofore have been made up with multiple-unit equipment. The old cars were built of wood in the conventional manner of 1910, weigh 40 tons apiece, or 80 tons per train, and have been in use since the change to 1,200-volt d.c. operation in 1910.

The new cars will provide equal passenger capacity with greatly superior facilities and marked economy. The weight saving of 27 per cent alone will reduce the power bill. Three trucks against four, one set of motors, control and equipment as against two, will immediately be manifest in the cost of equipment maintenance. Maintenance of the track should also be less, due to the lighter weight of the units. By means of the permanent connection, the unit is essentially one car, allowing the use of two trainmen as against three.

Loading and unloading at intermediate points is supervised by the conductor at the side door. All doors are pneumatically operated. At terminals the rear door, controlled from the conductor's position, is also used. Upon entering, the passengers choose either car, the rear body always being reserved for smokers.

Besides the innovation of the articulated feature the cars are equipped and finished with a view to comfort and pleasing appearance. Early trials indicate that these aims have been attained. The rigid connection of the two inner ends on the common truck damps out the nosing or side sway common in either single-car or ordinary multiple-unit operation. The tendency to surge between cars when starting or stopping is also eliminated by the use of a single unit with connection through the center track.

The drum mounted rigidly on the center truck provides easy access between the two sections, giving the effect of one long car unbroken by partitions or doors. Even when negotiating the limiting 50-ft. radius curve in Baltimore the width of opening remains the same, although shifted slightly to the side. The connecting drum is cylindrical, allowing each body to revolve about the outer surface. It is made of sheet steel ⅛ in. thick, supported on steel angles. The bottom is rigidly secured to the center of the pivot truck. Rubber rollers attached to each side of each body are held against the exterior of the drum by springs that allow the entire surface of each roller to engage the drum at all times. In this way practically a tight fit is obtained. A rainstorm was encountered during an early trip and no leakage at these points took place.



W., B. & A. articulated car easily negotiates the limiting curve of 50-ft. radius. View at the left shows the outer side of the car on the limiting curve, while at the right is illustrated the inner side. The center view shows appearance of the connecting drum opening shifted to one side, but still easily passable

The interior finish is pleasing. The floors are mottled gray and black rubber that presents a clean appearance even when soiled after a day in service. The double seats are of the individual chair type with heavy springs in the base and individual pads of light springs, heavily upholstered. The backs are firmly attached to the seats and have a well-shaped curve. The backs are constructed with springs and heavily upholstered. Each seat is completely covered with a striped frieze mohair, light gray in color. While operating loops are provided at each terminal, the cars often must be reversed. For this reason the pairs of seats may be turned horizontally on a center pivot, after releasing a pedal-controlled catch. This feature also permits the seats to be swung partly around should passengers desire to face the side. The twin unit car carries 47 double seats all alike, thus seating 94 passengers. The seats conform to the window spacing of 35 in., leaving ample knee and leg room.

Baggage racks of bronze are mounted overhead with ample clearance. One lavatory with a flush hopper and wash basin is provided at the end of one of the bodies, immediately behind the motorman's compartment. Paper towels and a tank for drinking water are included in the equipment.

Posts, sills, panels and doors are solid mahogany. The ceiling is finished a deep cream, which, with the mahogany trim, makes a pleasing contrast with the neutral gray of the seats and floor.

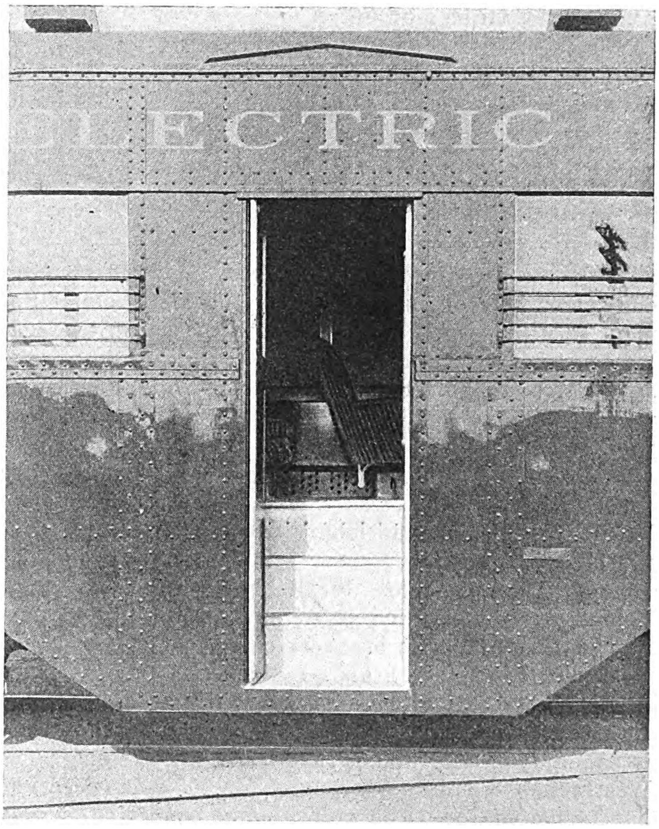
Plate glass set in brass sash is used in all windows. The single side sash may be raised upward into pockets behind the deep letterboard. Illumination is provided by shaded lamps mounted in two rows in the ceiling, one row directly over each seat.

There is a cab for the motorman at the right-hand side of each operating end. A hinged door, glazed in the upper portion, opens into the car. A 22-in. hinged door at the motorman's right, with a glazed drop sash above, gives access to the cab without need for the motorman to pass through the interior. The inclosed compartment contains all operating switches, the controller and the air brake valve. The narrow end doors and left-hand sash are also glazed with plate glass, allowing good visibility forward.

MULTIPLE-UNIT OPERATION POSSIBLE

For extraordinary conditions two units may be coupled together, operated as a train from one position, giving a capacity equal to four of the old cars. To accomplish this there are Tomlinson M.C.B. type couplers at each end and jumper cable connections are placed on the roof. Small end doors allow access between units for the crew. Headlights of the standard portable type used by the W., B. & A. are hung on the forward door, the connectors fastening into sockets in the ends of the illuminated sign boxes shown in the end views. There are two bullseye marker lamps in the letter panel at each operating end. Adams & Westlake No. 252 tail lamps are furnished by the railway.

Specifications tabulated elsewhere show the details of the equipment. In the Jan. 22 issue of ELECTRIC RAILWAY JOURNAL, page 165, were side elevation and floor plan drawings showing the dimensions. The cars are framed with steel, using side sills of 4-in.x4-in.x5/16-in. angles. Center sills are 8-in., 11.4-lb. channels with 3-in., 4.1-lb. crossing channels and 6-in., 10.5-lb. bumper channels. The corner posts are 2-in.x2-in.x¼-in. angles with 3/32-in. steel sheet, while the side posts are 2-in.x2-in.x¼-in. to 5/16-in. tees. The top rail is made of 2-in.x2-in.x3/16-in. angles and the belt rails of 3½-in.x¼-in. flat bar with 16-lb. sheet-steel coping. The letter panel and side sheathing are 3/32-in. patent leveled blue annealed sheet steel. Roof carlines are 1½-in.x⅜-in. steel bars covered with 7/16-in.x2½-in. poplar boards.



Between terminals passengers enter and leave by this center door, where the conductor is located. All doors are under pneumatic control from this position

Scale weights were slightly less than the estimated weights as published in the previous article. The units averaged 58⅓ tons, divided between equipment and distributed on trucks as shown in the accompanying two tables.

General Dimensions and Specifications, W., B. & A. Articulated Cars

Length over all, each section	48 ft. 8 in.
Length over vestibules, two-section unit	95 ft. 4 in.
Length over all, two-section unit	97 ft. 4 in.
Wheelbase, motor and pivot trucks	6 ft. 6 in.
Width over posts	8 ft. 8 in.
Width over drip rail	8 ft. 10 in.
Width of each side door opening	2 ft. 10 in.
Height, rail to top of floor	4 ft. 2½ in.
Height, rail to center line of coupler	33½ in.
Height, top of floor to top of roof board	8 ft. 5½ in.
Height, rail to top of roof	12 ft. 8 in.
Height, rail to top of trolley board	12 ft. 11½ in.
Truck centers, each section	35 ft. 10 in.
Distance center to center of side posts	2 ft. 11 in.
Wheel diameter	36 in.
Seating capacity, section without saloon	48
Seating capacity, section with saloon	46
Total seats	94
Interior trim	Mahogany
Headlining and side lining	¼-in. Agasote
Air brakes	Westinghouse Traction Brake Company
Car signal system	Consolidated Car Heating Company
Car trimmings	Statuary bronze
Compressors	Two Westinghouse D-2-K, 1,200-volt
Control	Westinghouse HL, double-end, 1,200-volt
Couplers	O-B Company Tomlinson No. 23 radial
Curtain fixtures	Curtain Supply Company Rex
Curtain material	Pantasote
Destination signs	Illuminated, in dash
Door mechanism	National Pheumatic Company, not interlocked with control
Fenders	Steel pilots
Gongs	Brill dedenda
Grab handles	Ellcon type, mahogany, porcelain finish
Hand brakes	Peacock tunnel type
Heaters	Railway Utility Company, truss plank No. 130
Journal bearings	4¼ in. x 8 in.
Journal boxes	Brill
Motors	Four Westinghouse 333-VV-8, inside hung on end trucks only
Sanders	Ohio Brass Company
Sash	Rex all-metal type
Seats	Hale & Kilburn No. 900 double rotating chairs
Seating material	Chase frieze plush, pattern No. 188, gray No. 2,082, quality X
Step treads	Kass safety
Trolley retrievers	Ohio Brass Company
Trucks	Brill 26-MCB-2
Ventilators	Railway Utility Company
Wheels	36-in. diameter, 3½-in. tread
Window glass	3/16-in. plate

AVERAGE WEIGHTS OF W., B. & A. ARTICULATED CARS

Bodies, including electrical and air equipment	70,993 lb.
Four motors	14,570 lb.
Three trucks	31,090 lb.
Total weight of complete unit	116,653 lb.
Scale weight on trucks of one unit:	
Front truck carried	41,180 lb.
Center truck carried	32,440 lb.
Rear truck, with saloon carried	42,710 lb.
Total weight of complete unit	116,330 lb.

With one set of four motors, two mounted on each end truck, only one set of control and air brake equipment is necessary. Air brakes are placed on the center truck as well as on each motor truck, giving brake applications on all wheels. Because of the difference in weight distribution, adjustments to apply equivalent pressures on all wheels are made. The straight and automatic type of brakes with emergency features are used with two compressors, one mounted under each body. This is a precautionary measure in case of failure of one compressor.

From the Baltimore terminal to the District of Columbia the operation is with 1,200-volt direct current obtained from an overhead catenary trolley. From this point to Fifteenth and H Streets, N. E., in Washington, a 600-volt direct-suspension trolley is used, and from there to the W., B. & A. terminal 600-volt energy is taken from the underground conduit system. The Westinghouse motors are wound for 600-volt operation, but insulated for 1,200 volts, being connected permanently in series, so that speed is reduced on 600 volts. The free running speed on 1,200 volts is 60 m.p.h., so that half speed is ample in the District and Washington. Control current at 600 volts is obtained through a 600/1,200-volt dynamometer when operating from the high voltage trolley.

The doors are of mahogany, 1½ in. thick, double-folding inwardly. They are weather stripped, and the upper portion is glazed with $\frac{3}{16}$-in. plate glass. They are equipped with National Pneumatic Company engines and may be controlled from the conductor's position or at the doors themselves. They are not interlocked with the control. There are three steps, which are all inside the doors and are stationary, with O. M. Edwards hinged trap doors to close over them. All steps have Kass safety treads. The height from the rail to the underside of the first step, that at the sill, is 11 in. The step heights are 16 in., 11½ in., 12½ in. and 12½ in.

The Readers' Forum

President Sawyer Commends Graham Articles

EAST ST. LOUIS & SUBURBAN RAILWAY

EAST ST. LOUIS, ILL., March 10, 1927.

To the Editor:

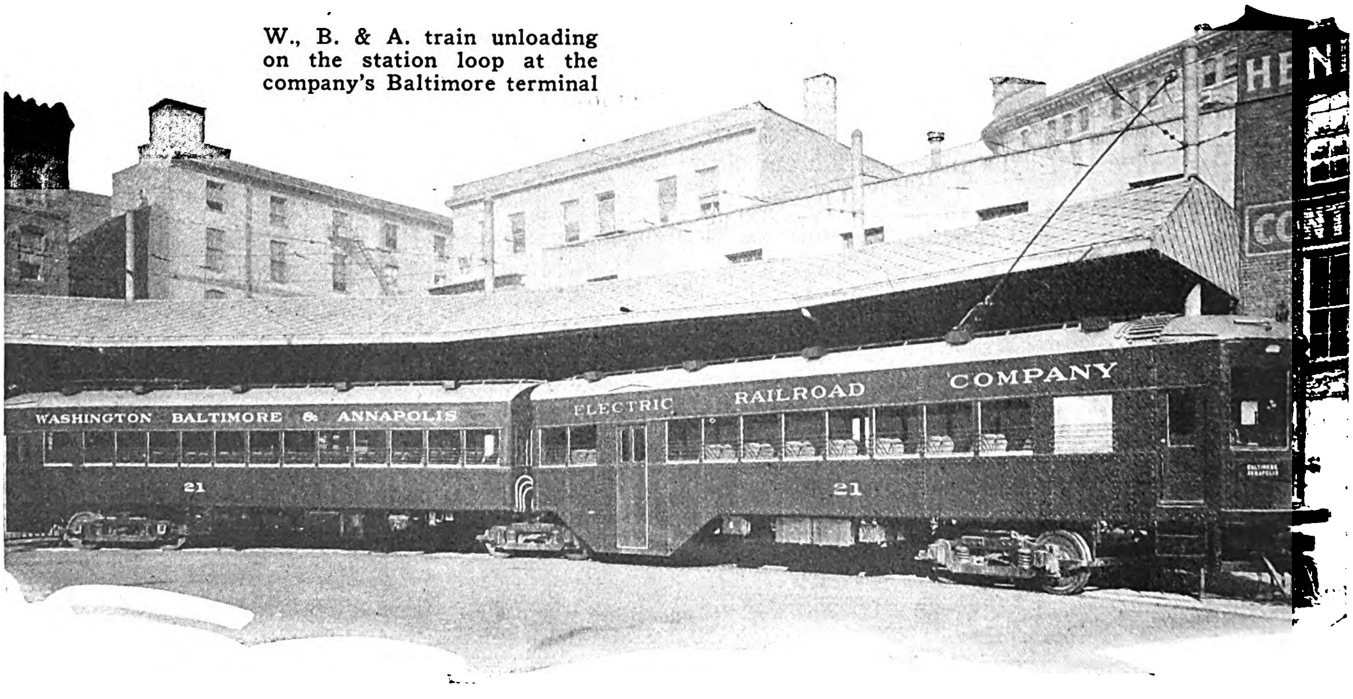
I, too, want to be recorded as one of those who believe that the two articles in the ELECTRIC RAILWAY JOURNAL by R. N. Graham, general manager of railways Pennsylvania-Ohio Electric Railway, represent an outstanding contribution to the discussion of one of the most important subjects before the local transportation industry, viz., "The Place of the Motor Vehicle."

We all agree that the motor vehicle has a place as a new and important transportation tool. Due partly to our own fault and partly to the fault of the motor vehicle manufacturers, few of us have as yet been able to arrive at definite conclusions as to the proper sphere or field of this most important tool.

We are doing neither ourselves nor the motor vehicle industry proper credit when we simply operate buses just to protect ourselves against irresponsible pirates, or because of the so-called "rubber urge," which has been largely an urge on the part of the bus manufacturers to sell rubber-tired buses.

The advantages and disadvantages of the bus have both been discussed in too broad terms, due to the fact that we have lacked definite experience and information. It has been used in places where it should not have been used and has not been used in places where it should have been used. Eventually the bus will take its place, regardless of past prejudices, either for or against. Electric cars will not continue to prevail sim-

W., B. & A. train unloading on the station loop at the company's Baltimore terminal



ply because we hide our heads in the sand and condemn the bus. The day will come when the bus will not be sold or oversold due to high-pressure salesmanship and distorted propaganda. The novelty and the glamor of the bus is fast fading, but not its value as a transportation vehicle.

Mr. Graham hit the keynote in his assumption that the problem is an economic one, and he well sums up the situation when he says that electric cars should not be operated where the bus can be used more effectively, nor should the bus be operated where the street car produces more satisfactory results—taking into account both service to the public and the financial results to the company. Our customers have a right to this service, which is most adapted to their needs, and Mr. Graham's articles, being based upon the actual experience of a progressive, unprejudiced manager, are most helpful in determining just how and where the bus can be fitted into our co-ordinated service.

W. H. SAWYER,
President.

Clean, Bright Cars Attract Riders

DES MOINES CITY RAILWAY
DES MOINES, IOWA, March 5, 1927.

To the Editor:

We are firm believers in the regular and systematic painting of cars, both inside and out, first to attract the attention of passengers and entice them to ride with us, and then from the clean, bright-appearing interior make them want to ride again, for it is always the repeat rides that count.

Several years ago we changed our color scheme from a green to a chrome yellow, with red letterboard and sash. We have found it much more satisfactory, both in appearance and from an accident standpoint, on account of greater visibility. It is our aim to keep all cars as nearly uniform as possible, especially the interior arrangement, as the passengers do not cause the congestion that would occur if several different plans were used. This also applies to the car mechanism, such as controller, brake, gong, etc., as the operator then knows just where to find things in an emergency. This is especially true with new men.

The necessity of changing cars on the road on account of car failure should be held to the lowest number possible, so that passengers will not be caused the inconvenience of changing from one car to another. Trolley wheels and poles are given the closest inspection as I do not believe any one thing can be more annoying to passengers than a trolley wheel that makes a noise multiplied many times by the roof and headlining, which act as a sounding board.

One other part of the equipment that is liable to cause passengers much discomfort is the motor resistance used in starting the car. It is very annoying to have the car give a violent lurch every time it starts, and also the jerking may cause damage suits by passengers falling.

In this day of fast schedules and heavy automobile traffic, flat wheels are more numerous than in years gone by, and must be given attention at once as they are not only uncomfortable to ride on, but are annoying to residents near the car line. We are giving the question of seat upholstery some thought, as clean and comfortable car seats will do much to get repeat riders.

C. R. McMAHON,
Superintendent of Equipment.

A.E.R.E.A. Research Department Proposed

DEPARTMENT OF STREET RAILWAYS
CITY OF DETROIT, March 15, 1927.

To the Editor:

With the trend that events in the electric railway field are taking, succeeding demands for modernization and all the things which follow in its train, we become conscious of one very great defect in our cosmic scheme and that is lack of reliable, unbiased data on many engineering problems. The present method of attacking them is either such research as individual companies can make or investigation by committee of the A.E.R.E.A.

The first plan, or company research, will work satisfactorily for small problems and for that company, but for the industry it is not economic because normally the results are not broadcast, thus necessitating its repetition by other concerns. Nor would the results be acceptable to others because of suspected bias of the investigators and special conditions of tests. The second plan, or that of committee investigation, is much better for the industry at large, but it, too, is far from satisfactory. In the first place, committees are slow in functioning, not through lack of interest but from the inherent nature of the structure. The procedure is too apt to fall into the old stand-by of issuing a questionnaire and basing a report solely upon it. The fault with questionnaires is that in engineering problems individual opinions are given instead of proved statements. Committees are usually formed of men widely scattered throughout the field, which prevents frequent meeting. The members are loaded with the duties incident to their jobs, consequently the gratuitous committee work must be crowded in wherever possible, and this leads to postponement. Heaven knows, procrastination is easy enough without any encouragement! Then, again, committees are mostly without funds, though the recent policy of making appropriations is opening possibilities for adequate investigation heretofore out of reach. This policy means real progress and should be given every encouragement.

However, it is believed that this is not sufficient for the highest and most rapid development. In order to achieve the best, it is thought that the establishment of a research department of the A.E.R.E.A., under the guidance of a competent research engineer with an adequate staff and funds to carry on the work, would meet the challenge to our industry for its place in the field of transportation. It is unfair and certainly undignified that a small group of companies should have to assume the burden of research, and yet this is what they have been obliged to do at times. The very nature of the situation lends itself admirably to co-operative research. The problems to be solved are common throughout the country and there is no competition between companies. This is an ideal situation for correlation of effort.

Under such a plan the committees should be continued, but their functions would be more akin to those of a board of directors. They would outline policy, digest findings and act as the balance wheel. The actual work of investigation and study would devolve upon the research engineers, who, being engaged solely in this work, would be able to go deeper into the subject and produce quicker, and it is hoped better, results.

H. S. WILLIAMS,
Assistant Superintendent of Equipment.

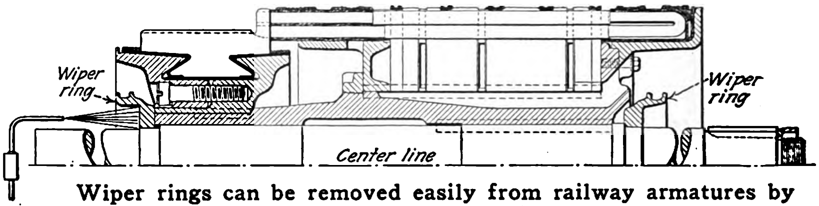
Maintenance Notes

Some Shop Uses for the Oxyacetylene Torch

By F. J. Foote

Superintendent of Motive Power and Equipment the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio

Quite extensive use is made of the oxyacetylene torch in the shop of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, where it is employed to good advantage for several unusual operations. Wiper rings on railway armatures as a rule are not provided with any arrangement for removal, and they are sometimes stuck very tightly onto the shaft. By directing the flame from a torch against the inner face of the ring, and moving the flame around the ring several times, it is heated without appreciably heating the shaft. The expansion of the ring is sufficient to permit its removal easily with a pair of tongs. These rings are indicated on the accompanying sketch.



Wiper rings can be removed easily from railway armatures by heating with an oxyacetylene torch

Dismantling of car trucks is a tedious and disagreeable job, as many of the nuts are rusted onto the bolts or the thread is somewhat distorted due to excessive strain. The removal of such nuts by the old method often requires the cutting of many bolts and rivets and the splitting of the nuts with chisels. This work can be done very quickly and neatly with a cutting torch, and the ruining of a few bolts that might be reclaimed by the old method is more than compensated for by the time saved.

Various metal parts of the truck require straightening, and a common method is to remove them from the truck for this purpose. By heating such parts with a torch they can be straightened with a wrench or a sledge while in place. Care must be exercised in this heating not to burn the metal. This can be prevented by keeping the torch in motion constantly. The writer has seen an area about 6 in. x 6 in. on a 1-in. steel plate heated to a bright red heat in this manner.

In cases of car wrecks the cutting torch is indispensable. Work that formerly required hours can be done with the torch in minutes. The element of time under wreck conditions is frequently of utmost importance, and the matter of cost is of little consequence compared with the necessity of clearing the wreck in the least possible time.

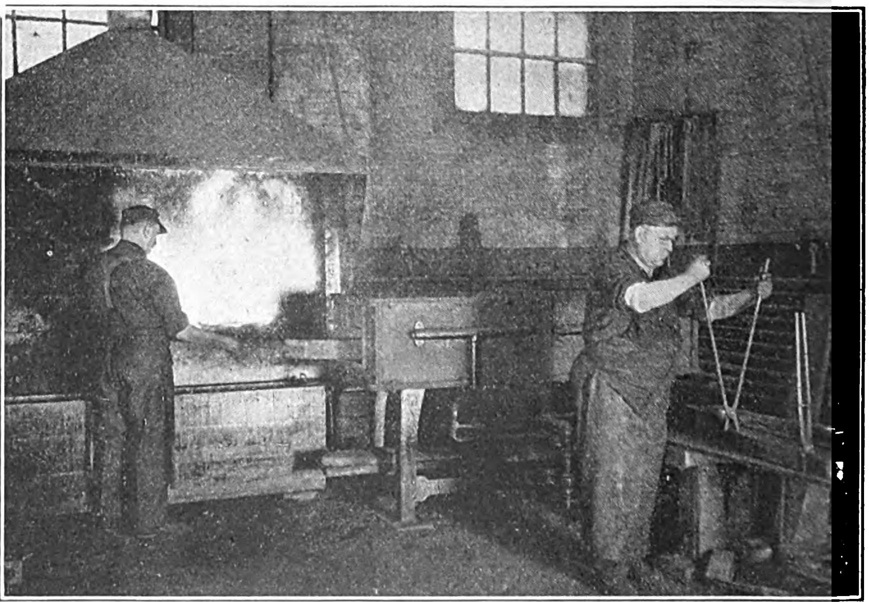
Another convenient use for the torch is the straightening of armature shafts and similar parts which must run true. To straighten a shaft, the complete armature is mounted on lathe centers and rotated slowly, the torch being held stationary and the flame directed to the point where the shaft is bent. Jacks or bars are used for the straightening, which is done as soon as the section is heated to the necessary temperature. Pressure is applied with the jack or bar and the heat from the torch can frequently be continued even while the pressure is being applied. The great convenience and time-saving feature is that the shaft can be tested repeatedly, marked, heated and straightened without removal from the lathe.

Tempering and Resetting Springs

By C. A. Kyle

Wolf Street Shops, New York State Railways, Syracuse, N. Y.

Spring repairs are facilitated and the cost of tempering and resetting springs has been reduced by a spring-tempering furnace of the gas-burning type that recently has been installed in the Wolf Street shops of the New York State Railways, Syracuse, N. Y. The furnace has a cast-iron frame, 6 ft. long by 2 ft. wide by 14 in. high. This is lined with retort brick, capable of withstanding very high temperatures without crumbling. Gas is supplied by a 2-in. pipe which is fitted into



Tempering and resetting of springs at the Wolf Street shops of the New York State Railways, Syracuse two manifold type burners, one on each side of the furnace. The flames from these burners are directed through port holes in the walls of the furnace.

To get the maximum amount of heat from the gas flame, air is mixed with the gas. The mixture is regulated by an inspirator which uses high-pressure air blown through a small opening in a Y fitting, one end of which is open to the atmosphere. This fitting is connected to the gas pipes ahead of the point where they reach the furnaces. It is regulated to furnish the right amount of air to obtain the pressure desired. A safety feature is a check valve in the gas meter that closes and automatically shuts off the flow of gas in case of a backfire in the pipes leading to the furnace.

Two of the principal troubles found with car and bus springs are flattening out due to loss of temper, and breaking of the leaves. Loss of temper is usually the result of improper tempering when the spring is first assembled. Over-tempering makes the steel too hard and causes breaking of the leaves when the car or bus is overloaded.

The practice in the Wolf Street shops when a spring becomes flat is to remove it and take it apart. Each leaf is reshaped individually to conform with specifications. The leaves are then placed in the tempering furnace, which has been heated to proper temperature, and are allowed to remain until they have obtained the proper color, usually a dark red. They are then removed and dipped in a tank of oil.

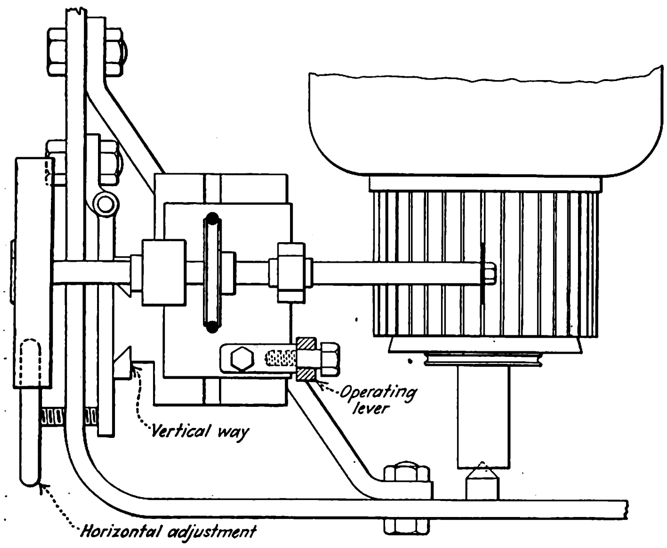
The oil for tempering is kept cool by having it in a double-walled tank, the space between the inner and the outer wall being filled with running water. The water enters at the top and is discharged at the bottom, thus keeping a continuous flow of cool water. The tempering cannot be done successfully if the oil gets warmer than 98 deg. F.

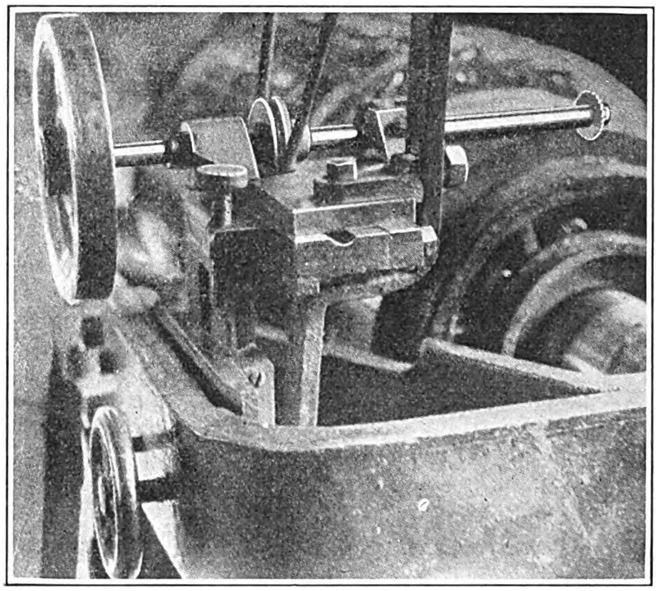
After the leaves have been removed from the tempering tank, they are assembled and retaining bands are shrunk on.

Where the leaves are broken the spring is taken apart and new leaves of the same material and dimensions are made and tempered for installation in place of the broken leaves.

Commutator Slotter with Alignment Adjustment

DESIGN of the commutator slotter built and used in the shops of the Los Angeles Railway combines simplicity with accuracy and ease of operation. In addition to the adjustments for depth of cut and length of stroke, it also permits of alignment of the cut to take care of slight variations in segments.





This commutator slotter provides for convenient adjustment to suit conditions

Plan of commutator slotting apparatus that is mounted inside of the main frame which supports the commutator while the mica is being cut away.

Alignment is controlled by screw which swings entire slotting apparatus in a horizontal plane about the hinged end of the supporting casting. The slotter spindle is driven by a round belt from an overhead shaft. A balance wheel is carried on the outward end of the spindle.

The spindle carrying the milling cutter on one end and a balance wheel on the other is mounted on the main carriage of the machine. This carriage is moved back and forward by a lever, the spindle being driven throughout the travel of the carriage by a ½-in. round belt, which in turn is driven by an overhead pulley with an idler taking up the slack in the belt. The entire carriage may be raised and lowered by a screw. The depth of cut is controlled by a set screw on the top of the carriage. The main frame with its vertical way is carried in a casting that is hinged at one side and is moved in or out by an adjusting screw. It can be locked in any position by a set screw. With this arrangement the entire apparatus inside the supporting frame may be swung in a horizontal plane to obtain alignment of the cutter with the slot of the commutator.

"Ask Dad, He Knows"
the value of systematic and regular inspection.

Old Rattan Seats Stained Green

IMPROVEMENT in the appearance of the car interior has been effected by the Atlantic & Suburban Railway, Pleasantville, N. J., by staining old rattan seats green. The problem of restoring these seats was complicated by previous unsuccessful attempts to improve their looks. Several years ago, when the rattan had become dirty, the seats were treated with mahogany stain. That color proved to be too dark to be satisfactory. Next the seats were painted, but the paint chipped off. Finally as much as possible of the previous treating material was removed. The seats were then given a coat of green Japan thinned with turpentine. This was immediately wiped off with a rag. Then a coat of Wilson's cane glaze was applied. As a result of this treatment the seats have a clean, fresh, green color, harmonizing well with the other interior fittings of the car.

New Equipment Available

Heavy-Duty Chassis

DESIGNED to meet the severe demands of constant starting and stopping and with abundant power and speed, a new heavy-duty chassis for the 21-passenger street car type bus has been announced by the Studebaker Corporation, South Bend, Ind.

The motor has a positive force-feed lubricating system and the chassis is lubricated by a high-pressure system. A specially designed 1½-in. double-jet, two-range carburetor is used. Current is supplied by a 12-volt generator, accessibly mounted at the right forward end of the engine, and by a threaded-rubber-separator storage battery. The distributor is at the left front of the engine and the entire ignition system is protected against moisture.

The starter is operated by a switch on the floor board. A 30-gal. gasoline tank is carried at the rear of the frame and the fuel is fed to the carburetor through a vacuum tank system. A tubular radiator, four-blade 20-in. fan and a circulating pump system cool the motor.

The clutch is of the double-disk, dry-plate type and the transmission, a selective type with four speeds forward and one reverse, is in unit with the clutch and engine. The semi-floating rear axle has extra large chrome molybdenum shafts. The drive gear is of the spiral bevel type.

The use of the Hotchkiss drive principle eliminates torque tubes or radius rods. The torque and drive are taken through the springs and the propeller shaft is a 3-in. diameter steel tube, turning through three universal joints and with the angle of drive a minimum because of the low-hung chassis design. The springs are semi-elliptic, with fourteen leaves in the 36-in. front units and twelve leaves in the 56-in. rear units. Newly designed short shackles reduce side sway.

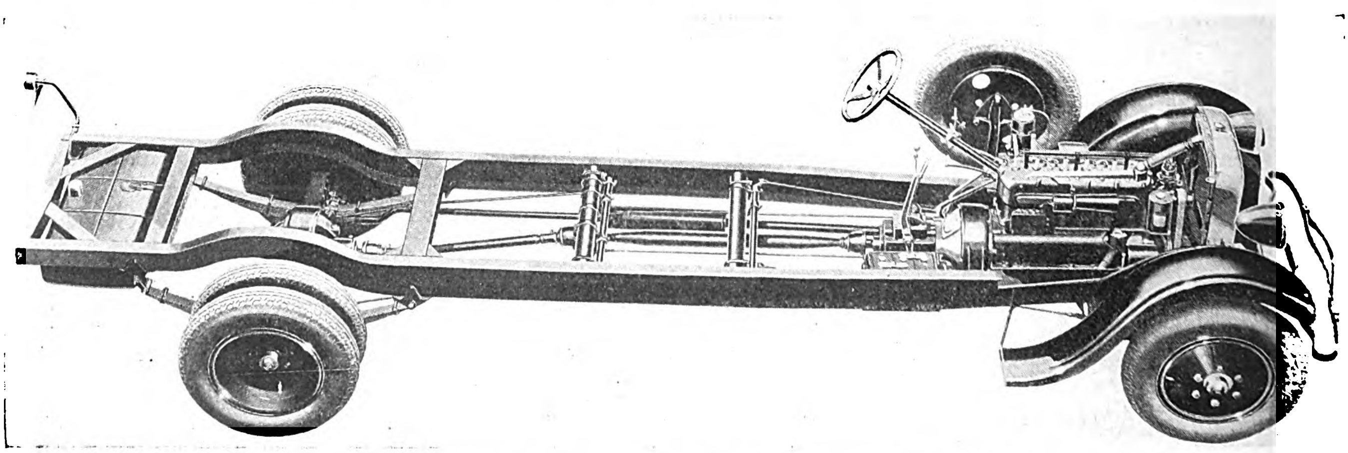
Mechanical internal expanding four-wheel brakes are used. These brakes are 3 in. wide by 17¼ in. diameter and have three expanding shoes which utilize the speed of the vehicle to increase the braking action. Hand emergency brakes operate on the rear wheels. The steering gear is of the cam and lever type, designed for balloon tires. The pressed channel steel frame is narrow at the front to allow a short turning radius, with side members 8 in. deep and 3-in. flanges secured by nine stout cross members, of which two are tubular. The non-skid 34 x 7.50-in. balloon tires and dual rear wheels add safety and comfort. Without changing wheels this chassis may be equipped with 32 x 6-in. high-pressure tires if desired. There is sufficient space between the dual rear wheels to allow chains to be put on or taken off easily.

Two-beam acorn headlights are controlled from a switch on the instrument board. The new chassis is equipped with speedometer, eight-day clock, engine thermometer, ammeter and oil pressure gage grouped under an oval glass on the instrument board, rear traffic signal light, ignition switch on instrument board, automatic windshield cleaner, rear view mirror, front full width bumper, spare tire carrier and four-wheel brakes.

Improved Welding Electrode

WELDING electrodes of a new type which combine the characteristics of a fluxed electrode and the quality of bead finish and the cleanness in handling of a bare welding electrode have been introduced by the merchandise department of the General Electric Company, Bridgeport, Conn. Recommended for the general welding of steel, the electrode has a uniform flowing quality. The absence of sputtering or spattering, characteristic of the usual commercial bare welding wire, is said to be one of the features of the new material. The elimination of the erratic arc condition leads to a deposit of more material with the same consumption of electrode per kilowatt-hour. The electrode penetrates quickly and produces high tensile strength and unusual ductility and elongation.

The electrode, which has been designated GE type F, is furnished in 3/32, 1/8, 5/32, 3/16 and 1/4-in. sizes. The standard package is 50 lb., burlapped. It is also furnished on steel reels of approximately 200 lb., or in coils of approximately 150 or 200 lb.



Many desirable operating features have been incorporated in this chassis

Association News & Discussions

Illinois Utility Men Denounce "Home Rule"

WITH the Illinois Legislature in session and committees considering two so-called "home rule" bills, members of the Illinois Gas Association, Illinois State Electric Association and Illinois Electric Railways Association met in Springfield on March 17 and 18 and in no uncertain terms denounced both bills. That the Illinois utilities associations are not in favor of home rule, but are vigorously opposed to it, could be gained after the first few minutes of the opening session of the two-day convention. Throughout the meetings at both the general and the several sessions of the individual associations, papers read and discussion offered pointed out the fallacy and difficulty of municipal regulation of such extensive utilities as exist in the state.

Of as great importance to the electric railway men in attendance were the papers and discussions on subjects which, according to W. H. Sawyer, president of the American Electric Railway Association, mark a new era in transportation. Today, according to Mr. Sawyer, in discussing one of the papers presented at the first session of the railway meeting, railway men are studying traffic control, one-man car operation, bus operation and modernized cars. Railway executives who even five years ago prided themselves on their knowledge of operating problems today have many new lessons to learn. More opportunities present themselves for advancement in the industry than ever before, he said.

NEW CAR TRUCK EXHIBITED

This point of view was forcefully illustrated by a new type of electric railway car truck of the Chicago & Joliet Electric Railway, shown for the first time so that both railway men and manufacturers could see the advancement made in truck construction on the initiative of J. R. Blackhall, vice-president and general manager of the company.

Abandoning the conservatism which usually characterizes a railway executive at conventions, Mr. Blackhall explained why it was necessary for him, as an operating man, to design and have built a piece of railway equipment in order to improve operating efficiency and reduce the weight per seated passenger of the completed car. He enumerated some of the obstacles which he had to overcome in pioneering a truck, not the least of which was the general indifference toward fundamental improvements in rolling stock. With the co-operation of the Timken-Detroit Axle Company, the Westinghouse Electric & Manufacturing Company and the Westinghouse Air Brake Company, together with automotive parts manufacturers, Mr. Blackhall was able to design his truck so as to make a large weight reduction from conventional construction. Reduction of noise by full inclosure of gearing, spring suspension of motors and easy riding qualities were other objectives sought.

HOME RULE SCORED

On the subject of home rule, which according to the bills now before the Illinois State Legislature means the regulation of utilities by municipalities rather than by a state regulatory body, S. I. McElhoes, attorney of Oklahoma City, Okla., gave an interesting statement of how the indeterminate or revocable franchise works in his state. That this type of franchise is equitable and just is shown by the relationship between the people of Oklahoma and the telegraph and telephone companies, which in that state have had continuous franchises for 35-year periods. Only in the last two years has the State of Oklahoma had the revocable franchise adapted to other utilities. At a recent referendum vote sponsored by the "anti" forces the people again indorsed the indeterminate franchise, and as a result all utilities are regulated by the corporation commission and not by the individual municipalities which they serve.

In addition to his active participation in the discussions of the railway section papers, W. H. Sawyer delivered a paper at the opening joint session of the convention. In this paper Mr. Sawyer presented an outline of the utility situation in Australia, where last summer he made a detailed study of utilities operations in the Antipodes.

COMING MEETINGS
OF
Electric Railway and Allied Associations

April 1—**American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

April 26-29—**Southwestern Public Service Association, convention, New Orleans, La.**

May 31—June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.**

THREE IMPORTANT SUBJECTS DISCUSSED AT FIRST RAILWAY SESSION

E. J. McIlraith, staff engineer Chicago Surface Lines, opened the first afternoon session of the Electric Railways Association with an interesting technical discussion of traffic regulation for cities of all sizes. In the opinion of Mr. McIlraith, the problem needs practically the same treatment in all communities. As an example of the task which confronted the Chicago Surface Lines in establishing traffic regulations, Mr. McIlraith cited some figures on the pedestrians and vehicles making use of the downtown streets during a business day. More than 66,000 people pass between curb lines at State and Madison Streets in one hour. More than 800,000 vehicles, of which 90,000 are automobiles, come into the Loop district in twelve hours. It was Mr. McIlraith's suggestion that the railway management take up the burden of regulating street traffic.

Other factors in traffic regulation as brought out by Mr. McIlraith's paper, which will appear in a later issue, were discussed, tying them in specifically with conditions in Chicago and on the Chicago Surface Lines. According to Mr. McIlraith the traffic signals should be installed when there is a volume of 16,000 vehicles in the sixteen-hour period and only when traffic conditions warrant such installations for safety and speed.

In discussing Mr. McIlraith's paper, G. W. Welsh, vice-president, East St. Louis & Suburban Railway and president-elect of the Illinois Electric Railways Association, stated that the $50,000-per-mile cost of constructing track includes day work under heavy traffic conditions. In view of the plea of Mr. McIlraith for more extensive night work, Mr. Welsh was of the opinion that a considerable part of the cost of track construction could be saved by night work.

Specific details relative to motor bus maintenance on the East St. Louis & Suburban Railway were given in a paper read by H. P. MacDonald, superintendent of automotive equipment of that property. Mr. MacDonald's paper, in which the importance of good housekeeping was stressed, was published in the March 19 issue.

Discussing Mr. MacDonald's paper, Fred Klock, in charge of the maintenance of motor coach equipment for the Chicago, North Shore & Milwaukee Railroad, stated that garage design and operation necessarily must be modified to meet individual requirements. He suggested, however, that 150 ft. be the minimum width of the garage. Pits should be flush with the floor, with no curbing, thus providing for additional storage space with the pits not in use. An attempt has been made by his department to standardize small part fittings and units. He felt, however, that there was hardly a chance of standardizing the entire coach due to the rapid development in design and construction.

At the Springfield Engineers' Club dinner, Thursday evening, the new chairman of the Illinois Commerce Commission, David H. Jackson, spoke about the extensive work of that commission in giving fair regulation to 700 utilities, exclusive of bus lines and steam railroads, with a valuation of $1,600,000,000. He contended that in the past railways have relied too much on legal help to obtain raises in rates, which could be obtained with less effort if the utility would improve its service, spending the money in betterments.

MUNICIPAL OWNERSHIP AIRED AT FRIDAY JOINT SESSION

Following the report of the Illinois Committee on Public Utility Information, read by J. F. Gilchrist, chairman, Prof. H. B. Dorau, research assistant Institute for Research in Land Economics and Public Utilities, Northwestern University, explained by charts and data the transition which is taking place with respect to municipal ownership of power companies. Changing conditions have been responsible for the installation of municipally owned plants and their subsequent acquisition by privately owned power systems.

Dr. H. M. Gray of the University of Illinois explained in detail the courses given there in public utility work. While the university can teach the fundamentals, it is necessary that the students, both undergraduate and graduate, be given practical experience in the public utility plants.

Methods developed and used in the shops of the Illinois Traction System at Decatur were explained by J. D. Barnhart, superintendent, in a paper dealing with "Interurban Maintenance and Shop Practices." Mr. Barnhart dwelt upon four shop practices, namely, moving trucks from under cars, removing compressors, babbitting armature bearings and painting the equipment. An abstract of Mr. Barnhart's paper will appear in a later issue.

MECHANICAL MEN MUST KEEP UP TO DATE

Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, discussed Mr. Barnhart's paper with a description of shop practices on the North Shore Line as compared with those employed in the shops of the Illinois Traction System. He felt that the present-day mechanical force must look to its laurels if it is to keep abreast of modern car design and construction. He referred to the truck exhibited by Mr. Blackhall as an example of what to expect in the future.

What modernization in car equipment will do to an electric railway property was given in a paper read by M. J. Oswald, sales representative St. Louis Car Company. Mr. Oswald took the facts and figures already presented in ELECTRIC RAILWAY JOURNAL'S new car story and supplemented these with suggestions of improvements on newer cars.

Following Mr. Oswald's paper, Mr. Blackhall gave figures on the result of new car operation by the Chicago & Joliet Electric Railway. For the six months period prior to installation of ten new cars costing $170,000 on the interurban lines of the system, the revenue on the city lines increased 1 per cent and on the interurban lines 0.65 per cent. For the six-month period following installation of the new cars, the revenue on the city lines decreased 0.47 per cent, while the revenue on the interurban lines increased 6 per cent, or $9,656. At this rate the new cars show an increased earning capacity of $20,000 per year. During this six months, however, the cars showed a saving in operating expenses of $17,000. If this continues for the next six months, the saving will amount to $34,000 for the year. Thus, with an investment of $170,000 the company has an indicated return of $54,000 per year, or almost 33 per cent on the investment.

How track is maintained on the largest electric railway property in the world was detailed in a paper read by Jonathan Wolff, assistant supervisor of track and roadway Chicago Surface Lines. Four points were brought out by Mr. Wolff as important in trackwork. These were: (1) Improved organization, (2) use of power tools, (3) electric welding, (4) safety precautions. Mr. Wolff's paper will be abstracted in a later issue.

Officers elected for the Illinois Electric Railways Association for the coming year are:

President, G. W. Welsh, vice-president East St. Louis & Suburban Railway.

First vice-president, Ray Palmblade, Illinois Power & Light Corporation.

Second vice-president, C. H. Jones, Chicago, South Shore & South Bend Railway.

Executive committee, the officers and B. I. Budd, Chicago; W. H. Sawyer, East St. Louis, and H. M. Lytle, Chicago.

One Man Better than Two*

By R. F. PALMBLADE
Manager Peoria Division Illinois Power & Light Company

ONE-MAN operation of city street cars is nothing new; in fact, as most transportation people well know, one-man operation of city horse cars was universal in early city transportation. However, development of the automatic pneumatic devices on street cars was, to my mind, the first attempt along sound engineering lines toward designing equipment with the working parts so co-ordinated and simplified that one-man operation of the unit as a whole was comparatively easy. After the car had been developed the first thought in the mind of the public was that the plan was simply one of eliminating the wages of one man on each car. This, in turn, suggested slower operation and less safe operation, for the reason that it seemed a natural deduction that two men could handle a car with more speed and in a safer manner than could one man. Some of you will, perhaps, recall that this view was shared, in part at least, by some of the executives in the industry. Of course most of us, as transportation men, knew that the theory of one-man operation was sound.

Let it be said, for the good judgment and loyalty of the car operators as a whole, when the new system was adopted they, as a rule, were not insensible of the advantages of this idea to the public, the companies and, directly and indirectly, to themselves, and, in general, they co-operated in a wholehearted way. Most of the foregoing applies to companies in cities of moderate size, which, of necessity, were usually the first to establish one-man operation. The idea is still growing, however, because, after all, facts are facts and cannot be controverted. There still are, perhaps, areas so congested from a traffic standpoint that two-man operation is still necessary. In areas of moderate traffic density an approximation of two-man operation in those particular sections can be worked out, still retaining the one-man principle.

REDUCES ACCIDENTS

There are some advantages to the public in this scheme, most of which were elaborated upon when the cars were inaugurated. Notwithstanding the increase in the average fare compared to a few years ago, on most properties it would undoubtedly be higher if it were not for the one-man car. The positive decrease in accidents per unit of miles operated and the fact that boarding and alighting accidents are almost a negligible quantity on one-man operated properties that employ the latest automatic pneumatic devices on their cars is a positive advantage to the public and one not to be lightly considered. On the Peoria Division of the Illinois Power & Light Corporation they do not average over one or two accidents of this type per year on the property. The accidents mentioned are of an insignificant nature, comparatively speaking, such as a heel catching in a folding step, which is not the fault of the equipment nor the car operator.

In this day of automatic traffic signals in our city streets the rider on a modern one-man car has a decided advantage in time saved, as the car operator can immediately proceed with the green light without waiting for the customary bell signal, which is usually necessary on a two-man unit. The pneumatic safety devices on the car, in conjunction with the automatic platform signal, permit the one-man car operator to take advantage of seconds, which in the aggregate through a day's run total many minutes. This is an undoubted advantage to the passenger, as he feels the operator has a chance to be alert and avoid the little trifling delays that irritate the public. Perhaps, in addition to the time saved, there may be that a little psychology enters into the passenger's demand to be on the move. Notice the auto driver who fails to start instantly on the green traffic light and listen to the chorus of sirens and horns. In the old days traffic flow was measured in minutes, but it is now measured in seconds—consequently, every second gained by one-man equipment eventually redounds to the benefit of the public.

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*Abstract of a paper read before the Illinois Electric Railways Association, Springfield, Ill., March 17, 1927.

IMPROVED DEVICES SAVE TIME

In order to call attention to one of the advantages of one-man operation, it is perhaps permissible to dwell a moment on one of the arguments against the plan. For instance, it has been said that, in areas of heavy traffic density, one man on a street car cannot handle the business as rapidly as can two men. This is true if the unit is obsolete and old-fashioned schemes of handling fares and transfers are used. It has been demonstrated that if the one-man car has pneumatically operated twin front doors, so as to handle simultaneously outgoing and incoming files of passengers, and, in addition, has a rear door pneumatically operated where passengers can board with the assistance of a street fare collector, less time will be taken in loading the car than under the two-man system.

Ordinarily, with two-man operation, passengers board at one end of the car and pay their fare to one of the operators. With a street collector both he and the operator collect fares from separate files of passengers without interference from the outgoing file. It is needless to point out that the street fare taker is usually necessary only during the peak-load periods. This is a distinct advantage to the public because it facilitates loading beyond ordinary two-man operation and, again, time is saved to the passenger, to say nothing of largely eliminating crowding in boarding. Also, the advantage of prompt handling is available to the public when it really wants it, i.e., during the peak-load periods.

One-man operation has stimulated the development of the modern transfer, which has a higher degree of visibility through more simple arrangement, together with the elimination of cumbersome complex markings and punchings. The modern transfers require no punching by the operator while he is actually operating his car and may be torn off the pad as rapidly as giving out rain checks at a ball park. It seems to me that without the stimulus of relieving the one-man car operator of tedious duties the transfer would not be so far advanced in design. This is a direct advantage to the public, and further, it puts the one-man car on a parity with the two-man car in so far as speed in issuing transfers is concerned.

Speed in collection and registration of fares has been spurred by the widespread use of one-man cars in city service. Where registration is still followed automatic, speedy equipment has made it easier for the passengers to file into the cars without confusion and delay in loading. This all tends to a better relationship between the public and the company.

The passenger-actuated and pneumatically operated treadle exit on the rear of modern one-man cars permits the passenger to leave by the rear without waiting until a conductor has determined whether the car has stopped before opening the rear door. With this new device, immediately upon the car coming to a stop the rear door exit is at once available and there is no waiting for the conductor to close the rear exit and give the motorman the starting signal. This selectivity at the personal convenience of the passenger has a tendency to please, which is most assuredly an advantage to the public.

In cities where one-man operation has been given a fair test with modern equipment it has been proved to the entire satisfaction, not only of the operating companies but of the public as well, that one-man cars produce a more economical, a safer and a more satisfactory transportation service. The time may come when a man on the rear end of a street car will be unnecessary except perhaps in extreme cases. Even these extreme conditions have a way of solving themselves, due to advancement in the design of equipment and accessories.

The average American of today has developed what might be termed an "automobile sense." He likes decision, alertness and speed, to say nothing of safety, in his city transportation. The automobile driver will brook no interference in the handling of his car, particularly from the back seat. It is not the duties a driver performs in running an automobile that distract his mind, because these duties become mechanical, but rather the interference from other occupants of the car. So the average individual is content to permit one man to handle a public vehicle, knowing that it is an advantage to him as a passenger to have one man absolutely responsible. He knows that there will be no confusion resulting from a multiplicity of bell signals to the motorman, and that there will be no back-seat driving. The psychology is apparent.

ADVANTAGES OF ONE-MAN OPERATION

Our experience has shown that with the one-man operation it is possible to furnish more frequent service by the use of a larger number of smaller transportation units; a faster service by the use of a lighter car, capable of quicker acceleration; a more comfortable ride, by reason of the supplying of modern type of carrier; a safer ride, because of the automatic air brakes and the various pneumatically operated devices that have been outlined, including door-closing and step-raising equipment.

From the standpoint of the company, the use of the one-man car has decreased the cost of operation, since it uses less current and because of lighter weight does not require the high maintenance cost for track and roadway. While the saving in wages paid to car operators is negligible, because of the larger number of units operated, and a higher basic wage paid to the operators, still there has been some economy effected from the wage standpoint.

Were it not for the one-man type of operation the public would be paying much more today for a street car ride and many transportation systems would long since have passed out of existence.

Decision on Inspection and Testing of Electric Locomotives

PURSUANT to a petition of the American Electric Railway Association a hearing was held before the Interstate Commerce Commission Nov. 1, 1926, in regard to the rules and instructions for the inspection and testing of locomotives propelled by power other than steam. A decision has just been rendered. The primary question involved was whether or not the railway companies included in the membership of the association are subject to an order of Dec. 14, 1925, in so far as it relates to electric locomotives used or permitted to be used on lines operated by members of the American Electric Railway Association.

Questionnaires were sent to the respective carriers calling for data showing the general character of their lines, the equipment used thereon and the nature of the traffic handled. The association contended that the locomotive inspection law as enacted does not apply to electric locomotives or electric apparatus and, second, that the law as enacted does not apply to any electric railway unless such railway is being operated as an integral part of a general steam railroad system.

The Interstate Commerce Commission decided that this ruling applied to 116 carriers. To decide which were street, suburban or interurban electric railways, the carriers were considered individually. Returns to the questionnaires indicated that only one of the carriers is operated as a part of any other railroad. After careful consideration of the matter, it was decided that the carriers listed below, as at present operated, are street, suburban or interurban electric railways, not operated as a part of a general railroad system of transportation, and that they do not fall within the scope of the locomotive inspection act as enacted:

Berkshire Street Railway.
Hudson Valley Railway.
Hull Electric Company.
Kansas City, Clay County & St. Joseph Railway.
Key System Transit Company.
Massachusetts Northeastern Street Railway.
Milwaukee Electric Railway & Light Company.
Muskogee Electric Railway.
Omaha, Lincoln & Beatrice Railway.
Quebec Railway, Light & Power Company.
San Francisco, Napa & Calistoga Railway.
Southern Indiana Gas & Electric Company.
Tennessee Electric Power Company.
United Electric Railways Company.
Wiles-Barre & Hazleton Railway.

Wisconsin Power & Light Company.
York Utilities Company.
Kansas City Public Service Company.
Springfield Street Railway.
Worcester Consolidated Street Railway.

The record shows that no locomotives are used on the lines of the following carriers and therefore it is not necessary, at this time, to determine whether these carriers are subject to this act:

Alabama Power Company.
Androscoggin & Kennebec Railway.
Auburn & Syracuse Electric Railroad.
Augusta-Aiken Railway & Electric Corporation.
Aurora, Elgin & Fox River Electric Company.
Bangor Hydro-Electric Company.
Beaver Valley Railroad.
Benton Harbor-St. Joe Railway & Light Company.
Capital Traction Company.
Chicago, South Bend & Northern Indiana Railway.
Cleveland Southwestern Railway & Light Company.
Cortland County Traction Company.
Cumberland County Power & Light Company.
Dayton & Western Traction Company.
Denver & Interurban Railroad.
Elgin & Belvidere Electric Company.
Fresno Traction Company.
Indiana, Columbus & Eastern Traction Company.
Indiana Service Corporation.
Indianapolis & Cincinnati Traction Company.
Lehigh Valley Transit Company.
Marion and Bluffton Traction Company.
Michigan Electric Railway.
New Castle & Lowell Railway.
New York & Stamford Railway.
Northern Ohio Power & Light Company.
Ohio Public Service Company.
Ohio Valley Electric Railway.
Olean, Bradford & Salamanca Railway.
Peninsular Railway.
Northwestern Electric Service Company of Pennsylvania.
Rochester, Lockport & Buffalo Railroad.
Sioux City Service Company.
Southern Ohio Public Service Company.
Springfield & Xenia Railway.
Steubenville, East Liverpool & Beaver Valley Traction Company.
Toledo, Fostoria & Findlay Railway.
Toledo, Ottawa Beach & Northern Railway.
Union Traction Company of Indiana.
Washington, Baltimore & Annapolis Electric Railroad.
Washington-Virginia Railway.
Western Ohio Railway.
Winona Service Company.
Lima-Toledo Railroad.
Central California Traction Company.
Milwaukee Northern Railway.

The carriers listed below failed to file returns to the questionnaire, and no evidence was offered at the hearing with respect to the character of such lines, the equipment used thereon or the nature of the traffic handled by them. In the absence of evidence in these respects the Interstate Commerce Commission expressed no opinion as to whether these carriers are subject to the act and the rules and instructions established thereunder. To such carriers the relief granted herein does not apply.

Atlantic City & Shore Railroad.
British Columbia Electric Railway.
Cincinnati & Dayton Traction Company.
Cincinnati, Lawrenceburg & Aurora Electric Street Railroad.
Dayton & Troy Electric Railway.
Dayton, Springfield & Xenia Southern Railway.
Empire State Railroad.
Holyoke Street Railway.
Lake Shore Electric Railway.
New York State Railways (Rochester Lines).
Rochester & Syracuse Railroad.
Rockford & Interurban Railway.
Scioto Valley Railway & Power Company.
Trenton-Princeton Traction Company.
West Chester Street Railroad.
Youngstown & Suburban Railway.

The Interstate Commerce Commission found that the carriers listed below cannot properly be classed as street, suburban or interurban electric railways and are therefore subject to the locomotive inspection act, as amended:

Arkansas Valley Interurban Railway.
Bamberger Electric Railroad.
Chicago, Aurora & Elgin Railroad.
Chicago, North Shore & Milwaukee Railroad.
Des Moines & Central Iowa Railroad.
Detroit United Railway.
Fonda, Johnstown & Gloversville Railroad.
Illinois Traction, Inc.
St. Louis Electric Terminal Railway.
Interstate Public Service Company.
Lackawanna & Wyoming Valley Railroad.
Northeast Oklahoma Railroad.
Pacific Electric Railway.
Portland Electric Power.
San Francisco-Sacramento Railroad.
Southern New York Railway.
Terre Haute, Indianapolis & Eastern Traction Company.
Tide Water Power Company.
Waterloo, Cedar Falls & Northern Railway.
Sacramento Northern Railway.
Salt Lake & Utah Railroad.
Cedar Rapids & Iowa City Railway.
Utah Idaho Central Railroad.
Chicago, South Shore & South Bend Railroad.
Pacific Northwest Traction Company.
Yakima Valley Transportation Company.
Visalia Electric Railroad.
Petaluma & Santa Rosa Railroad.
East St. Louis & Suburban Railway.
Evansville & Ohio Valley Railway.
Grand Rapids, Grand Haven & Muskegon Railway.
Mason City & Clear Lake Railroad.
Pittsburg County Railway.
Toledo, Bowling Green & Southern Traction Company.
Washington & Old Dominion Railway.

At the hearing testimony was offered on behalf of the carriers attempting to show that some of the rules and exceptions included in the order of Dec. 14, 1925, should be changed in order to make them applicable to locomotives used on their lines. The commission decided that Rules 223, 225, 226, 227, 238 (d), 239 (b) and 253 should be given further consideration before they are made effective on locomotives used by such of these lines as are subject to the act, but that the remaining rules should be made effective promptly.

The order of the commission was that on and after the first day of June, 1927, except as otherwise specified, the rules and instructions for the inspection and testing of locomotives propelled by power other than steam, together with such tables, drawings and forms approved by said order of Dec. 14, 1925, shall be effective and shall be observed by each and every common carrier subject to the act aforesaid as minimum requirements except with respect to locomotives used on the lines particularly named below, the specified dates included in the rules 213 (b), 214 (a), 231 (f), 317 (a) 328 (a), 329 (a) and 337 shall be extended for a period of eighteen calendar months and until further order the requirements of rules 223, 225, 226, 227, 238 (d), 239 (b) and 253 shall not be effective.

The carriers referred to above are:

Arkansas Valley Interurban Railway.
Bamberger Electric Railroad.
Chicago, Aurora & Elgin Railroad.
Chicago, North Shore & Milwaukee Railroad.
Des Moines & Central Iowa Railroad.
Detroit United Railway.
Fonda, Johnstown & Gloversville Railroad.
Illinois Traction, Inc.
Evansville & Ohio Valley Railway.
Grand Rapids, Grand Haven & Muskegon Railway.
Mason City & Clear Lake Railroad.
Pittsburg County Railway.
Toledo, Bowling Green & Southern Traction Company.
Washington & Old Dominion Railway.
St. Louis Electric Terminal Railway.
Interstate Public Service Company.
Lackawanna & Wyoming Valley Railroad.
Northeast Oklahoma Railroad.
Pacific Electric Railway.
Portland Electric Power Company.
San Francisco-Sacramento Railroad
Southern New York Railway.
Terre Haute, Indianapolis & Eastern Traction Company.
Tide Water Power Company.
Waterloo, Cedar Falls & Northern Railway.
Sacramento Northern Railway.
Salt Lake & Utah Railroad.
Cedar Rapids & Iowa City Railway.
Utah-Idaho Central Railroad.
Chicago, South Shore & South Bend Railroad.
Pacific Northwest Traction Company.
Yakima Valley Transportation Company.
Visalia Electric Railroad.
Petaluma & Santa Rosa Railroad.
East St. Louis & Suburban Railway.

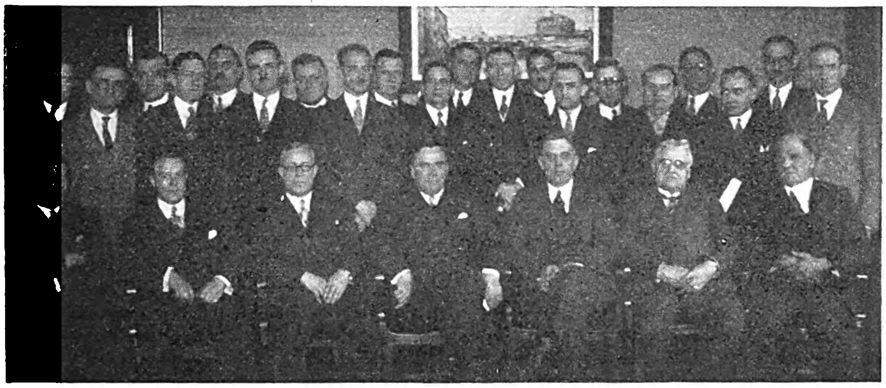
American Association News

Exhibit

PLANS for the annual exhibit at the 1927 convention were made and adopted at a meeting of the exhibit committee of the American Association held in the office of Col. J. H. Alexander, Cleveland, Ohio, on March 18. Those present were J. H. Alexander, chairman; C. E. Morgan, vice-chairman; T. O. Kennedy, vice-chairman entertainment committee; J. W. Welsh, executive secretary; F. C. J. Dell, director of exhibits; F. W. Campbell, secretary Cleveland convention committee; F. B. Bullock, assistant secretary Cleveland convention committee; J. W. Kellison, L. D. Bale, John Bender representing Herman Bender, C. P. Billings, R. M. Campbell, C. H. Clark, S. G. Down, Charles Gordon, R. N. Graham, H. F. Flowers, R. A. Hauer, C. S. Hawley, B. A. Hegeman, Jr., A. P. Jenks, J. E. Lytle representing H. J. Kenfield, A. F. Paul representing T. W. Casey, L. C. Paul representing J. C. McQuiston, A. L. Price, A. M. Robinson, S. P. Seward, L. W. Shugg and R. L. Twitchell. Mr. Dell was elected secretary of the meeting.

Mr. Dell presented a report outlining the work which has been done already. A contract has been drafted under which the exhibition is to function. In general this follows that of last year. The local contractors have been reappointed and the rates for service are in line with those quoted last year. Resolutions of the executive committee passed at its meeting on Feb. 4 were referred to, relative to outside bus demonstrations and other exhibits away from the convention, the setting aside of a special day for exhibits and arrangements for inspection trips. Mr. Dell's report was accepted and ordered spread upon the record.

Minutes of a special sub-committee to lay out a floor plan for the exhibit met at Cleveland on March 17. On account of building operations it was recommended to erect a temporary structure on East Sixth Street to be used as the exclusive entrance, with exits at the St. Clair end of East Third Street and at the St. Clair end of the auditorium



Representatives present at the meeting of the exhibit committee held in Cleveland, Ohio, March 18

on East Sixth Street. Several changes from last year's layout of meeting rooms and exhibit facilities were made. It was recommended to retain the Arena layout of last year. A plan for Exhibition Hall, the floor below the arena, was presented by the sub-committee and adopted. It was decided to provide rooms on this floor for meetings of the Accountants', Claims, Engineering and Purchasing Agents and Storekeepers. The balance of the space on this floor is to be used for exhibits. It was felt by the committee that this arrangement would be more satisfactory to exhibitors than that of last year.

The 1926 track layout was approved. Since a large car exhibit is expected, additional track space will be provided, if necessary, by closer spacing of the cars. The committee was in favor of stimulating by every means possible the exhibition of truck and car improvements by both manufacturers and operators. The chairman outlined a plan for squaring off the West Wing in the event that the Cleveland and Industrial Exposition's sale of space warrants. After discussion it was recommended that the meeting room space of last year be divided into exhibition space and that the American and T. & T. meetings be held in a new building to be erected on the north plaza, just north of the esplanade. If this building is not erected, it was voted that the meeting rooms of these two associations be retained in the same location as last year. In the event that the West Wing is extended, the committee voted authority to the director of exhibits to subdivide and sell the space to exhibitors. It was decided that Wednesday, Oct. 5, be designated as Exhibit Inspection Day.

Mr. Welsh outlined the budget for this year as compared with 1926 and explained that while the rental for the buildings will be reduced other expenses will increase. These include a greater expenditure for entertainment, general printing, including registration books not published last year, and contingencies. Having in mind that there was a deficit last year it appeared desirable to charge the same rates for space. It was voted to recommend to the executive committee rates of 75 cents per square foot for inside space, the same as last year; 45 cents per square foot for outside space and $3 per lineal foot for track space.

After considerable discussion a motion was passed unanimously recommending to the executive committee that the exhibits be opened at noon on Saturday, Oct. 1, instead of on the following Monday morning, when the convention itself is opened. Members of the committee representing various important exhibitors were in accord with this proposal, since it permits delegates arriving early to have additional time for inspection of the exhibits and tends to encourage early arrival by delegates and full attendance at the convention meetings.

It was voted that diagrams be prepared and contracts be submitted by Mr. Dell to prospective exhibitors on May 16, with the understanding that they have until June 15 to return formal space applications. It was further voted that a meeting of the committee for the purpose of assigning space be held in Cleveland at 10 a.m. on June 22.

W. & S. Special Committee No. 9

WAY and structures special committee No. 9 met in association headquarters in New York on March 2 and 3, with the following present: J. R. McKay, chairman; Adrian Hughes, Jr., L. F. Parlette, A. J. Blackburn, W. W. Wise, G. H. Haldeman and G. C. Hecker, association representatives.

Practically the entire meeting was devoted to a complete review and discussion of the effect of garage design on insurance rates. The tentative draft of the regulation for bus garages which has been prepared by the general garage committee of the National Fire Protection Association was carefully examined and discussed. Mr. Hecker, who is the association's representative on the N.F.P.A. conference committee on motor bus garages and hazards, explained the regulations and answered a number of questions concerning them.

It was decided that in addition to the assignment of garage design and its effect on insurance rates, the committee would consider only the three additional subjects of (a) door design, (b) bus washing facilities, (c) ideal layouts for various street frontage conditions. Sub-committees were appointed to obtain the necessary data for the investigation.

A tentative plan for a meeting in Pittsburgh in the latter part of April was proposed.

Service Betterment

REPORTS of sub-committees occupied the meeting of the committee on service betterment of the Transportation & Traffic Association held at association headquarters in New York on March 1. The following were present: S. E. Emmons, chairman; C. D. Smith, vice-chairman; A. C. Spurr, W. L. Barclay, Jr., representing E. A. Palmer, J. R. Ong representing J. B. Stewart, Jr., C. A. Burleson representing J. C. Thirlwall and W. B. Wheeler representing W. E. Thompson.

The meeting began with a report on "Convenience and Attractiveness of Service," by C. D. Smith, chairman of the sub-committee on this subject. Eight main topics were given consideration as essential. In the discussion which followed a number of additional topics were suggested for inclusion in an appendix to the report.

In the absence of J. A. Dewhurst, Mr. Smith also presented the report of the sub-committee on car design. In the discussion which followed quite a number of elements in car design were advanced as being very desirable in modern car design. The suggestions made covered in detail the following:

1. Adherence to A.E.R.A. standard double-truck car design.
2. Adequate ventilation should be more carefully studied.
3. Noise reduction should be carefully studied, taking into consideration noises caused by gears, air compressors, brake rigging, etc.
4. Cars should be designed so that they may easily be kept clean.
5. Careful attention should be given to interior and exterior finishes.
6. Giving cars names instead of numbers, as the possibility of stimulating local interest and friendly comment on small properties.
7. Push buttons should be in convenient reach of every seat.
8. Cars should be comfortably heated.
9. Cars should contain a maximum number of cross seats, spaced far enough for comfort.
10. The question of de luxe seats should be considered.
11. Cars should be illuminated so as to give the most restful and efficient lighting to passengers.
12. The design of hand straps, hand stanchions, bell cords, register cords, etc., should be carried out to give the least offense to passengers.
13. Ample floor space should be provided for passengers during fare payment.
14. Aisles should be of liberal width.
15. Circulating movement of passengers should be provided whenever possible.
16. Side windows should be provided with shades.
17. Floor levels should be kept down to a minimum.
18. Double-truck cars are preferable to single-truck cars in selling service, even on the small properties.

The final report of the session on "Speeding Up Service" discussed eleven points which should be given consideration whenever the question of speed is taken up. Later discussion by the committee emphasized the difference between the viewpoints of the operator and the public on the problem of speed.

The News of the Industry

$300,000,000 Subway Measure Passed by New York Legislature

Following favorable action by the New York Assembly, the Senate on March 23 passed by unanimous vote the resolution for the constitutional amendment to extend New York City's borrowing capacity by $300,000,000 for subway construction.

With the passage of the $300,000,000 amendment came word that Mayor Walker was planning a speaking tour to make sure that people throughout the state should become acquainted with the merits of the proposal before the referendum next fall. He is to open his campaign at Niagara Falls, where he will address the Summer Conference of Mayors on May 31. Several other dates for speaking engagements upstate will be arranged.

Mayor Schwab of Buffalo and Mayor Hanna of Syracuse, both of which cities have stakes in the amendment on account of provisions for increasing their debt limits, will join Mayor Walker on the stump. Since they are Republicans it will be a non-partisan effort to get voters outside of the cities to ratify the measure.

McChord Report on Philadelphia Presented

Charles C. McChord's report on the transit situation of the city of Philadelphia was submitted to the Public Service Commission of Pennsylvania on March 23. He suggests acquisition by condemnation of the underliers of the Philadelphia Rapid Transit Company as a step toward the city's becoming landlord of the existing system. He further suggests "condemnation of the P.R.T." While he apparently regards these steps as essential, he says that the rest of the plan should be carried forward immediately so as to achieve at once the following results:

1. Immediate operation of Broad Street subway without increase in fare.
2. Limitation of P.R.T. earnings to present dividends with payment of all surplus to the city.
3. Provision for increased sinking fund, sufficient by 1957 to purchase the P.R.T.
4. Local initial control by the city of all questions of service, fares and finance.

He would set up as a machinery to accomplish these results a local body with some such name as the Philadelphia Transit Conference Board, to consist of three members, one to be appointed by the city, one by the Public Service Commission and one by the company.

He says that it may be the wisest plan to acquire the underliers by condemnation with borrowed money and to acquire the P.R.T. in 1957 under the 1907 contract option "with the accumulated surplus." He feels that this latter step should be coupled with a definite limitation of dividends and complete control by the city of all the railway company's surplus earnings.

Through the direct expedient of underlier condemnations Mr. McChord sees an annual saving of $4,500,000 in the charges against gross revenue. According to him, this saving would be sufficient to permit a substantial reduction in present fares and very possibly an early return to the 5-cent fare "if this is desired."

Mr. McChord and his staff have been engaged in the survey for the last three months. During this same period the engineering bureau of the commission has been at work on a survey of service conditions of the Philadelphia Rapid Transit Company. A report based on these findings is expected to be filed within the next few weeks.

As the Philadelphia *Ledger* sees it, "the report justifies the hope that it will be made the basis for permanent adjustment of the relations between the city and the P.R.T., for it points the way not only to the lifting of the millstone of the rentals from the necks of the car riders but to a fair division of the cost of the city's high-speed transit facilities between the riders and the taxpayers."

Kansas City Franchise Passed

New 30-Year Grant in Favor of Kansas City Public Service Company Signed by Mayor—Reduction of Fares Effective Upon Franchise Acceptance

By a unanimous vote on the night of March 21 the City Council of Kansas City, Mo., granted a new 30-year franchise to the Kansas City Public Service Company. Mayor Albert I. Beach signed the document. It will become effective on March, 31, if accepted. The new franchise replaces the old franchise of the Kansas City Railways, known as the Jost franchise and passed in 1914 in the Jost administration.

Under the terms of the new grant a small reduction in fares is to be made immediately upon acceptance of the grant. The new rates will be fifteen tickets for $1, ten tickets for 70 cents. Until acceptance present fares, at the rate of two tokens for 15 cents and a cash fare of 8 cents, will remain effective. When purchased in the form of tickets in the larger quantities, fares will be one-third of a cent less than the present rates.

The city administration was for a time loath to grant any new franchise or an extension of the old one. With a change in the character of city government last summer, the new City Council granted a twelve-year extension to the Jost franchise, but a demand arose for a public referendum in the matter. Subsequently, the officials of the Kansas City Public Service Company asked that an entirely new franchise, mutually satisfactory to the city and to the operating company, be drafted and passed.

Since that time a special franchise committee of the City Council has been engaged in drafting a new instrument, details of which have been up for discussion almost every week in hearings to determine the public attitude toward the various tentative provisions of the new grant.

W. G. Woolfolk, president, has indicated that the Kansas City Public Service Company will accept the franchise at once.

Some of the principal provisions of the new franchise follow:

Time limit of the grant is 30 years, replacing the old franchise, which had eighteen years of unexpired term.

Bus franchise is considered separate from this grant, the company being required to follow the provisions of the present bus grant, which has an unexpired term of 1½ years.

No valuation on the properties is stipulated, but a return of $2,000,000 a year is permitted, plus 8 per cent on any new capital invested.

Fares are to be: Fifteen tickets for $1; ten tickets for 70 cents; two tokens for 15 cents and one cash fare for 8 cents; conductors on all cars to have the $1 books of tickets for sale.

The universal transfer system must be continued after the manner now in vogue here.

In accepting the franchise, the company agrees to consider income from the fare schedule of the franchise sufficient compensation, without recourse to the State Public Service Commission for increase in fares.

When the fare-reduction fund reaches an amount of $100,000, fares must be reduced by one-sixth of a cent; any surplus over the stipulated $2,000,000 a year and 8 per cent of the new investment must be added to the fare reduction fund.

The company must spend $6,600,000 on the property within the next three years, half for betterment of the service and equipment and half in repairs only. The first of these amounts is to be added to the capital account, but not the second.

Ordinary maintenance and repairs are to be taken care of by setting aside 16 per cent of the gross income each year, in addition to the $3,300,000 mentioned in the preceding paragraph, the unused amount of the 16 per cent to revert to the fare reduction fund.

Before the company may undertake any program of extraordinary maintenance, and then only in great emergencies, it must set aside a reserve fund of $400,000, interest on which, at 5 per cent per annum, must be paid into the fare reduction fund.

Two members of the company's board of directors are to be appointed by the city.

Violation of any single provision will be sufficient reason to rescind the entire grant upon a vote of the City Council

The company may mortgage its property up to $17,500,000 plus 75 per cent of new capital invested.

Possible proceeds from the sale of any of the property are to be spent in improvements of the remaining property and cannot be considered in the capital account upon which the 8 per cent dividend is allowed; while such proceeds remain unspent as provided, the company must pay

5 per cent of the amount per annum into the fare reduction fund.

Should extraneous causes increase the average operating costs by 5 per cent in any one year, the company may apply to the Public Service Commission for an increase in fares.

Paving Relief Measure Lost in Grand Rapids

Despite the loss of the measure to relieve the Grand Rapids Railway, Grand Rapids, Mich., from some of the costs of paving between its tracks, submitted to the voters on March 7, the Grand Rapids *Herald* regards it as a far cry from the old days of universal antipathy to public utilities to the results of the election, "when 3,375 out of 7,987 who voted favored a measure for relieving the railway from a tax load." The *Herald* says that "twenty years ago no scheme that offered even a crumb to any utility corporation could have hoped for one out of ten votes in a municipal election, whereas Monday's results show more than 40 per cent favorable to the railway."

The proposal lacked only 815 votes to carry, being a majority proposition. Analysis reveals that the adverse vote was probably due to the short time permitted for the railway's campaign, after the issue was initiated, in which to inform and educate the voters. The wording of the amendment also is believed to have had something to do with negative voting. City officials and prominent citizens supported the amendment by speaking in its behalf, but they were faced with an optional clause in the amendment that left a doubt in the mind of the property owners of how the cost was to be apportioned in all paving contracts. This was difficult to wipe away. The belief exists now that even if there had been a clean-cut elimination of costs with the paving expense charged to the general tax fund, the result might have been different.

The day of the election was not conducive to voting. It was so rainy and dismal that many women voters friendly to the company were kept away from the polls. Another thing, a 2½ mills tax levy to aid the city in meeting major improvements was initiated just before the primaries and injected a factor into the campaign.

In commenting the *Press* said:

> The *Press* is of the belief that when voters have been cured of the delusion about a "guarantee" and are able to look at this problem in the right light, it will not be difficult to change the slight minority of Monday's balloting to a majority. But that will require a greater interest on the part of intelligent citizens than was displayed in the turnout at this primary.

The *Herald* said:

> Upon the matter of paving between street car tracks, the probabilities are that the point which was deemed strongest in favor of the proposition is the real cause of its defeat. Those who advocated the charter amendment [illegible] out that it would not assuredly r[illegible] the paving burden from the railway, [illegible] rather would place upon the City Commission the responsibility of deciding each individual paving project separately. Commissioner Sweet, who earnestly advocated the amendment, believed that the railway should continue to pay for paving on residence streets. But there was nothing in the proposed amendment which guaranteed such procedure. That being the case, the voters, in order to protect owners of residence property on car lines from being burdened with increased taxes, voted against the plan.

Decision Becomes Indecision in Iowa One-Man Car Issue

When the Iowa Supreme Court on March 15 handed down a decision affirming Judge Joseph Meyer of the Polk County (Iowa) District Court, who ruled in favor of the local street car men's union in their fight to prevent the institution of one-man car service by the Des Moines City Railway, it was thought the question was settled until 1940, the date of the expiration of the two-man car agreement between the car men and the traction company. But when the high court on March 19 withdrew the opinion "for correction" it was discovered that the justices had disposed of the one-man car controversy by quoting a section of the street railway franchise of 1916, which was succeeded and replaced by the new franchise adopted in 1921 and under which the Des Moines City Railway is now operating. While the court in its brief order withdrawing the opinion give no inkling of what changes it intends to make in the ruling, it is believed by attorneys familiar with the case that the court may be forced to reconsider the entire one-man car controversy and to decide it on its merits.

The franchise of 1916 provided "that in the operation of its railway by electricity each motor passenger car shall be in control of a motorman and a conductor." In the corresponding section on motive power in the 1921 franchise this clause does not appear. Neither is it contained in any other section of the franchise. Obviously, the court overlooked this in making its decision. Referring to the discarded franchise of 1916, the court emphasized that as long as the wording of the franchise was practically identical with that of the contract between the men and the company "all parties are bound thereby," and the court finds "no ground for equitable intervention." In this manner the court passed by the question of public policy raised by the company, which contended in its arguments before both the District Court and the Supreme Court that in a city where a service-at-cost franchise is in effect any contract which prevents the city from instituting economies which would result in lower fares contravenes public policy.

The one-man car recent decision was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 19, page 548.

Through Service on Fox River Line

The Aurora, Elgin & Fox River Electric Company installed half-hour through service from 6 a.m. to 11 p.m. connecting Aurora, Elgin and Carpentersville on March 20. John W. Gunderson, general manager, said the new schedule was in keeping with the company's policy to extend and improve its Fox River Valley service. Eight of the regulation interurban cars went into service, all one-man operated. Recent wage increases were in the nature of recompense for the added duties. Fares are scaled to the zone system, the passenger upon entering the car paying fare to a zone and upon leaving the car returning the stub to the operator. Coincident with this service, a de luxe motor coach system is to be put into effect between Elgin and Aurora, with a running time of an hour. A Fageol motor coach has been added to the equipment. Only one or two stops will be made between the terminals, affording faster time than the half-hour interurban system.

North Shore Announces Rate Increase

An increase in interstate passenger rates on the Chicago North Shore & Milwaukee Railroad, Highwood, Ill., from 3 to 3.6 cents a mile has been announced effective at once. The new rates are made effective by authorization of the Interstate Commerce Commission, acting on the petition recently filed by the company. However, it is announced, round trip tickets between Chicago and Evanston stations and Kenosha, Racine and Milwaukee will be sold at the present rates until April 1. Intrastate commutation rates in both Illinois and Wisconsin are in no way affected by the increase, it is pointed out. The new interstate rates will make the fare one way between the Chicago Loop and downtown Milwaukee $3.06, the same as on the steam railroads, which is 49 cents more than the present rate of $2.57.

Charles E. Thompson, vice-president, in commenting on the rate increase said that recent capital expenditures in giving the public additional service through construction of the Skokie Valley route, purchase of new equipment and extensive improvements had made the advance imperative. The new rates merely placed the cost of service on a parity with that of other carriers serving the same territory.

Philadelphia Ordinances Before Commission

Two ordinances passed by the City Council at Philadelphia, Pa., were signed by the Mayor on March 10. The first authorizes the removal of tracks from Filbert Street to make way for the city of Philadelphia-Pennsylvania Railroad boulevard and a $52,000,000 terminal development. The second gives to the Philadelphia Rapid Transit Company and the Pennsylvania Railroad bus franchise rights on the proposed boulevard. The agreement and bus ordinances now go to the Public Service Commission for approval. Signing of the agreement and ordinance by the Mayor was realized after more than a year of negotiations with the underlying companies of the Philadelphia Rapid Transit holding franchises in Filbert Street. The track ordinance authorizes the removal of rail from Filbert Street between Twelfth and Twentieth Streets. Filbert Street will become part of the Pennsylvania Boulevard connecting Broad Street with the new West Philadelphia station of the Pennsylvania Railroad. The Pennsylvania officials refused to carry out the improvement unless the tracks were removed. Abandonment of the plans meant that the plans for beautifying the city would fail.

New Jersey Paving Bill Becomes a Law

Senate bill No. 82, relative to paving obligations by electric railway companies, was passed on March 22 by the New Jersey Legislature over the veto of Governor Moore. The bill, which becomes a law immediately, states that whenever any street railway or traction company disturbs the pavement of any street, road or highway for the construction, reconstruction, repair or removal of its tracks it must pay for the restoration of that pavement, including the base or foundation.

Work must be done to the satisfaction of the board or body having charge of such street, road or highway. A clause says that whenever any part of the pavement between the tracks and 18 in. outside of any street upon which is located the tracks has been or shall be damaged by reason of the operation of railway cars and such company at the time of the passage of this act is obligated to repair such damage and fails to repair, any state board or any political subdivision of the state having control of any such street may apply to the Board of Public Utility Commissioners for an order directing the company to make restorative repairs and this board is given jurisdiction to determine the reasonableness of any orders given.

Whenever any municipality, board or body having authority to do so shall pave or repave any street upon which are located the tracks of any railway, the company must at the same time and at its own expense put its tracks and track structure in good operating condition, but is not compelled to put down new paving around its tracks. Continuing, the bill reads:

> The obligations imposed by this act shall be and are in lieu and substitution of any and all other obligations of any such company to pave, repave or repair any street, road or highway, or to pay any part of the cost thereof except as herein provided, and may be enforced in the same manner as similar obligations are or may be enforced under the laws of this state. Nothing herein contained shall be construed to relieve any such company from the repayment of any money which has heretofore been advanced or expended by any state, county or municipal board or body having control of streets, roads or highways, for any paving heretofore done under and by virtue of a specific contract or agreement made and entered into between any such board or body and such company providing for the repayment thereof, but the obligation for such repayment shall be and remain enforceable as if this act had not been passed.

Prizes Offered for Buffalo High School Art Students

An art poster contest open to all students of Buffalo high schools is now under way, conducted by the art department of the public schools and the International Railway, Buffalo. The contest closes March 25. The winner will be announced on April 1. Prizes will be awarded as follows: $25 first prize, $15 second prize and $10 third prize. The designs submitted are to be in two colors of suitable size for display purposes in the company's cars. The subjects selected are to be some interesting or outstanding points of Buffalo or the Niagara Frontier which can be reached by I.R.C. cars or buses. The purpose of the contest is to stimulate interest in the scenic and historical points in Buffalo and the Niagara Frontier.

North Shore Line Erects Illuminated Signboard

In carrying its message of speed to the public traveling between Chicago and Milwaukee the North Shore Line is using a novel advertising medium in the shape of a "scene in action" sign. It is an electrically illuminated sign, the high-speed electrically operated train being painted in colors on glass. A patented disk revolving around the light to the rear makes the train appear in motion, "full speed ahead." These signs are being displayed with telling effect in various stations and store windows throughout the territory served by the company.

M. O. Advocates Urge Traction Fund for Car Line Purchase

Appropriation of the $45,000,000 traction fund of the city of Chicago for the purchase and construction of local street car lines, as opposed to its use for downtown subway building, is the plan advocated by the Detroit Traction Plan Purchase Club in a report issued on March 8 announcing its proposal for solving the city's transportation problems by resort to municipal ownership.

In launching a campaign for city ownership of the entire surface lines system, the club, which was organized in January, urges that the city acquire these properties on the same basis the city of Detroit purchased its railway lines in 1922. According to the club's report, no constitutional amendment or new legislation, such as required by the joint surface and elevated lines franchise which is now awaiting action in the City Council, would be necessary in event of purchase by the city. Neither would it be necessary for the city to borrow money to make initial payment, if the traction fund should be appropriated, it is urged.

The plan proposes that the city take over the lines under contract, the companies to retain title until the property is paid for in installments from earnings. The purchase price would be the actual cost of the property now used and useful for street railway purposes, less depreciation from time to time.

In the purchase plan, it is also suggested that the present $16,000,000 depreciation reserve of the companies be deducted from the suggested $75,000,000 valuation, leaving a purchase price of $59,000,000. The municipal ownership advocates would have the city pay $40,000,000 from the traction fund as down payment, leaving $19,000,000 to be paid off in installments from operating profits. The remainder of the traction fund, they maintain, could be used in making immediate extensions and improvements.

With the estimated net receipts of $12,000,000 of the surface lines, the remaining $19,000,000 of the purchase price could be paid off in about five years, the plan suggests, and "leave over $7,000,000 a year to use in making extensions, improvements and renewals from earnings."

Akron Rerouting for Economy

Beginning March 16 the first of the proposed rerouting changes in the bus transportation system of the Northern Ohio Power & Light Company, Akron, Ohio, became effective. Changes were made in the Summit Hill, Diagonal Road and the Brown Street-Lover's Lane line.

In discussing the changes in the issue of *Service News* for March 19 the company says:

> Every car and bus rider in the city of Akron is interested in keeping down fares.
>
> So is the Northern Ohio Power & Light Company!
>
> The lower car fares can be kept the better off all of us are. It is a community interest.
>
> Because of this a number of changes have been suggested in an effort to cut down the mileage that has been growing more and more month by month without a corresponding increase in riding. By cutting down the mileage, costs can be reduced and this naturally helps hold down fares. At the same time headways can be improved without much additional expense if the present duplication of service is eliminated.

Accidents Reduced in New Orleans

Street car accidents in New Orleans, La., have virtually been cut in half since April, 1924, when the New Orleans Public Service, Inc., started its safety first campaign. The company awards a safety pennant to the carhouse which shows the lowest percentage of accidents each month. Thus far the Poland carhouse has won the pennant fifteen times and the Canal carhouse twelve times. Reduction of accidents in last four years is shown in the following figures announced by the company:

	1926	1925	1924	1923
Street car accidents......	4,729	5.774	7,260	8,509
Accidents per 100,000 passengers............	3.5	4.4	5.58	6.36
Accidents per 100,000 car-miles................	34.1	41.8	52.2	58.3

Vote of People Required in Tacoma

Mayor M. G. Tennent and the City Council of Tacoma, Wash., have signed an agreement not to enter into a purchase contract with the Tacoma Railway & Power Company without a vote of the people, nor to relieve the company of any franchise requirements, nor to increase the tax levy above that of the current year. The resolution was offered to kill all sorts of misleading statements made during the recent city charter campaign. Franchise requirements, which it is promised will not be altered without direction of the voters, are those regarding gross earnings tax, pavement between and along tracks and payment of half the cost of bridges.

"Street Railways—Major Method of Passenger Transportation"

Attention has been called by the New York Trust Company, New York, in the March issue of the "[illegible]" published by it, to the present [illegible] of electric railways. The writer [illegible]nds his readers this is still the major method of transporting passengers. Among other things the item includes a summary of the operating statistics of the 327 principal companies given in the bulletin of the American Electric Railway Association.

Brady Awards to Be Continued

Nicholas F. Brady has authorized the resumption of the Anthony N. Brady Memorial Medal awards, through the American Museum of Safety, to the American electric railway organization which does the most to conserve the safety and health of the public and its employees. The next award will be for the year ended Dec. 31, 1926. As in previous years, the American Electric Railway Association is giving its entire co-operation. A committee has been appointed from within the industry to determine the conditions of the competition; there is also to be a committee to pass on the award.

Franchise of Dallas Suburban Line Extended

The City Commission of Dallas, Tex., has voted to extend the life of the franchise granted to the Dallas Southwestern Traction Company to Dec. 31, 1927. The action was taken at the request of E. P. Turner, president of the company, in compliance with the provisions of the charter franchise granted the company and on payment by the company of $1,400 of the $15,000 fund originally deposited with the city when the franchise was granted. Mr. Turner pointed out that at least 82 per cent of the grading for the line has been completed, but that the company so far has been unable to dispose of its bonds. In the original franchise it was stipulated that the company must have completed 10 miles of the proposed interurban line from Dallas to Irving by a certain date, and this franchise has been extended from year to year. In the recent extension the City Commission reduced the mileage that must be completed from 10 to 5.

Work Started on $250,000 Chicago Terminal

Razing of a famous landmark of downtown Chicago—the Wells Street terminal of the Chicago Rapid Transit Lines, near Quincy Street—is nearing completion. The structure, which has seen 25 years service, will be replaced by a $250,000 passenger station for patrons of the West Side elevated lines and the Chicago, Aurora & Elgin interurban line.

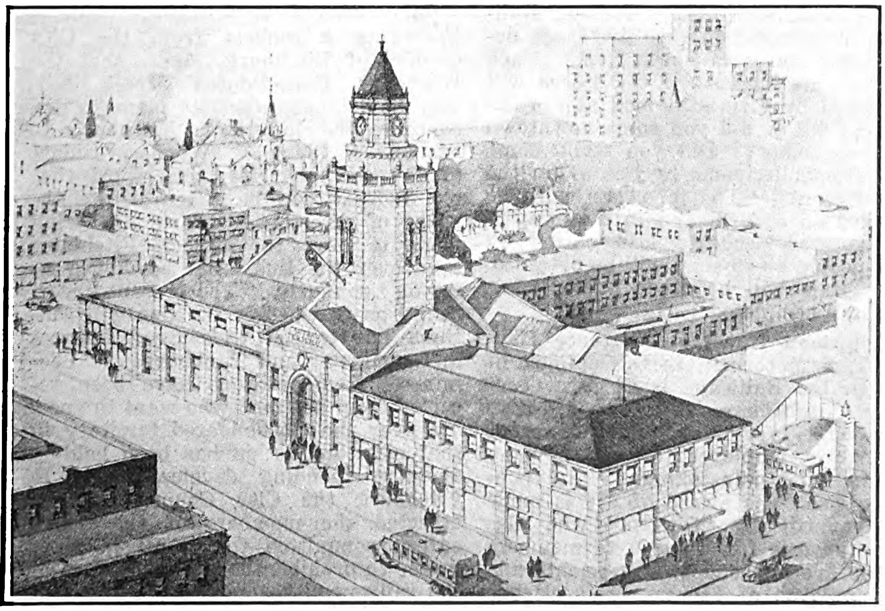
The new terminal has many unusual features. The waiting room will be on the third floor at train level. On the mezzanine floor will be a ladies' restroom, men's smoking room and trainmen's room. Space on the main or street floor will be given over to a ticket office, telephone booths, restaurant and concession counters.

A block-long, glass-inclosed steel bridge is to be erected along Wells Street, linking up the new third rail terminal and the Quincy Street station on the "L" loop. This means that passengers will be able to disembark from "L" trains at Quincy, walk a block sheltered from the weather, and step on to their suburban trains without descending to the street level.

Terminal Under Construction in Seattle

Active construction on the proposed $500,000 interurban and bus terminal for the Pacific Northwest Traction Company in Seattle, Wash., has been started by the engineering department of Stone & Webster, working under the direction of W. D. Shannon, chief engineer. This terminal, to be built for the subsidiary company of the Puget Sound Power & Light Company, maintaining head offices in Seattle, and of which Alton W. Leonard is president, will be of fireproof, class A construction, covering an area 62 ft. x 260 ft., two stories in height It will be located on the south side of Stewart Street, covering a block from Eighth to Ninth Avenue.

Plans for the improvement were prepared by John Graham, a Seattle architect, who has designed other utility structures, including substations for the Puget Sound Power & Light Company. Mention of this project has been made previously in the pages of the ELECTRIC RAILWAY JOURNAL.



Interurban and bus terminal to be erected in Seattle

Vote in Detroit Deferred

The plans of the Rapid Transit Commission to bring the question of subways before the voters of Detroit, Mich., at the April 4 election have been delayed. Action rescinding authority to submit the proposal was taken after Mayor Smith had pointed out possible obstructions. The plan was to construct and equip the so-called Woodward-Fort and Grand River-Gratiot subways at a total cost estimated at $125,000,000.

The Rapid Transit Commission acquiesced in the suggestion, but expressed regret that conditions seemed to make the action necessary. Mayor Smith stated that the complete lack of interest on the part of the people at the election on March 7, together with questions that have been raised, tending to cloud the issue in their minds, moved him to ask the postponement. It is further cited by the Mayor that the employment situation in Detroit is such that the mental attitude of voters might be unfavorably influenced toward undertaking large city projects.

The Rapid Transit Commission was commended by Mayor Smith for its work. He said that the recommendation for a postponement was in no way to be considered as disapproving its labors. The commission will continue its work and if, in the fall, untoward conditions do not exist the matter will be brought up again for the consideration of the Mayor and City Council with a view to putting the question to a vote.

It was the feeling of some of the city officials that the proposal was not sufficiently understood by the public to assure a favorable vote. The plan was condemned by the Mayor's finance committee in a recent report which urged that nothing be done until further study had been made. Full-page advertisements were being run in the local papers indicating the routes of the proposed system, the distribution of total cost between general taxation, special assessments and mortgage bonds, and the application of the special proximity assessments and the scale of rates recommended.

Last Five-Cent Fare Line in Massachusetts Passes

The last electric railway in Massachusetts operating under a 5-cent fare notified the State Department of Public Utilities on March 15 that its financial condition will no longer permit such a fare and that it proposes a new fare schedule to become effective on April 15. The road is the Union Street Railway, New Bedford, which has continued the low fare except to Dartmouth and Westport, where the fare has been 10 cents long after all other electric railways increased rates. It now proposes to charge a 10-cent fare throughout.

Under the old fare the company has sold tickets at the rate of twenty-one rides for $1, except to Dartmouth and Westport, where the ticket rate has been 7½ cents per trip. The tickets to Dartmouth and Westport will be continued at the same rate, but the strip tickets in the territory generally will be sold at the rate of four rides for 25 cents, or 6¼ cents per ride.

California Companies Seek Fare Increase

The Peninsular Railway, operating in the vicinity of San Jose, has applied to the Railroad Commission for an increase in rates. It alleges that the present rates are inadequate, that the utility had a net operating loss during 1926 of $90,952 and that its properties have a reproduction cost as of Dec. 31, 1926, of $4,525,082. Applicant asks the Railroad Commission to establish rates that will produce a fair return upon its investment in addition to operating expenses and fixed charges.

The San Jose Railroads, operating a street railway system in the city of San Jose and vicinity, has applied to the Railroad Commission for an increase in rates, alleging that it had a return during 1926 of only $12,245 and that its properties are estimated to have a reproduction cost as of Dec. 31, 1926, of $1,588,099. The commission is asked to establish rates that will produce a net return of 8 per cent.

The Stockton Electric Railroad has applied to the Railroad Commission for an increase of its rate of fare on its lines in the city of Stockton and vicinity, stating that the present fares do not produce a reasonable return upon the investment. The applicant sets forth that its properties have a reproduction cost new as of Dec. 31, 1926, of $1,160,461, and that it had a net income during 1926 of $30,089. It seeks a fair return upon the investment.

News Notes

Continuance of Sale of Tickets Ordered.—The Public Service Commission of Pennsylvania on March 8 instructed the Schuylkill Railway, Pottsville, Pa., to continue to sell reduced rate ticket books containing seventeen tickets for $1. The order was issued following a complaint of the Merchants' Association of Shenandoah and the Borough of Shenandoah against a new tariff rate in which the company planned to discontinue the sale of tickets.

Men Seek Wage Increase.—Trainmen of the Memphis Street Railway, Memphis, Tenn., are seeking a wage increase of 10 cents an hour. Under the contract signed last year, the wage section of which expires on April 1, the scale in cents per hour is, first year men, 47½; second year men, 52½, and third year men and older, 57½. Sections of the contract pertaining to working conditions will remain in effect for another year.

New Station Opened.—The new Seventh Avenue station of the Queensboro subway, operated by the Interborough Rapid Transit Company, New York, N. Y., was opened officially on March 23 under an order of the Transit Commission. The service which formerly terminated at Fifth Avenue will be continued to Times Square. It seems destined to become one of the most important transfer points in the rapid transit systems. The platform is 480 ft. long and extends under 41st Street from Broadway to a point west of Seventh Avenue. At present the Queensboro subway and its branches carry about 28,000,000 passengers a year.

Wage Increase in Aurora.—Employees of the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., have accepted the two-year contract offered by the company, which gives them an increase of 2 cents an hour to a 62-cent basis for city force employees and a 4-cent raise to 64 cents for interurban employees. The present contract expires on June 1.

No Opposition to Fare Increase.—No protests were presented at the hearing before the Public Utilities Commission of Utah, at Ogden, on March 14 of the Bamberger Electric Railway's request to raise one-way and round-trip first-class fares between Salt Lake and Ogden 10 per cent. Officials of the road announced that the increase would not affect student tickets. They also testified that the present revenue falls short of bringing in 6 per cent on the investment by fully $150,000 a year. The increase, they said, will bring in only an additional $12,000 a year. It is understood that the road expects its bus line to ease the burden to some extent.

Fare Testimony in Council Bluffs.—Special Master Claude R. Porter began collecting testimony on March 1 in the federal court at Council Bluffs, Iowa, pertaining to the fare issue of the Omaha & Council Bluffs Street Railway. In 1924 the company obtained an injunction restraining the city of Council Bluffs from interfering with increased fares the company proposed to put into effect. The city thereupon took an appeal to the United States Circuit Court of Appeals and this court sustained the injunction. The reasonableness of the fares is now up for determination. The issue involves the value of the property used in the public service, revenues, expenses and net income.

Traveling Habits Will Be Disclosed.—Information on the traveling habits of the shoppers of South Bend, Ind., is to be sought shortly by the Chicago, South Bend & Northern Indiana Railway in co-operation with five large department stores in South Bend. Each patron entering one of the stores will be asked by girls stationed at the entrance: "How did you come downtown to shop today? Did you walk, come by automobile, come by bus or on the street car?" The answers will be checked on a form and in this way it is expected accurate information on how people go to shop will be obtained. The totals will be made public when they are completed.

Motorman Honored.—Clarence Hayworth, a motorman in the employ of the United Railways & Electric Company, Baltimore, Md., has been awarded $50 for making the best record among the employees of the company in rendering painstaking, helpful public service. The award of $50 is made anonymously by "Citizen," who also made awards for bravery to members of the fire and police departments and an employee of the gas and electric company. The year for which the awards are made ended March 1. Mr. Hayworth was selected specifically for the assistance he rendered elderly persons, especially women, in boarding and alighting from his car. It was said that on one occasion he left his car to assist an aged woman into a church. The award is the fifth that has been made by "Citizen" and on each previous occasion it went to a conductor with one exception, when it was given to the operator of a one-man car.

Students Paint Car.—Students of Rice Institute at Houston, Tex., have painted and decorated a car of the Houston Electric Company in regular operation on the line that serves the institute. The colors are those of Rice Institute, with large owls on the sides and ends of the car. The Rice students are known as "Owls" and all their athletic teams play under this moniker. This is the first time, it is believed, that an electric railway has lent its cars to the decorative ideas of a college.

Seek Car Line Extension.—Residents of the Lakewood Heights addition to the city of Dallas Tex., have drafted demands for presentation to the new City Commission to be elected on April 5. These demands include an extension of the car lines of the Dallas Railway & Terminal Company. A bus line is now operated by the company from the terminal of the car line through the Lakewood Heights addition to White Rock lake, but this bus service is termed inadequate.

Lecture Meetings Arranged.—The Foremen's Training or Service Club was formed recently by employees of the Utah Light & Traction Company, Salt Lake City, Utah. This organization, which is composed primarily of foremen and supervisors in the various departments, meets every Saturday morning for the purpose of listening to lectures and discussing various subjects in connection with their own work. The lectures cover various subjects of broad scope, given by prominent citizens of Salt Lake City. Trainmen and other employees are invited to attend these meetings.

Commotion Over Fitchburg Line.—Following a request from the City Council of Fitchburg, Mass., that the Worcester Consolidated Street Railway hold in abeyance its plans to discontinue the line from Fitchburg to Worcester, Clark V. Wood, president of the company, has sent word that the request will be taken before the board of directors. Efforts are being made to have the city of Fitchburg take over the line from Fitchburg as far as Leominster. The present uncertainty as to whether the line will continue has caused widespread interest in Leominster and Fitchburg. In Leominster four petitions have been received from bus men who want to operate over the Consolidated territory in that city, but action has been held in abeyance pending developments. In Fitchburg the City Council has instructed the members of the public safety committee to do all in their power to prohibit the discontinuance of the railway either temporarily or permanently.

Recent Bus Developments

Railway at Indianapolis Said to Seek Coach Company

Details of contracts for purchase of the Peoples Motor Coach Company, Indianapolis, Ind., by the Indianapolis Street Railway are being worked out, it is said. The bus company now operates four main lines, some in direct competition with the railway's own motor bus routes, and has petitions before the Indiana Public Service Commission for other lines. It is said the railway would take over the buses and all leases and assets of the coach company and assume responsibility for payments of $100,000 on buses.

It was learned that the general value of the buses such as those used by the motor coach company has been held at about $10,000 to $12,000 each. With a total of 37 buses the value of the physical property of the company would be approximately $440,000, leaving approximately $60,000 to be charged to garage equipment and supplies and good will and for the certificate, if the price of $500,000 which has been mentioned is agreed upon for the deal.

Truck Competition Hearings Held in Chicago

The Illinois Commerce Commission is soon to decide if it shall establish the precedent of permitting motor truck systems to operate as freight-hauling agencies in competition with railroads, as a result of a hearing on petitions which opened in Chicago on March 10 before Commissioner J. Paul Kuhn. Complaints have been filed by several railroads operating out of Chicago against the operation of the Interstate Trucking Company without a certificate of necessity and convenience from the commission. The trucking company has filed a petition for such a certificate.

Rules Buses Operating Through Park Are Poor Man's Rolls-Royce

The Minneapolis, Minn., park board acted "reasonably and within its rights" when it gave bus companies the right to transport passengers over city parkways upon payment of a tonnage fee to the board, according to a district court decision. The ruling was made in connection with the motion of A. S. Dowdall, as citizen, to have the fee ordinance voided.

"The parks and parkways of the city," Judge Leary declared in his decision, "are for the recreation and enjoyment of the public—for those who can view their beauties as well from a bus as from a Rolls-Royce."

The bus concession ordinance, Mr. Dowdall contended, not only is a menace to the rights of the public but also extends to commercial transportation companies privileges beyond the powers and contrary to the traditions of the Board of Park Commissions.

The ordinance in question was passed by the park board in November of last year. It grants bus companies the right to operate through the city parks or parkways upon receipt of a permit and payment of a fee at the end of each year. This fee is limited to a minimum of $10 and a maximum of 20 per cent of the state motor vehicle tax for the particular bus.

Buses Will Replace One-Man Cars.—The Portland Electric Power Company, Portland, Ore., will substitute buses for the present one-man cars now in operation in the Parkrose district. The Parkrose line is to be torn up to make way for a new paved roadway along the east end of Sandy Boulevard.

Would Substitute Buses.—The Public Service Commission has granted the petition of the Westchester Street Transportation Company, Inc., to substitute buses for street cars on what is known as the Rosedale route in White Plains. At the hearing of this application, it was shown that by the use of buses connections could be made with the New York, Boston & Westchester line.

Would Extend Bus Service.—Expansion of the bus system of the Rochester lines of the New York State Railways is indicated in the petition to extend its Rochester-Penfield line to the villages of East Penfield and Marion and a movement for bus service in the Ridgeway Avenue section of Rochester. The petition for extension of the Penfield line was made to the Public Service Commission by the Rochester Interurban Bus Company, a subsidiary through which the railway operates its interurban bus system. Citizens of Ridgeway Avenue have applied to the Council for bus service.

New Service Schedule May Be Installed. — The Connecticut Company may install permanently a new type and schedule of service between New Britain, Conn., and Berlin, Conn., if the trial service started on March 6 meets the general requirements and approval of the traveling public. Under the plan buses will leave New Britain every twenty minutes and every other bus will continue to Meriden, as at present, but will operate through Franklin Square, New Britain. Service by trolley will be used to Berlin only when the traffic is heaviest.

Abandons Coach Lines.—The Pacific Electric Railway, Los Angeles, Cal., has been authorized by the Railroad Commission to abandon operation of its Clearwater-Bellflower, its Rosemead-San Gabriel and its Del Mar-New Avenue coach lines. It was decided these lines were not required by public convenience and necessity. The railway has also been authorized to discontinue operation of its coach service between Twentieth Street and Long Beach Avenue in the city of Los Angeles and the Union stock yards.

Bus Services Enlarged.—The Sioux Falls Traction System, Sioux Falls, S. D., has taken over the operating rights of the Worthington - Sioux Falls Transportation Company, operating buses between Sioux Falls and Mankato, Minn., by way of Worthington, according to R. C. Mills, manager of the railway. The company plans to put on its own equipment about April 1, Mr. Mills said, and will add this line to its expanding motor coach service. The addition of this new route will give the Sioux Falls Traction System a total of 1,726 miles daily on its various intercity motor coach lines operating over six different routes and reaching into four states, South Dakota, Iowa, Nebraska and Minnesota.

Buses to Be Substituted.—The Worcester Consolidated Street Railway has decided to abandon its railway between Worcester and Webster, Mass., and will substitute bus service. The New England Transportation Company, bus subsidiary of the New York, New Haven & Hartford Railroad, is expected to furnish the bus service. It is also announced that the Worcester Consolidated would abandon service over its Blackstone Valley line between Worcester and Woonsocket, R. I. In this case also the New England Transportation Company will furnish transportation by bus.

Must Abandon Bus Service.—The Key System Transit Company, Oakland, Cal., has applied to the Railroad Commission for permission to abandon its bus service between Los Angeles Avenue and Spruce Street, and Alta Road and Spruce Street in Berkeley. This service was established under a franchise granted by the City Council of Berkeley on Sept. 14, 1926, with the approval of the commission, and it was proposed to operate said service for a period of 180 days to determine if the patronage of the line would warrant its continuance. The company reports that the earnings have averaged $150 a month, while the cost of operation has averaged approximately $1,160 a month.

Permit Granted.—The Board of Public Works has granted the St. Louis Bus Company, auxiliary of the United Railways, St. Louis, Mo., a permit to operate buses on Watson Road from Penrod Avenue to the city limits. It has taken under advisement the application of the same company for a permit on South Kingshighway between Delor and Devonshire Avenues.

Bus Service Suggested—Abandonment of the electric railway line connecting Springfield and Worcester, Mass., is proposed. Clark V. Wood, the president of the Springfield Street Railway, has petitioned the Transportation Board in Springfield for bus licenses to replace the trolley service. He said the bus line would parallel the present trolley line through Palmer, Brimfield and Southbridge. The electric line would still be run between Springfield and Palmer, but east of Palmer the removal of tracks and wires was deemed probable. This forms part of the New Haven Railroad's rehabilitation program, he said, and would be put in effect as soon as licenses could be obtained.

Financial and Corporate

Extension of Public Control at Boston Suggested

First official indication from the Massachusetts Legislature is that the public control period of the Boston Elevated Railway, Boston, Mass., will not be extended 50 years, as the Harriman commission proposed. An extension of 25 years is favored by the committees on metropolitan affairs and on street railways, sitting jointly. There are 30 members on these committees and twenty of them are in favor of the 25 years. Ten members may formally dissent. The discussion of the measure, as now framed, will be before the ways and means committee of the Senate.

A financial reconstruction is proposed by the committees along the lines suggested in the Harriman bill. In this refinancing there would be an annual saving of $1,061,813 in dividends and taxes. It is proposed to issue 4½ per cent 40-year debentures to be exchanged for the 7 and 8 per cent preferred stock; this would save the road $454,050 annually in dividend payments. Dividends on the common stock are to be reduced from the present rate of 6 per cent to a new rate of 5½ per cent. This would result in an additional saving of $119,397 a year. The saving on federal income taxes on the preferred dividend would be $225,920. The state franchise tax, amounting to $262,375 a year, would be saved.

Out of this annual saving the bill applies $250,000 to a sinking fund to extinguish the debentures, $750,000 a year for about three years to pay back what the company owes cities and towns on what they advanced when the company was running behind. After this indebtedness has been paid the $750,000 would be used for rentals and charges on the Governors Square subway and the Lechmere Square, Maverick Square and Huntington Avenue extensions, and it is suggested that this money be applied also to the purchase of the Revere branch of the Eastern Massachusetts Street Railway.

At present the reserve fund of the company is $2,132,495. It is proposed to use this to buy new equipment.

Five trustees are provided for, the same number as in the present board, and they would be elected for two, four, six, eight and ten years respectively at the outset, reappointments to be for a term of ten years.

Financial features are made contingent upon the approval of the Elevated stockholders. Their attitude toward the matter is of course not known, but it was argued some weeks ago that they should not be required to make the sacrifices in income return called for in the original 50-year bill, a measure which has been the subject of comment before in the JOURNAL.

Lake Shore Electric Sold

The Lake Shore Electric Railway, Cleveland, Ohio, was sold on March 23 to F. W. Coen and associates by the Union Trust Company, Cleveland, acting for E. W. Moore. Recently the company applied to abandon its line between Sandusky and Norfolk because of decreased receipts. A proposal was advanced to supply the residents of this section with a bus service operated by the Lake Shore Motor Coach Company, a subsidiary organized by the railway.

The Lake Shore Electric Railway, with general offices at Sandusky, covers 183 miles of territory operating in 25 cities and towns. It controls the Lorain Street Railroad and the Sandusky, Fremont & Southern Railway. F. W. Coen, one of the new owners of the line and a former official of the railway, has declared his faith in the future of the interurban in the growing freight business and in the decline in automobile competition owing to parking difficulties in the cities.

$3,027,694 Net for 1926 in Philadelphia

P. R. T. Gross Revenue, Including Eight Months of Taxicab Operation, Was $57,196,610—$20,285 Transferred to Surplus—Estimated Earnings by 1930 Are $70,000,000

PASSENGER revenue of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for 1926, including subway-elevated, street cars and buses, with eight months of taxicabs, was $57,196,610. Operating expenses and taxes were $44,915,254. As usual there was a deficit on bus operation, through providing needed but unprofitable transportation service in the more sparsely settled areas of the city. This amounted in 1926 to $274,247. Taxicab net income for the eight months ended Dec. 31 was $198,339, being at the rate of approximately $300,000 per annum, thus offsetting the deficit from bus operation. After providing for payments to city sinking fund, rental for Frankford elevated, fixed charges, 7 per cent dividend on preferred stock and 8 per cent dividend on common stock, there remained $20,285 to be transferred to surplus.

In the annual report, issued under date of Feb. 28, the statement is made that the net income of the entire system for 1926 was $3,027,694. This figure was, of course, reached by adding to the net income of the Philadelphia Rapid Transit Company the net earnings of the taxicabs and subtracting the deficit due to bus operations.

During 1926 the company made considerable progress toward its goal of a fully rounded system of co-ordinated transit. It now co-ordinates every phase of Philadelphia's public passenger transportation, operating about 660 miles of surface track, 39 miles of elevated and subway track and 362 buses over a system of routes in Philadelphia which totals 244 miles and also connects Philadelphia with New York, Atlantic City, Baltimore, Washington and intermediate points. As a necessary step in co-ordination P. R. T. entered the field of taxicab operation by the purchase of the Yellow Cab Company, Philadelphia, for $3,000,000. More than 1,100 cabs are now operated,

INCOME ACCOUNTS OF PHILADELPHIA RAPID TRANSIT SYSTEM AS COMPARED BY THE "ELECTRIC RAILWAY JOURNAL"

	1926	1925
Gross passenger earnings	*$57,196,610	$49,911,702
Other operating revenue	830,942	691,883
Total	$58,027,552	$50,603,585
Maintenance and depreciation	$9,278,331	$8,760,903
Power operation	3,613,393	3,738,720
Conducting transportation	20,566,841	16,612,472
General	8,047,590	5,350,881
Taxes, including paving tax	3,409,097	3,070,879
Total	$44,915,254	$37,533,858
Operating income	$13,112,298	$13,069,727
Non-operating income	707,505	416,857
Total	$13,819,803	$13,486,585
Frankford Elevated rental and sinking fund—city contract	867,610	648,119
Total	$12,952,193	$12,838,466
Fixed charges, dividends, etc	$12,931,918	$12,525,459
Surplus	$20,285	$313,006

STATEMENT OF CAPITALIZATION AND INDEBTEDNESS OF THE PHILADELPHIA RAPID TRANSIT COMPANY AS OF DEC. 31, 1926

Capital Stock	Paid In	Unpaid	Total
Common	$29,996,235	$3,765	$30,000,000
7% cumulative preferred	13,982,600	4,017,400	18,000,000
Total	$43,978,835	$4,021,165	$48,000,000
Funded Debt:			
Collateral trust 5 per cent bonds due 1957			$4,108,000
Sinking fund 5 per cent gold bonds due 1962			576,000
Sinking fund 6 per cent gold bonds due 1962			8,933,000
Equipment trust series "D" 1919-1929			27,000
Equipment trust series "E" 1919-1929			87,000
Equipment trust series "F" 1922-1932			1,800,000
Equipment trust series "G" 1923-1933			3,325,000
Equipment trust series "H' 1924-1934			2,160,000
Equipment trust series "J" 1926-1936			1,700,000
Real estate mortgage			150,000
Total			$22,866,000

*Figures for 1926 include taxicab earnings for eight months while those for 1925 are based solely on electric railway and bus earnings.

STATEMENT OF WAGE TREND IN PHILADELPHIA

Calendar Year	Maximum Hourly Wage, Cents	Passengers Carried per Trainman	Calendar Year	Maximum Hourly Wage, Cents	Passengers Carried per Trainman
1911	23½	72,405	1919	58	137,785
1912	25	77,561	1920	72½	150,785
1913	30	85,762	1921	65	137,432
1914	30	89,790	1922	69	141,528
1915	30	96,106	1923	70½	146,658
1916	32	107,800	1924	71½	148,264
1917	35	113,940	1925	77	148,632
1918	48	120,102	1926	77	151,173

this co-ordination tending to protect the system against the inroads of competitive operation and consequent diversion of earnings to which electric railways are now being increasingly subjected. It was stated that the absorption of all taxicabs in the city, when effected, will work toward the elimination of cruising and a corresponding lessening of vehicular congestion in the streets.

Nine new bus routes, operating 127 miles, had been established during 1925. The system was further added to in 1926 by the installation of nine additional routes, operating 101 miles over city streets—a net addition of 32 per cent to P. R. T.'s route mileage accomplished within two years. In assuming the burden of the deficit incident to its bus operation the company has had in view the necessity of establishing a more complete transportation service to newly developed outlying areas, where population is not sufficient to warrant the expense of car tracks and where rubber-tired vehicles—with a seat for a fare—are necessary to supply a type of transportation more nearly comparable to the private automobile.

The company estimates that the system's earnings should reach $70,000,000 by 1930, of which 25 per cent may be earned by taxicabs and buses. If bus and cab service had not been developed by P. R. T., it is believed that 1930 would find the company with earnings entirely insufficient to enable it to supply adequate city-wide transit without endangering its own present financial position.

During this present year the company has purchased 218 new gas-electric buses. In 1926 P. R. T. purchased 50 new surface cars and 135 gas-electric buses. More than $2,000,000 was expended in constructing and equipping track extensions to the Sesqui-Centennial grounds. This was done with the twofold purpose in view of serving the exposition and of pushing forward the development of the too-backward southern section of the city. While the actual number of passengers carried to and from the Sesqui was only about 15 per cent of those for which provision was made, the immediate losses sustained by the company in this respect are not regarded as of a permanent character, but rather as an investment made in advance of the immediate needs of the section served.

The company extended itself during 1926 to meet the views of the city. The bankrupt Frankford, Tacony & Holmesburg Street Railway was taken over to supply increased feeder service to the Frankford "L." A single fare from the city center, by means of a free transfer with the "L," was extended northerly to Rhawn Street and a bus service with 10-cent fare and 3-cent exchange ticket was started to serve the sections from which the non-paying car lines were removed.

At the urgent request of the city the company agreed to increase its rental for the Frankford elevated from $780,200 to $936,850 per annum. The city desired that this be done in order that its borrowing capacity might be released to the extent of some $14,000,000, to accomplish which it was then necessary that the lease be extended to 1957. It was determined by the Public Service Commission to withhold its approval of this lease extension until the completion of its investigation now being conducted into P. R. T. matters. This decision was approved by the company.

Included in the report is a restatement of the three basic principles of Mitten Management, namely:

> *To the Public:* To furnish an adequate system of transportation, operated efficiently and courteously; to improve service to the fullest extent that improvement can be supported by the fare collected, and to offer the fullest opportunity to the car rider to share in the ownership of the property.
>
> *To the Employees:* To pay wages adequate to the necessities of life and comfort, and sufficient to permit of reasonable savings. To provide opportunity for participation in increased earnings made possible by the increased effort of the employees, and to encourage the investment of this added compensation in such a way as to make the employees owners as well as workers.
>
> *To the Owners:* To pay a reasonable return on the actual value of P. R. T. property, in justice to those who make P. R. T. possible, and to keep the credit of P. R. T. at a point necessary to support a high standard of public service.

Then follows a summary of accomplishments which have been made under these three heads during the sixteen years in which Mitten Management has been in charge of transportation matters in Philadelphia. These results are set forth in the comparisons shown in the following:

STATEMENT OF INCREASED RIDING IN PHILADELPHIA

Calendar Year	Revenue and Transfer Passengers	Rides per Capita
1911	517,697,478	329
1912	549,674,683	343
1913	580,011,057	357
1914	581,297,949	352
1915	594,220,409	354
1916	669,008,258	392
1917	726,936,340	419
1918	763,008,395	432
1919	866,944,336	483
1920	908,482,135	501
1921	836,547,351	451
1922	848,883,512	450
1923	918,775,871	480
1924	913,855,751	469
1925	926,928,994	468
1926	966,469,223	480

The P. R. T. report for 1926 is concluded with a reprint of an article on the "Underlying Companies of the City Transit System," by Edmund Stirling, a local newspaper authority on transit matters, which appeared in the *Public Ledger*. There has been much agitation in Philadelphia to eliminate the "underliers" and with them the heavy rentals which P. R. T. must pay each year. Whether this latter step could be accomplished without heavy payments which would wipe out any savings is frankly questioned, but, at any rate, P. R. T. officials, city authorities and the general public are all agreed that some step should be taken to place the original franchises and charters, now controlled by the underliers, under a unified ownership. To dispel the false notion that confiscation proceedings could be instituted against the underlying companies, P. R. T. has quoted Mr. Stirling, in part, as follows:

> The fairness and equity of these rentals are not here an issue. It is well known that the grant of the charters was in many instances clouded by corruption and the execution of the leases was attended by the infusion of a vast amount of water. Some of the contracts were deliberately made to escape tax and other legal obligations of the companies. But these maneuvers were all carried through under the forms of law, and the validity of the contracts and leases has been repeatedly confirmed by legislative action.

INCREASED RETURNS TO STOCKHOLDERS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Calendar Year	P.R.T. Surplus	Dividends on P. R. T. Stock Preferred Per Cent	Dividends on P. R. T. Stock Common Per Cent
1911	$358,250	....	....
1912	260,236	....	....
1913	676,849	....	....
1914	930,564	....	....
1915	1,128,017	....	....
1916	2,987,975	....	$1,348 656–4½
1917	4,345,900	....	1,499,277–5
1918	4,482,119	....	1,499,290–5
1919	4,482,532	....	1,499,290–5
1920	4,195,356	....	....
1921	5,748,980	....	....
1922	5,640,664	....	1,799,148–6
1923	5,616,833	....	1,799,148–6
1924	5,652,582	....	1,799,575–6
1925	6,178,916	$60,871–7	2,399,639–8
1926	6,489,188	607,766–7	2,399,644–8

> Had their legal status been assailed at the time, something might have been accomplished toward lifting the burden of excessive fixed charges from the car riders. But while the crookedness of transit policies and the selfishness of the financing methods of the street railway owners were notorious, the people went on electing officials who gave these transactions a binding force.
>
> Furthermore, the persons who profited by the juggling of street-railway leases and finances have long since disappeared from the stage. Their holdings were unloaded upon the public, until today it is doubtful whether any of the stocks and bonds of the underliers are held by the descendants of original purchasers. Bought as safe investments, under repeated guarantees, the greater part of them are to be found in trust estates. It is inconceivable that any court today would permit their condemnation at less than their present-day, fair market value. And if the effort to cancel the original charters were to be made, under the state's constitutional right to alter, revoke or annul charters of incorporation, that power and right are definitely limited by the same fundamental law, so that it can only be exercised in such a way that "no injustice shall be done to the corporators."
>
> Few will question the desirability of getting rid of the traction underliers. But only those agents of a selfish propaganda which is designed to confuse the public mind about the real facts of the case have dared suggest this can be accomplished by other than legal means and without doing justice to innocent investors.

Takes Over Another Line. — The United Railways & Electric Company, Baltimore, Md., will take over the Lorraine Cemetery car line on April 1 and improve the service. This line has been operated by the Lorraine Cemetery Company for some time.

New Members Elected to Eastern Massachusetts Board

At the annual meeting of the stockholders of the Eastern Massachusetts Street Railway, Boston, Mass., recently held, the following directors were elected:

Charles Hayden, Lester Watson, Roger Amory, Franklin T. Miller, Albert A. Harrison, Robert B. Stearns, Henry G. Lapham, A. W. Pinkham, L. Sherman Adams and Cornelius J. Corcoran. Only three of the former directors are carried in the new board. They are L. Sherman Adams, Roger Amory and Franklin T. Miller.

Charles Hayden and Lester Watson are members of the firm of Hayden, Stone & Company, which acquired a substantial financial interest in the company after the so-called Adams suit.

Balance in Detroit Shows Increase

The operating revenue of the Department of Street Railways at Detroit, Mich., for the year ended Feb. 28, 1927, was $24,651,578 against $23,756,099 for the year previous. These figures included a railway operating revenue of $22,213,412 and a coach operating revenue of $2,438,166 in 1927 against $22,734,840 and $1,021,058 for a railway and coach revenue respectively in 1926. Total operating expenses increased from $17,934,835 to $19,070,140 in 1927. The railway operating expenses decreased from $16,938,688 in 1926 and $16,788,206 for the year ended Feb. 28, 1927. Coach operating expenses increased from $996,147 for the year ended Feb. 28, 1926, to $2,281,933 for the year ended Feb. 28, 1927. Net revenue was $5,858,149 against $6,019,663 in 1926. Net income fell from $3,357,854 to $3,187,287 for the current year. The balance was $587,060 for the year ended Feb. 28, 1927, and $571,810 for the year ended Feb. 28, 1926. Total railway passengers numbered 476,716,753 in 1927 and 488,589,883 in 1926. Total coach passengers numbered 13,611,347 in the 1926 period to 30,714,819 in 1927.

Loss in Alliance in 1926

Abandoning buses, scrapping the machines which were practically worthless and disposing of antique equipment during 1926 increased overhead expenses for the Stark Electric Railroad, Alliance, Ohio, to $153,851 and resulted in a net loss for the year of $80,141. The financial summary as made public was as follows:

	1926	1925
Gross earnings	$460,865	$467,223
Operating expenses	387,155	361,474
Operating revenue	73,709	105,748
Taxes and fixed charges	153,851	113,631
Net Loss	$80,141	$7,882

From this summary it is seen that gross earnings in 1926 were nearly $7,000 less than 1925. Operating expenses last year were about $26,000 greater than 1925 and fixed charges about $40,200 greater.

Last year the Stark Electric Railroad, with about 30 miles of track, in addition to the city bus routes in Alliance was patronized by 2,845,996 persons, compared with 2,871,730 persons during 1925. Last year this number was divided, 1,897,101 being carried on interurban cars and 948,895 being carried on city cars. In 1925 interurban patrons were 1,965,228 and city patrons 906,502.

During the greater part of 1925, when the larger number of passengers were transported, street cars were operated in Alliance on a regular schedule over about 2 miles of city lines. During the latter part of 1925 and the majority of 1926 buses were used.

For 1927 the outlook is very good for a small loss or a possible profit. This is due mainly to steps taken by the company during the last few months. Discarding buses, which proved a loss instead of a gain, and returning to street cars is believed to be a big step in reducing the operating cost due to the large expenses in maintaining buses. At the same time the company abandoned a number of old cars.

Although it serves two cities and one fair-sized town, the Stark Electric operates city cars only in Alliance. Interurban service is run between Canton and Salem, in addition to the city cars in Alliance.

New Directors at Louisville.—At the annual meeting of the stockholders of the Louisville Railway, Louisville, Ky., Ralph C. Gifford, vice-president of the First National Bank, and William C. Campbell, manager and chief engineer of the Kentucky & Indiana Terminal Railroad, were elected directors. S. T. Culver, an interurban motorman, became employee representative on the board, to replace J. J. Blackerby.

Net Income Increases.—For the eight months period ended on Feb. 28, 1927, the total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $30,714,101, against $29,522,318 for a similar period of the previous year. Total operating expenses increased from $19,249,877 to $19,829,161 for the eight months period ended Feb. 28, 1927. After a consideration of income deductions a net income remained of $4,137,106 for the eight months ending Feb. 28 of the current year, against $3,648,345 in 1926.

Line Will Be Abandoned.—General Manager John McIntosh announced recently that in consequence of an annual operating deficit of $30,000, the Chicago & Interurban Traction Company operating from 63d and Halsted Streets, Chicago, to Kankakee, Ill., will be discontinued before April 30. Failure of the line to pay, he said, was in part due to automobile competition and in part to being forced to pay the same high wage scale as that received by employees of Chicago surface lines. Coincident with the announcement was the granting by the Illinois Commerce Commission to the Schappi Bus Lines, Inc., an Insull company, of a certificate permitting it to operate between Chicago Heights, Halsted and 63d Streets.

Abandonment of Asbury Park Belt Line Authorized.—Abandonment of the inside belt line, operated by the Coast Cities Railway in Asbury Park, N. J., has been sanctioned by the Board of Public Utility Commissioners. Suspension of the service and surrender of charter has already been approved by a municipal ordinance. Evidence indicated the line is not well patronized and is operated at a heavy deficit.

Conspectus of Indexes for March, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares* 1913 = 4.84	Mar. 1927 **7.43**	Feb. 1927 **7.45**	Mar. 1926 **7.36**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Mar. 1927 **152.1**	Feb. 1927 **154.0**	Mar. 1926 **156.4**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	Mar. 1927 **226.7**	Feb. 1927 **226.7**	Mar. 1926 **224.1**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Mar. 1927 **203.0**	Feb. 1927 **202.9**	Mar. 1926 **202.0**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Mar. 1927 **208.8**	Feb. 1927 **210.2**	Mar. 1926 **207.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Feb. 1927 **146.4**	Jan. 1927 **146.9**	Feb. 1926 **155.0**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Mar. 1 1927 **12.55**	Feb. 1 1927 **12.52**	Mar. 1 1926 **13.40**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Feb. 1927 **156.0**	Jan. 1927 **159.3**	Feb. 1926 **161.5**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Feb. 1927 **165.2**	Jan. 1927 **166.9**	Feb. 1926 **169.5**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Feb. 28 1927 **3.597**	Jan. 31 1927 **3.800**	Feb 28 1926 **4.617**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Feb. 1927 **16.72**	Jan. 1927 **18.89**	Feb. 1926 **16.73**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Feb. 1927 **1859** **65.42**	Jan. 1927 **2227** **75.06**	Feb. 1926 **1669** **40.98**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Personal Items

Changes Among Chicago Division Superintendents

Three important changes in the ransportation department of the Chiago Surface Lines have been announced by the management. Michael Harrington, who has been in the service since 1884, resigned his position as ivision superintendent at the Kedzie epot, division No. 7, and took a furough from the service. R. J. McKiney, division superintendent at Elston epot, division No. 10, was transferred o Kedzie in Mr. Harrington's place, nd Walter M. Kroll, assistant superntendent of the tenth district, suceeds Mr. McKinney as superintendent n that district. E. E. Victorson, conected with the downtown supervisory orce, was made assistant division suerintendent to succeed Mr. Kroll.

Mr. Harrington entered the service s a horse car driver and became a motorman after the electrification of he lines. He was appointed supervisor n 1901 and made foreman at Kedzie epot in 1903. He became division uperintendent at Kedzie in 1914 and was sent to the general office as assistnt superintendent of transportation in 923, returning to Kedzie as division uperintendent two years later.

Mr. Kroll entered the Surface Lines ervice as a motorman in 1894 and has een foreman at the Elston depot, assistnt superintendent, assistant superinendent of train service employment nd division superintendent.

Mr. Victorson entered the service with the track department in 1905 and was transferred to the train service as conductor in 1910. He served in the rmy during the World War and upon is return was employed by the Elgin, oliet & Eastern Railway, re-entering he Chicago Surface Lines service hree years later as a starter at the Kedzie depot.

Deane Ackers Local Manager at Topeka

To fill a newly created position Deane Ackers, formerly local manager of the Kansas Power & Light Company's properties at Atchison, has been made ocal manager of the company's proprties in Topeka, it has been announced by A. M. Patten, vice-president and general manager of the company.

Starting in 1924 with the Illinois Power & Light Company, the parent ompany, Mr. Ackers was made local manager at Atchison, to succeed C. A. eland, Jr., who had been transferred o Topeka.

A graduate of the school of engineering at the University of Kansas n 1917, Mr. Ackers attended the first fficers' training camp and was commissioned a second lieutenant in the nfantry in August, 1917. Later he was promoted to the rank of first lieuenant and finally to the grade of capain. He served with the Sixteenth nfantry of the First Division.

After two years overseas, taking part in all engagements with the First Division Mr. Ackers returned to the United States in 1919. He joined the United Power & Light Corporation and had headquarters at Abilene with the position of construction engineer. He was there until 1924, when he joined the Kansas Power & Light Company.

Dr. A. A. Mitten Will Carry On Industrial Democracy

Dr. A. A. Mitten, whose succession to the chairmanship of the executive committee of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 19, page 548, has been the silent influence and power in the company's co-operative welfare and public relations work. He is as much at ease with a track employee as with an official and is eminently qualified to maintain contacts between men and management. His activity with the company began on May 1, 1919, when he became secretary of the Co-operative Welfare Association. Ever since that time he has taken an active part in the co-operative activities of the company and is personally known and highly regarded by thousands of the company's employees. At the same time Dr. Mitten became secretary of the employees' Co-operative Association he also assumed the duties of supervisor of welfare and employment.

A. A. Mitten

T. E. Mitten's only son was educated as a physician and surgeon. He entered the electric railway industry in 1915 as industrial surgeon with the company in Milwaukee. When the United States entered the World War Dr. Mitten went to France as a captain of an ambulance company, was twice severely gassed, was wounded and then captured in August, 1918. He was imprisoned at Villingen until after the armistice was signed.

On May 15, 1922, Dr. Mitten was elected a director of the company and he has served in that capacity without interruption since that time. Until his election as chairman of the executive committee he acted as secretary of the board of directors. Dr. Mitten has also served for several years as vice-president of Mitten Management, Inc., which operates both the Philadelphia Rapid Transit Company and the International Railway, Buffalo, N. Y.

Now the time has come around when T. E. Mitten sees fit to relinquish some of the overwhelming mass of details which constantly spring into being on a property the size of the Philadelphia one. For sixteen years Mr. Mitten has served as chairman of the executive committee. Now his son has stepped into this position. The father will continue as chairman of the board of directors of the company.

At the annual meeting of the stockholders at which Mr. Mitten relinquished his post to his son other officers, in the main, were re-elected. C. J. Kelley replaced W. D. Witt as auditor of the company. Coleman J. Joyce and Leon Jewell were replaced on the board of directors by J. A. Queeney and Ralph T. Senter respectively. However, both will continue their services with the company. As a matter of fact, no particular significance attaches to the absence this year of the names of Mr. Joyce and Mr. Jewell from the board of directors. It is a policy of the management to assign men to meet the exigencies of the particular situation at hand. When an expert on rates and valuation was needed on the P. R. T. board, Mr. Joyce was the logical man to fill the post. This year the Philadelphia problems will chiefly be matters of operation, while in Buffalo the questions of valuation and rate-fixing were never more pressing than at this time.

Andrew Marshall Resigns as Boston Elevated Trustee

Andrew Marshall has resigned as a member of the board of public trustees of the Boston Elevated Railway, Boston, Mass. He was appointed by Governor Fuller on Aug. 26, 1925, to succeed former chairman James F. Jackson, and it was the Governor's intention that he should serve as chairman of the board.

Mr. Marshall opposed the original proposition for the reorganization of the company because of the sacrifice which he felt would be imposed on the stockholders to obtain a 50-year extension of the public control law. He argued the case exhaustively before the legislative committee, and the 25-year control plan which finally came out of the committee is a little closer to what he urged, but it is not his plan and he has not expressed himself regarding it.

Mr. Marshall was not elected chairman of the board, as that designation was given to Samuel L. Powers by the other trustees, who contended that they, and not the Governor, had the power of electing a chairman.

In his letter of resignation to the Governor Mr. Marshall explained that the demands of his law practice, consisting in part of the trial of cases which occasionally are of extended length, are such that it is difficult to meet these demands and at the same time to perform the duties of the public trusteeship in a manner which he considered adequate.

It is understood that no successor to Mr. Marshall will be appointed by Governor Fuller until the Legislature has acted upon the pending plans for the reorganization of the Elevated.

S. B. Irelan Transferred to Kansas City

S. B. Irelan, vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., for the past four years, has been appointed Western manager of the securities department of the Henry L. Doherty interests, with headquarters in Kansas City.

In the course of his career he has been identified in an executive capacity with Doherty properties in almost every section of the country. From Denver he went to Fremont, Nev., and thence to New York to the engineering and statistical department, where he engaged in special work of revising the classification of accounts and report system. In 1914 he became vice-president and general manager of the Bartlesville (Okla.) utilities, but two years later he was transferred to Sedalia, Mo., in a similar capacity. From 1917 to 1923 Mr. Irelan was connected with the companies at Montgomery, Ala., which in the latter year were sold to the Alabama Power Company. It was at this time that he removed to St. Joseph as vice-president and general manager.

As manager of the securities department of the Western division, he will have charge of all the territory west of the Mississippi River.

Francis X. Sullivan was appointed to the Board of Transportation, New York, N. Y., by Mayor Walker, on March 23. The new incumbent succeeds William A. De Ford, a holdover from the Hylan administration, who resigned last November. Commissioner Sullivan has been prominent for many years as an attorney for labor unions and at present is counsel for the State Federation of Labor. He was graduated from Union College in 1901. From 1917 to 1921 he was Commissioner of Public Works in Queens. For two years he served as a member of the Home Rule Commission of New York.

T. H. Steffens, vice-president of the Sand Springs Railway, Sand Springs, Okla., for the past fifteen years, has succeeded the late Charles Page as president. Mr. Steffens has been with this property since its organization. Prior to that time he was connected with the St. Louis-San Francisco Railroad, St. Louis, Mo.

Ralph H. Love, manager of the Hiawatha, Kan., properties of the Illinois Power & Light Corporation, has been appointed local manager of the Kansas Power & Light Company's property at Atchison, Kan., to succeed Deane Atkins, transferred to Topeka. Mr. Love will continue in charge of the Hiawatha plant.

Changes Announced in New Jersey Property

Changes in personnel of the Public Service Railway and the Public Service Transportation Company, Newark, N. J., were announced recently by Arthur T. Warner, general manager in charge of traffic. They are: Morton H. Dean, formerly superintendent of time-tables, as traffic engineer; Herbert E. Conway, formerly traffic investigator, as superintendent of time-tables; Harold B. Whitman, formerly assistant manager, Passaic Division, as passenger agent.

M. H. Dean

Morton H. Dean, the new traffic engineer, began work for the Public Service in 1906 in the time-table department at Newark. Later he became a schedule maker and then chief clerk in that department. In 1925 he was appointed superintendent of time-tables.

Herbert E. Conway, who has replaced Mr. Dean as superintendent of time-tables, entered the Public Service Railway employ in 1910, upon leaving Stevens Preparatory School. He took a position in the time-table department and three years later was transferred to the traffic department as traffic investigator. In 1917 he returned to the time-table department as schedule maker and became chief clerk of that department in 1925.

H. E. Conway

Harold B. Whitman, passenger agent, became a checker in the traffic department after returning from the Mexican border in 1917. He served as sergeant in the Argonne during the World War and returned to Public Service in 1922, becoming superintendent of the Market Street carhouse in Paterson. He was appointed assistant manager railway and transportation, Passaic Division, Nov. 1, 1925, and recently has been attached to the traffic department in Newark.

Frank T. Freeman, who for the past two years has been superintendent of bus maintenance and repairs of the Public Service Transportation Company, subsidiary of the Public Service Railway, Newark, N. J., resigned on Feb. 25. At one time he was in the garage business in Florida and later he built and equipped a modern plant at Rahway for general machine, foundry and electrical contracting and automobile repair work. For many years Mr. Freeman has been identified with the maintenance of automotive fleets, having previously worked in that capacity with the Standard Oil Company of New Jersey and Kaufman's Department Store, Inc., Pittsburgh, Pa. Mr. Freeman has not announced any plans for the future.

Obituary

Wallace Heckman

Wallace Heckman, a vice-president of the Chicago Railways and former business manager and general counsel for the University of Chicago, died in Chicago on March 7. As a member of the operating board of the Chicago Surface Lines Mr. Heckman served as an arbitrator in several labor controversies involving the railways.

Mr. Heckman was born at Moscow Mills, Ohio, May 2, 1851. He was admitted to the Illinois bar in June, 1876, and from 1885 to 1908 was senior member of the law firm of Heckman, Elsdon & Shaw. In 1903 he was made counsel and business manager of Chicago University, which position he held until 1924, when he became associated with the Chicago Surface Lines.

Oren Joseph Smith, at one time chief engineer of the Denver Tramway, Denver, Col., died recently in Denver. He was 74 years old.

Joseph J. Heim, financier of Kansas City, Mo., and at one time an important figure in transportation, died in Kansas City recently after a year's illness. Mr. Heim's specialty was railway construction. With J. W. Ground, T. K. Irwin, W. W. Calhoun and Fred Fitch he constructed the Joplin & Pittsburg Railway, of which he later became president. Some ten years ago he was the principal owner in the Kansas City, Kaw Valley & Western Railway, which he also built. More than 30 years ago Mr. Heim built the East Side Railway of Kansas City at his own expense. The road extended from the north side business district of Kansas City to the East Bottoms district. An amusement park served by the railway was erected shortly afterward near the Heim Brewery.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Dr. Gilbreth Urges Psychological Test for Workers

Stressing the need for more attention to the psychological aspects of the worker when building an effective industrial organization, Dr. Lillian Gilbreth, of Gilbreth, Inc., consulting engineer, New York City, made the principal address before the New York Railroad Club in the Engineering Societies Building on March 18. Mrs. Gilbreth is one of the three women members of the American Society of Mechanical Engineers.

In the opinion of the speaker, the first step necessary in building an effective organization is to inculcate a healthy philosophy toward work. The worker is pessimistic, especially when production is being pushed. He has an undeveloped economic theory. He must know whether or not he is going to suffer if he increases production. From the standpoint of the speaker, motion-study, stop-watch analyses are not half so effective as a deep study of the psychological effects caused by the pressure of work, worry, friction, fatigue, financial troubles, isolation, and lack of appreciation. Dr. Gilbreth also pointed out that a man might display ability for a certain job, yet not like the job, because it had no emotional appeal for him.

It is highly important to determine whether the nervous stability of the worker is of the kind that would make him benefit by the work he is engaged in. After such studies are made, and the man selected on the basis of these psychological facts, then the workers must interlock in so far as their jobs are concerned. In other words the worker must be teaching the man below him, while he is learning the job up ahead of him. Dr. Gilbreth laid great emphasis on the necessity of making a study of machines before planning better methods. In her opinion, the betterment of machine design has never been given the attention it deserves.

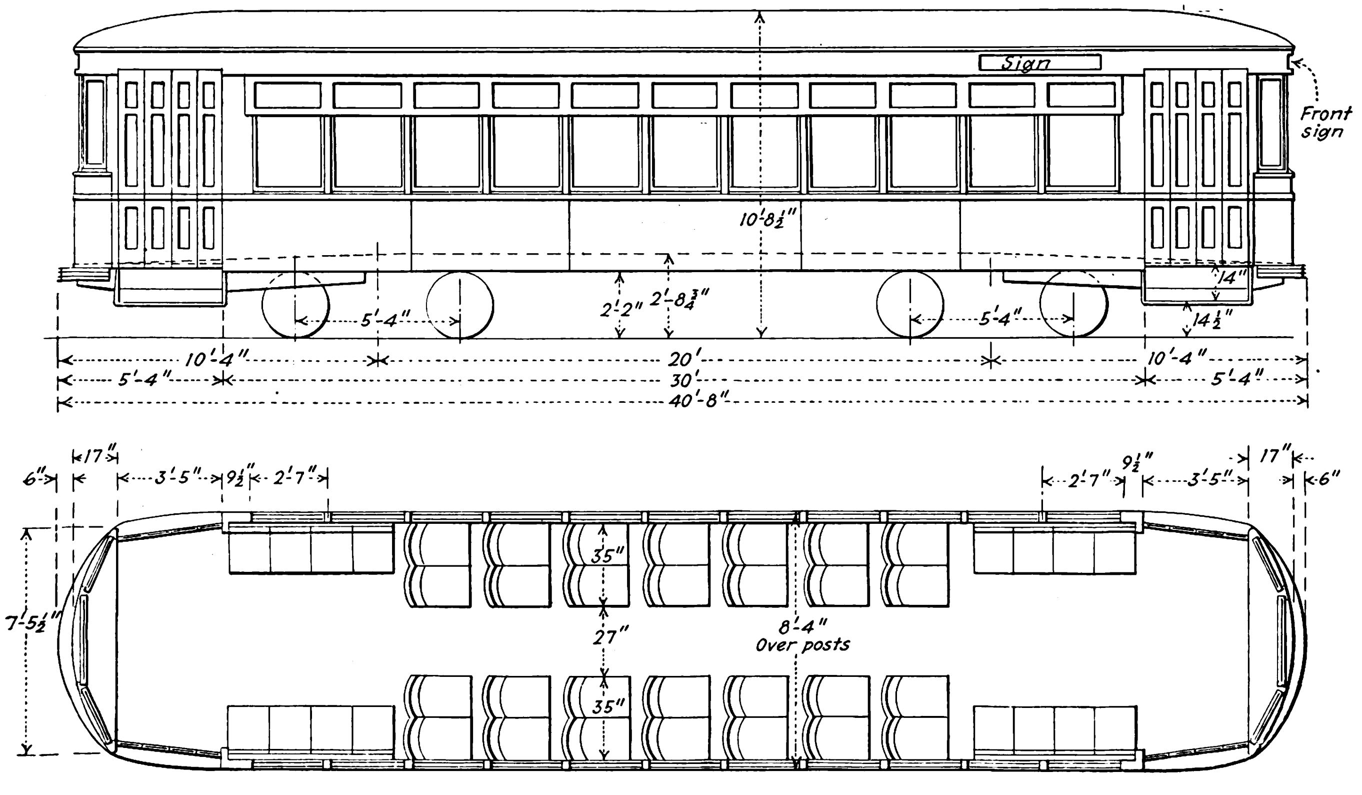
The psychological test to be absolutely effective and practical must begin at the top, said the speaker. It must be good for everybody, and records of each test are essential. In illustrating the point that rapidity of motion and nervous energy often resulted in lost motion, Dr. Gilbreth cited the case of the lazy man who, he said, often makes good by reason of his laziness.

Springfield-Worcester Car Order Placed

Total Cost of 100 New Vehicles Will Be $1,650,000—50 Cars to Be Built by Osgood-Bradley and 50 by Wason —Delivery Promised July 1

PROMISES made by the New York, New Haven & Hartford Railroad to improve the facilities of its street railway subsidiaries in Springfield and Worcester, Mass., culminated on March 22 in the placing of orders for 100 cars costing $1,650,000. As forecast in the JOURNAL of March 14, contracts for 50 cars for the Worcester Consolidated Street Railway were awarded to the Osgood-Bradley Car Company and 50 for the Springfield Street Railway to the Wason Manufacturing Company. They will be of the double-truck, light-weight, one-man, city type, semi-steel construction.

Aside from the accompanying specifications, general specifications issued by the two companies call for four longitudinal seats and fourteen cross-seats of the deep cushion type with welts on the cushions to give individual seat effect. The backs of the cross seats are to be concave and scalloped to give individual seat effect. Panels under longitudinal seats are to be of aluminum. The railway company is to have the option of genuine leather or best quality Chase mohair upholstery. Rico rigid retrieving sanitary car straps are to be provided over each longitudinal seat. The wainscot of



Exterior and floor plan of new Worcester-Springfield cars the car from the top of the seat support panels to the window sills is to be ¼-in. mahogany-faced three-ply Haskelite.

All movable windows are to have Rex brass removable sash. Root, Wason or Bradley air-operated scrapers will be installed at the option of the companies. Specifications with respect to the trucks call for the car body to be mounted on low-level trucks to be selected by the railway company, the trucks to have solid forged side frames and cast-steel bolsters. The proposals of the car companies must contain estimates for both plain and roller bearings. Brakeshoes are specified as A. B. S. & F. Co. Diamond "S," pattern D-67. Safety car devices are to be manufactured by the Safety Car Devices Company. The floor is to be covered with $\frac{3}{16}$-in. battleship linoleum. Automatic window wipers are to be supplied in the center front vestibule window.

Each car is to be equipped with double-faced advertising sign racks to carry public notice cards attached to car lines and extending across the center of the inside car body. An outside color scheme of yellow, cream, and red for lettering, has been specified. All mahogany interior finish is to be stained mahogany. Weights of the cars have not yet been announced.

General specifications are as follows:

Number of cars ordered	50 each
Date order was placed	March 22, 1926
Builder of car body	Osgood-Bradley Car Co., Wason Manufacturing Co.
Type of car	Double truck, city type, light Weight, one-man, two-man
Seating capacity	44
Bolster centers, length	20 ft. 0 in.
Length over all	40 ft. 8 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 10¾ in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	$\frac{3}{16}$-in. Agasote
Roof	Arch
Air brakes	General Electric Co. or Westinghouse Elec. & Mfg. Co.
Axles	A.S.T.M. spec. annealed carbon steel
Bumpers	7-in. Hedley anti-climber
Car signal system	Faraday
Car trimmings	Bronze
Curtain fixtures	Curtain Supply Co.
Curtain material	Brown denim
Designation signs	Hunter
Door mechanism	National Pneumatic Co.
Energy-saving device	Arthur
Fare boxes	Cleveland Model 5
Hand brakes	Peacock staffless
Heater equipment	Railway Utility
Headlights	Golden Glow or General Electric
Motors	Four 35-hp. General Electric or Westinghouse
Paint	Vitralite
Seats	Brill, Heywood-Wakefield or Hale-Kilburn—optional
Step treads	Kass Safety
Trolley catchers	Ohio Brass
Trolley base	Nuttall No. 20 or Ohio Brass
Ventilators	Garland, Railway Utility or Nichols-Lintern
Wheels	A.E.R.A. standard 26 in.

$7,000,000 Additional Insurance Carried by G. E. Employees

More than $132,000,000 in life insurance was carried by employees of the General Electric Company under the free and additional group plans on Dec. 31, 1926. During the first two weeks of 1927 a recanvass of employees resulted in securing 5,000 additional names for a total of about $7,000,000 insurance, increasing the number of all employees of the company insured to 83 per cent of those eligible.

Since the additional insurance has been in force, 340 employees have died. They had free insurance to the amount of $390,825, and 255 held additional insurance totaling $354,500, making a grand total of $745,325.

Approximately 64,000 employees were insured under the free insurance plan, and 46,300 employees under the additional group policy. The average policy under the free insurance was $1,108 and the average under the additional plan was $1,331, making an averoge of $2,439 per employee for the 46,300 in the additional group.

A.E.R.A. Exhibit Blanks Will Be Mailed In May

Fred C. J. Dell, director of exhibits, American Electric Railway Association, is now preparing a new application form for exhibition space for the annual convention of the association at Cleveland, Oct. 3-7. The form will be sent out on May 16 and must be returned within the 30-day limit.

Industrial Exposition in Cleveland

Joseph H. Alexander, president of the Cleveland Railway, Cleveland, Ohio, is the president of the committee in charge of the Cleveland Industrial Exposition, to be held in the Cleveland Auditorium from Aug. 6 to 28. The exposition committee is composed of men prominent in the financial and industrial activities of the Cleveland district.

The purpose of the exposition is to present to the world a concentrated picture of the industrial activity and human progress achieved by northern Ohio; in other words, to "sell" the Cleveland district, its products and its opportunities, to itself and to the world. It is expected that the exposition will inspire not only constructive thought in the community but will open to individual exhibitors new market fields, new accounts and increased consumption of the products displayed.

The exposition will be open from 10:30 a.m. to 10:30 p.m., daily and sunday. Exhibition space is available to products made or sold in the northern Ohio district.

Heads of Electrical Industry Hold Policy Meeting at Briarcliff

Nearly 300 executive officers of the electrical manufacturing industry attended a two-day meeting of the Policies Division of the National Electrical Manufacturers Association, held at Briarcliff, N. Y., March 17 and 18. John H. Trumbull, Governor of Connecticut and president of the Trumbull Electric Manufacturing Company, Plainville, Conn., made the keynote address. Governor Trumbull flew from his home in Connecticut to attend the meeting. An outstanding result of the conference was a definite set-up for the three major divisions of the industry, namely, apparatus, radio and supplies.

Gerard Swope, president of "Nema," was authorized to appoint a committee to study the patent cross-licensing as practiced in the National Automobile Chamber of Commerce, and formulate a plan whereby an interchange of patents in the electrical industry may be achieved. The investigating committee is to report back to the policies division for further action.

In the opinion of those present price cutting has been found to be distinctly uneconomic for both buyer and seller. "We don't like to do business with a merchant who has three prices," said one speaker. "That is one reason for the tremendous growth of department stores. They have one price, based on actual cost and a fair profit, and they stick to it." The consensus of opinion was that a more accurate knowledge of costs will increase sales because it will not result in unintelligent shifting of prices, and it will not cause companies to go into bankruptcy when they should be making money.

The business policies committee reported on such subjects as cash discounts, terms of payment, length of guarantee terms, consigned stocks, freight allowances, service charges, appraisers, charges, and similar items.

Among other speakers were Owen D. Young, chairman of the boards of the General Electric Company and Radio Corporation of America; Clarence L. Collens, vice-president in charge of the Policies Division of "Nema"; H. D. Crouse, president of the Crouse-Hinds Company of Syracuse; A. Penn Denton, president of the Denton Engineering and Construction Company of Kansas City; F. L. Nicholson; H. P. Kirkland; Marle Thorpe, editor of *Nation's Business;* Robert A. Brannigan, manager of the patent department of the National Automobile Chamber of Commerce; L. B. F. Raycroft, vice-president in charge of the association's Radio Division, and others.

Virginia Electric & Power Company Parades New Cars

With various city officials and business and civic club representatives as guests, the Virginia Electric & Power Company, Norfolk, Va., staged a parade for five of its new cars recently ordered from the American Car Company, St. Louis, Mo. The cars will be put in service on the Norfolk and Pinners Point run. This equipment is part of an order for ten cars placed Dec. 1, 1926. Illustrations and full specifications will be carried in a later issue of the JOURNAL.

Diesel Prize Announced for Oil Power Week

Edgar J. Kates, chairman of the national committee in charge of Oil Power Week, has announced that it will be observed this year from April 18 to 23. It is also announced that the national committee will award a cash prize of $100, accompanied by suitable certificates, to be known as the Rudolph Diesel award. This award will be made for the best contribution toward the advancement of oil engines, either in the form of a paper presented at one of the meetings throughout the country under the auspices of Oil Power Week, or a written discussion of a paper, by any one attending any of the meetings. Manuscripts should be in the hands of the national committee not later than June 1, 1927, and the award will be announced by Aug. 1. All persons interested are asked to get in touch with Mr. Kates at the national committee headquarters, 29 West 39th Street, New York City.

Oil Power Week observance will consist of meetings throughout the country for a discussion of subjects of oil-engine fuels, engine design, operation, economics, research problems, etc.

Fifty Cars and Five Buses for St. Louis

Application for authority to build 50 street cars at an estimated cost of $510,000 was filed in the United States District Court on March 21 by Rolla Wells, receiver for the United Railways, St. Louis, Mo. Federal Judge Faris referred the application to Special Master Fred L. Williams for investigation and recommendation. Mr. Wells pointed out that they are needed to take care of traffic requirements.

If permission is granted the company will build the cars in its own shops. The company has built no new cars since July, 1924, and since that time 71 old cars have been retired and scrapped. Mr. Wells informed the court that funds are in reserve sufficient for the construction of the cars.

Application was also filed for permission to purchase five additional buses at a cost of $41,000. This expenditure was also referred to Mr. Williams for approval.

Trends in the Metal Markets

Commencing with this issue of Electric Railway Journal, through the courtesy of and in co-operation with *Engineering and Mining Journal*, there will be published in these columns a weekly review of the non-ferrous metal markets. The prices quoted and the general situation will be as of Wednesday preceding date of issue.

Major non-ferrous metal markets with the exception of zinc have been generally dull during the week ended March 23, according to *Engineering and Mining Journal*. This is the third quiet week for copper, whereas lead has heretofore been moderately active. Zinc buying was close to the average in volume. Zinc, tin, silver and antimony closed the week at prices differing little from those of last Wednesday. Both copper and lead prices are lower; copper is available at 13.25 cents and lead has been cut to 7.55 cents, New York. The sinking of a vessel carrying about 800 flasks of quicksilver has created keen demand in the American market and the price has soared to about $115 per flask.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	March 22, 1927
Copper, electrolytic, cents per lb	13.025
Copper wire, cents per lb	15.25
Lead, cents per lb	7.55
Zinc, cents per lb	7.03
Tin, Straits, cents per lb	68.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.625
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.85
Franklin, Ill., screenings, Chicago, net tons	2.25
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.80
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.76

As regards copper, the large producers during the present week have consistently maintained their asking price of 15.375 cents and some business had been done at that level until March 23. On the other hand, second-hands and custom smelters have been willing to shade this price. As low as 13.275 cents delivered in the East was done, but 13.30 cents represented fairly the low range of the market. A general disposition on the part of consumers, who bought heavily during February, that they can afford to wait is said to be the reason for the present situation of the market. Some of the consumers question the authenticity of the reports of curtailment and say they have been deceived by such rumors before. On the other hand, the attitude of the producers indicates that they have confidence in the belief that demand will exceed the current supply in the next few months and that they do not need to lower their present price to get business. The exporters' price remains unchanged at 13.65 cents c.i.f., though the volume of business has declined sharply during the week.

Lead demand during the last week has been much quieter than usual. With the February rate of world lead production even greater than that of January, producers feel keenly any dull period, and a pronounced tendency to shade prices to effect sales has been in evidence for the last few days. Corroding grades of lead have been somewhat scarcer than chemical lead and have generally commanded about $3 a ton premium in the Middle West. The leading producers in the Middle West have receded from the 7.40 cents, St. Louis, level of a week ago, and on March 23 were at 7.30 cents. Lead at 7.30 cents has been available all week from Friday on, first as resale lots and then from the producers. In the East what little demand there was was satisfied at the American Smelting & Refining Company's price, which continued at 7.65 cents, New York, until March 23, when the price was reduced to 7.55 cents.

Consumers took little interest in tin, either for prompt or future delivery, and dealers were not particularly active. Spot and prompt Straits sold during most of the week slightly above 69 cents, with June about 2¼ cents less. The .99 per cent grade is now only slightly less than a cent below Straits, owing primarily to decreased supply from China.

Zinc prices have fluctuated within narrow limits except for one large sale on Monday, which brought 6.60 cents. There has been some recovery since, although the price is still below that of a week ago. High-grade is quoted at 8½ cents delivered in New York.

M. L. Sindeband Now Vice-President American Brown Boveri

Maurice L. Sindeband has been elected a vice-president of the American Brown Boveri Electric Company. Since 1915 he has been in the engineering department of the American Gas & Electric Company and he was recently elected a vice-president of this company in charge of the electrical engineering department.

Mr. Sindeband was educated at Columbia University. He started his engineering career in 1907 with the New York Central Railroad. His next occupation was station-design work with the Brooklyn Edison Company, and in 1915 he entered the engineering department of the American Gas & Electric Company. His rise here was rapid, and he was made electrical engineer in 1918. The rapid growth of the American Gas & Electric system called for working out large-scale interconnection plans and the building up of a consolidated operating organization. In this executive engineering work Mr. Sindeband was so successful that he was made a vice-president. Several patents attest his ability as an inventor. He has been very active as a writer of articles for the technical press and has presented several papers before the American Institute of Electrical Engineers.

Car and Bus Order at Houston Held in Abeyance

Recent advices are to the effect that the purchase of twenty street cars and ten buses reported in the March 19 issue of the Journal as having been bought by the Houston Electric Company, Houston, Tex., is included as part of a $1,500,000 program of expenditures dependent for its consummation upon a readjustment of the relations between the city of Houston, Tex., and the Houston Electric Company, as reviewed in the Journal for March 12, page 464.

Foreign Trade Convention Set for May 25

The fourteenth national foreign trade convention will be held in Detroit, Mich., on May 25, 26 and 27. A call for the convention, issued by the chairman, James A. Farrell of the United States Steel Corporation, states that the object is "to afford opportunity for thoughtful examination of the present condition and future possibilities of our foreign trade; to stimulate co-operation in the best use of our resources, and to secure the judgment of practical and experienced traders on the problems that confront us."

All Americans concerned in the development of foreign trade as a factor in national prosperity, whether in agriculture, commerce, education, industry, finance or transportation, all chambers of commerce, boards of trade, national and state associations, and other industrial and commercial organizations, as well as firms and individuals, are invited to participate. A full opportunity will be afforded for free discussion from the floor. The secretary of the National Foreign

Trade Council, under the auspices of which the convention will be held, is O. K. Davis, 1 Hanover Square, New York, N. Y., from whom further details may be secured.

Bakelite Caravan Treking Through Central States

Bakelite Corporation, New York City, announces that there is now in progress throughout the Central States a traveling exhibition of Bakelite in industry. The exhibition includes the products of some two hundred manufacturers throughout the United States who have contributed their devices to be used in this demonstration of Bakelite's varied function. From March 10 to March 26 the caravan visted the following cities: Columbus, Dayton, Canton, and Cleveland, Ohio, and from March 28 to May 7 the itinerary will be as follows: Toledo, Ohio; Hotel Commodore Perry, March 30-31; Ann Arbor, Mich., University of Michigan, April 4; Hotel Tuller, Detroit, Mich, April 6, 7 and 8; Lansing, Mich., Hotel Olds, April 11; April 13, Hotel Pantlind, Grand Rapids, Mich.; Hotel Keenan, Fort Wayne, Ind., April 18-19; April 21, Hotel Grand, Anderson, Ind.; April 25-26, Hotel Lincoln, Indianapolis, Ind.; April 28, Purdue University, West Lafayette, Ind.; May 2-3, Hotel Seelbach, Louisville, Ky.; May 6-7, Hotel Sinton, Cincinnati, Ohio.

Rolling Stock

Beaver Valley Traction Company, New Brighton, Pa., will purchase six new passenger cars. They are to be double truck, one-man operated. Delivery is to be made by June. This purchase of cars follows the reseating of ten of twenty recently purchased single-truck cars that were found not to conform to the standard of ease and refinement set by the company for its patrons. The new seats are Kemi-Suede covered and replace those of the wood slat type. The improvement is meeting with public approval.

Pittsburgh Motor Coach Company, Pittsburgh, Pa., a subsidiary of the Pittsburgh Railways, has placed an order for ten type X parlor coaches with the Yellow Truck & Coach Manufacturing Company of Chicago. The new coaches are the 20-passenger type and are similar to those now in service between East Liberty, Point Breeze and the downtown section of Pittsburgh. Delivery will be made at an early date.

Indiana Service Corporation, Fort Wayne, Ind., has announced, through its president, Robert M. Feustel, that ten new city street cars will be purchased this year for operation in Fort Wayne. This is part of a $1,600,000 improvement program outlined for the city. A general plan of $2,000,000 improvement includes rehabilitation of interurban lines running through northern Indiana.

Yellow Truck & Coach Manufacturing Company, Chicago, reports the following bus sales to electric railways: Seven gas-electric buses, Portland Electric Power Company, Portland, Ore.; three type Z city service coaches, Los Angeles Railway Corporation, Los Angeles, Cal.; three 21-passenger city coaches to the Louisiana Electric Company, Lake Charles, La.; four 21-passenger Yellow coaches, Oklahoma Railway, Oklahoma City; three 21-passenger city service coaches, Eastern Texas Electric Company, Beaumont, Tex.

Track and Line

Fresno Traction Company, Fresno, Cal., has been granted a certificate of public convenience and necessity by the Railroad Commission of California to exercise the right and privilege granted by an ordinance of the city of Fresno to extend its lines upon McKenzie Avenue from the intersection of Fresno Avenue, easterly to Ninth Street and McKenzie Avenue and along Fresno Avenue from Fresno and Belmont Avenue to Olive Avenue, or the edge of the city limits of Fresno.

Stark Electric Railroad, Alliance, Ohio, is now laying 300 tons of new rail in and about Alliance and expects to make approximately 7,000 tie renewals during the summer months. According to a statement recently issued by E. W. Sweeney, general manager, the materials for the new work represent an expenditure of $17,000.

Rome Railway & Light Company, Rome, Ga., is planning an expenditure of $75,000 on railway improvements in Rome.

Arkansas Central Power Company, Little Rock, Ark., is planning to lay new rails and paving between its rails on Prospect Avenue from Lee Avenue to St. Mary's Academy. Work will commence as soon as the City Council of Little Rock grants the necessary permission. The improvement, entailing a cost of approximately $150,000, will be one of the major construction jobs of the company's 1927 program. Rail of a heavier section will replace the present 70-lb. rail, and in addition all joints will be welded.

Dallas Railway & Terminal Company, Dallas, Tex., has received approval from the City Commission of Dallas for an additional expenditure of $1,100 on an extension of the Vickery Place street car line. The extension from Vickery Boulevard to Ridgedale Street was included in the extensions to be made under the Everman Plan No. 4. It was completed two months ago, but when its cost was disclosed it was found to have exceeded by $1,100 the estimated cost of $9,770. The additional expenditure authorized by the commission will be credited to the improvement fund of the traction company.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., recently installed eight heavy groundthrow electric switches manufactured by the Cheatham Electric Switching Device Company, Louisville, Ky. Three of the switches have been placed on Washington Avenue, three on Chestnut Avenue, one on Virginia Avenue, and the two remaining switches on Hampton Avenue, and King and Queen Streets.

Trade Notes

Waukesha Motor Company, Waukesha, Wis., furnished the engines for the new Twin Coach designed by Frank R. Fageol of Oakland, Cal., and described in the JOURNAL of Feb. 26.

Robert C. Lanphier has been elected president of the Sangamo Electric Company of Springfield, Ill., to succeed the late Jacob Bunn. He had been vice-president and general manager ten years. Mr. Lanphier is also president of the Sangamo Electric Company of Canada, Ltd., and a director of the British Sangamo Company, Ltd. Otis White, general superintendent, was elected vice-president in charge of manufacturing, and Fred C. Holtz, chief engineer, was elected vice-president in charge of engineering.

Safety Car Devices Company, Wilmerding, Pa., during the past eight months has furnished safety car devices for the following rolling stock orders other than those reported in detail in the ELECTRIC RAILWAY JOURNAL: Five cars, Gary Railway; 50 cars, Pittsburgh Railways; six cars, Roanoke Railway & Electric Company; five cars, Williamsport Passenger Railway; three cars, Alabama Power Company, Birmingham, Ala.

Armco Culvert Manufacturers' Association announces the opening of two new district offices, one in Lincoln, Neb., with Mont C. Noble, formerly chief of bureau of roads and bridges, Nebraska State Department of Public Works, as district engineer in charge, and the other office in East Point, Ga., with Tom M. Neibling, formerly research engineer, Georgia State Highway Department, as district engineer in charge. This office will be in charge of association work in Alabama, Florida, Georgia, Louisiana, Mississippi, Tennessee, North Carolina, and South Carolina, and the Nebraska branch that of the work incident to Nebraska, Kansas, Iowa and Missouri.

The Lincoln Electric Company announces the following changes in its sales personnel: G. N. Bull, formerly with the Worthington Pump & Machinery Company in its Washington, D. C., office, has been made district manager of the New York office; C. S. Freeman, previously in charge of the Lancaster office, has been transferred to the Buffalo office and made district manager; S. W. Shultz, formerly of the Philadelphia office, has been put in charge of the Lancaster office, and E. J. Pfister, formerly of the Buffalo office, has been transferred to the Philadelphia office.

Nichols-Lintern Company, Cleveland, Ohio, is now prepared to furnish the N-L bus heater, which has been under development in practical service and according to the maker has proved its capacity to provide a comfortable heated vehicle and exceptional ventilation.

Bragg-Kliesrath Corporation, Long Island City, N. Y., has recently furnished 100 brakes to the Chicago Motor Coach Company and 37 brakes to the Fifth Avenue Coach Company, New York City.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, April 2, 1927 *Number* 14

An Alligator Meant Motion to the Pharaohs

STRANGE is the concatenation of events. Change is often kaleidoscopic. Even at the risk of seeming to be overzealous the urge is irresistible to call attention again to a week's news that brought forth the stories of the new Springfield car, the new cars for the Washington, Baltimore & Annapolis Railroad, the new car truck for the Chicago & Joliet Electric Railroad and in another field the announcement of a new type of sleeping car containing fourteen rooms with a bed in each.

Surely the world of motion seems to be emerging rapidly from the era of utility to that of luxury, and maybe that is as it should be. No longer does the phrase *magnum vectigal est parsimonia* hold true. It is just the other way around. Economy is no longer a great revenue. Money can be made by spending money. And the transportation industry is finding it out. People want comfort. An alligator is just as good as he was in the days of the Pharaohs for riding upon. That was the affair of the Pharaohs. But the terms good and bad indicate nothing positive considered by themselves. Just because reverence is due to Noah and his ark is no reason why the effort should be made to emulate him today. Yet unconsciously this has been done too often in the case of rolling stock.

The present day Sophists notwithstanding, times do change. Reasoning *à posteriori* from these and other events, the conclusion is inescapable that the railways in their equipment advance are crossing the Rubicon. One must still live before one can philosophize. But in transportation today one must philosophize if one is to live. In the light of recent events it does not seem sacrilegious to chant *te Deum laudamas.*

It Has Penetrated to the Roots of American Life

HE WAS just a little chap, not more than twelve years of age. He was standing in the middle of one of the busiest streets in New York City. He represented the conglomerate type that is an integral part of our city life. On his face was an expression of responsibility far beyond his years. He was directing traffic at a critical time, and traffic was obeying every motion of his hand. There was no confusion. Rattling trucks, screeching taxicabs, clanging street cars, halted at his whistle. In his alert gestures and frail little body was the fruition of one of the greatest movements mankind has ever undertaken. He proclaimed better than all the screaming posters and reams of propaganda that the safety movement has penetrated to the very roots of American life.

Now let us glance Westward. Take the recent case of Albert Frick, the young salesman for the Public Service Company of Northern Illinois, whose life was prolonged for 108 hours through the devotion of more than a score of his co-workers who had been trained in the art of artificial respiration; their skill was made possible because safety had been sold to the company for which they worked. Did Albert Frick die in vain? Certainly not. His death set up another beacon that will dispel the gloomy idea that corporations are soulless; that their employees have no regard for life and limb.

The gasp of the dying man, "Press a little harder, boys," is a motto worthy of the safety movement. If it is obeyed the roots of the movement will not only be sustained, but there will come a time when the unsafe man or woman will be considered a menace to society.

The little boy at the corner, and Albert Frick; what powerful arguments for the doubter!

Further Recognition of Need for Relief from Paving Obligations

RELIEF for electric railways from part, at least, of their paving burdens is a burning issue. So far five states—New Jersey, Connecticut, Massachusetts, Montana and Utah—have extended relief of this kind to the railways. In addition more than 50 municipalities also have granted such relief in whole or in part.

New Jersey is the latest state to recognize the need for relief for its railways from burdens to which they should not be subjected under the changed conditions of the present day. There the Legislature, as noted in the ELECTRIC RAILWAY JOURNAL for March 26, has just passed over Governor Moore's veto a bill to relieve electric railways of a large part of their paving costs by not requiring them to put down new paving around their tracks when municipalities pave. The companies, however, are compelled to repair paving for 18 in. on each side of the track when damage is caused by the operation of cars, but are not compelled to repair damage other than that caused by the cars.

Passage of the bill over the Governor's veto followed a hard fight. Virtually the same bill was passed by both houses last year, but was vetoed by the Governor. When the measure came up again this year some local officials went to the extent of running display ads in the newspapers attacking the bill. However, the bill was carried in both houses by a good margin and was passed up to the Governor. Immediately upon his veto, the bill was reintroduced into both houses and quickly repassed.

The passage of the measure, particularly under these circumstances, should have a salutary effect elsewhere. In New Jersey the issue was coupled with that of the preservation of the 5-cent unit idea on the lines of the Public Service Railway. True, the plea for relief was the plea of the railway in the interest of its patrons, but the public did not have to accept the company's word alone. Rightly, the Board of Public Utility Commissioners as long ago as 1925 aligned itself on the side of the railways. The board then stated that paving obligations have no logical relation to present-day operation as conditions have changed since these obligations were imposed; that they must be considered in fixing the rate of fare, and are a factor in fare increases. The commission went on record to the effect that economies effected by modification of paving obligations more nearly to represent present-day conditions would help not only to maintain the 5-cent unit of fare, but would provide additional revenue toward the better upkeep and maintenance of equipment and in general make available funds for betterment of service and improvement of operating conditions.

These are the conclusions of the state regulatory body. It was a position not taken without due deliberation. Already the passage of the measure has attracted favorable attention elsewhere, notably in New York State, where the cudgels for similar relief have been taken up, notably by the Syracuse *Herald*, which characterizes the relief measure as essentially just. There should be no let-up by electric railways elsewhere in their efforts to secure relief similar to that obtained in New Jersey from conditions that are anachronistic under present-day conditions.

Where One Man Is Better than Two

EVIDENCE continues to accumulate in favor of the one-man car. Not only is it a satisfactory substitute for the two-man car, but service on many properties shows that it is distinctly better than the two-man car. Some of the advantages were referred to briefly in an editorial in this paper for Feb. 19. In a paper read before the recent meeting of the Illinois Electric Railways Association R. F. Palmblade spoke along similar lines from his experience in Peoria and other cities of the Illinois Power & Light Corporation system. He points out that there is a positive decrease in accidents per unit operated when the one-man car is used. Of course, the cars must be equipped with the pneumatic and electric devices that have been developed to forestall man-failure and equipment failure, but these have become so nearly universal in their adoption that one scarcely thinks it necessary to call attention to them any more. In fact, these devices are being used on many of the cars specifically designed for two-man service.

Mr. Palmblade also pointed out once more that the one-man car, properly used, is a time saver. Since the operator does not share responsibility with another, he can proceed with his duties just as soon as he is satisfied in his own mind that he should, without waiting for signals. With the assurance given by the automatic safety devices, many seconds can be taken advantage of which in the aggregate will amount to many minutes in the course of a day. Many of us who have ridden on a street car to save time have listened to the traffic officer's whistle that caused a wait when a fraction of a second saved by the conductor in giving the signal or closing the door would have let the car move through on the previous signal, and have groaned inwardly at the waste of our own time, though we gave not a thought to the company's.

It is well for all those who oppose the introduction or extension of use of the one-man car to ponder well Mr. Palmblade's closing words: "Were it not for the one-man type of operation the public would be paying much more today for a street car ride and many transportation systems would long since have passed out of existence."

Enter the Villain of the Piece

EVEN today on a goodly number of electric railway properties one will find being enacted the typical blood-curdling melodrama of the Roaring Nineties. The hero (Public Relations Department) woos the innocent lass (the General Public) with soft words and gallant gestures. But the wicked villain (Claims Department) grasps the curly locks of our heroine in his vile paw and makes away with her. Ensues a battle royal between hero and villain, with the hero, alas, not always triumphing in the end, according to glorious tradition.

So the standards of the local utility stage must be elevated. Our heroes cannot be allowed to suffer ultimate defeat—it is too unsettling to audience morale. No, the villain in the piece must be given his just deserts, even as he snarls his memorable line "The Public Be Done."

Of what avail the honeyed phrases of the public relations department—its persuasive assurances that its sole desire is to deal in an eminently fair manner with each and every member of the public—when the individuals charged with administering claims settlements are fairly bristling with a "try and get it" air?

The car of a passing motorist is caught between a street car and a coal truck and squeezed into a shapeless and unbeautiful hulk. Possibly the claims investigator will call on the disconsolate owner and assure him that by no stretch of the imagination could the railway company be blamed for the unfortunate occurrence; probably the motorist will be completely ignored. At any rate he is indisposed to let the matter drop and pocket the loss himself, so he writes to the public relations department in the belief that from *this* quarter he will be assured fair consideration. Public relations asks claims about the case and is informed that even though the company may be at fault it would not be "expedient" to arrange a settlement unless the injured motorist actually files a suit. The hands of public relations are tied, so it either writes a letter of meaningless generalities or fails to reply at all.

In high dudgeon the motorist then retains a lawyer and files a suit. Quite as a matter of routine the claims department then waits upon the attorney for the complainant and grudgingly dickers for a settlement. The car owner has won his contention without bloodshed, but must split the amount with his lawyer, so that half of the cost of repairing his automobile probably devolves upon him anyway. When next he reads in the friendly little publication of the transportation company of the great efforts being made to render 100 per cent service and insure cordial relationships with the public, does he believe it? Alas, gentle reader, he does not.

A little public relations psychology injected into the activities of the claims department would make a world of difference on properties where incidents similar to the one just described are all too frequent. Nor does it mean that any claims should be paid unless they are just ones. It is the treatment the claimant receives that counts. A knocker can tear down more good will than ten boosters can build up. On every large city system there is bound to be a considerable number of accidents. Is it good business to develop a first-class knocker out of every individual who comes into unpleasant contact with a reactionary claims department? Let's scrap the villain in the first act and make the local "drammer" a thing of beauty and a joy forever.

Practicing Penance in East St. Louis

LENTEN mortification has been assuaged in East St. Louis, Ill., with the East St. Louis Railway and subsidiaries playing the rôle of moderator. Beginning on Sunday, March 6, and each Sunday until Easter, each city passenger paying a 10-cent cash fare is given a free return trip coupon. On the interurban cars coupons valued at 10 cents are given upon payment of each regular cash fare and can be applied at that value toward the purchase of a return ticket. The reduction is in effect on Sundays only, and in compliance with numerous requests the courtesy has been extended to cover the hours of morning and evening church services.

Although, with the attendant advertising needed and the actual transportation costs, the company will find itself out of pocket an appreciable amount, still even before the advent of mi-carême, the possible revenue loss had been more than compensated for in letters of commendation, newspaper comment, pulpit approval and general good-will publicity.

But granting that many Laodiceans were in need of just such stimulation as a reduced fare or a free return, who would then deny the efficacy of this novel plan? Seemingly unalluring inducements have a telling effect sometimes, although the tale is seldom told.

Aside from the ethics of incentives to attend church exercises and the commentaries on the possible diversion of the money saved through this plan, the railway is to be commended for its co-operation and contribution to the penitential program. It is another instance of the changed status of the utility in sensing the needs of its patrons and in tangibly supplying such wants. In helping its patrons "to carry on" in Lent, perhaps the railway is doing a service more far reaching than it contemplated!

The Safety Car Duckling Growing Into a Swan

IN THESE days, when a posy thrown in any direction is pretty sure to hit a de luxe trolley car, let us not forget that in many cases this pleasing development was made possible by that ugly duckling the automatized, light-weight safety car.

Born of the dire need for economy, the safety car with its exposed carlines and slat seats could not make claim to that comfort and beauty which create patronage by stimulating the desire to ride an attractive vehicle. Its first job was to cut down costs; its second to hold or recapture business through greater frequency. Those jobs were done so well that hundreds of properties were able to keep their heads above water through all the awful struggles of post-war price increases and personal car expansion.

Now that this phase of the industry is past, electric railway operators are finding that the time is opportune to take the further step of producing transportation of a quality that has something more than mere utility. People use their personal cars not because they have to but because they like to. The present effort is to secure the same viewpoint for the public conveyance. Of course, that can never be 100 per cent possible, but when we consider the increase in the habit of riding brought about by the automobile and the great difference in cost between private and public transport there is plenty of business in sight for cars designed to attract it.

In view of the varieties of de luxe cars coming forward, it is pleasant to observe that the Stone & Webster organization, which did so much pioneering with safety cars, has encouraged its operators and its car specialist, C. O. Birney, to adapt themselves to the needs of the new ride-selling era. The Birney safety cars on various Stone & Webster properties today, with their cushioned seats, treadle doors, rich illumination, bright interior trim and exterior treatment in combinations like red, white and gold, afford a striking and happy contrast to their barebone predecessor of the war and post-war periods. The duckling hatched under grim necessity shows promise of becoming a beautiful swan.

Manufacturers of Tools Are Missing a Great Opportunity

NOW that the time has rolled around for securing exhibition space at the annual convention of the American Electric Railway Association at Cleveland next October, one is tempted to review the list of exhibitors at last year's convention, having in mind the very few tool manufacturers who have availed themselves of this medium of acquainting the industry with the value of their products with respect to servicing buses.

With the ever-increasing sale of buses as an auxiliary transportation for railway utilities, the need for proper servicing grows daily. Investigation reveals that in instances too numerous to mention the railway companies operating bus lines are at a loss to make emergency or general repairs due to lack of the proper tools. That these tools are being manufactured for every class of bus goes without saying. On the other hand, very few bus operating companies know that the right tool for the right job is available, which brings up the all-important subject of proper exhibits at a convention which attracts practically the entire personnel of the industry.

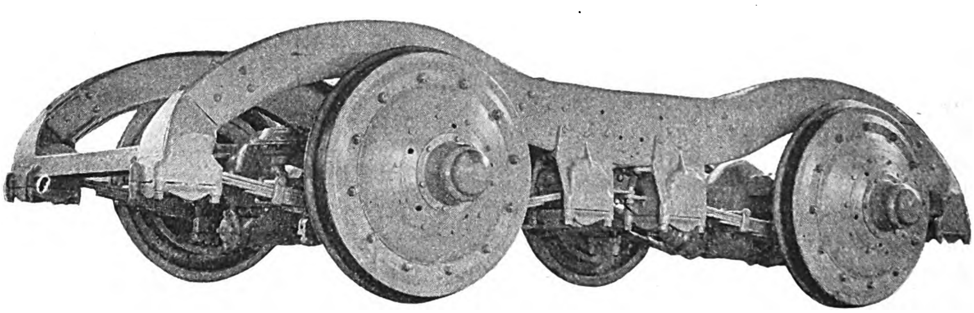
It appears to the JOURNAL that an exhibit of these tools is highly important and will be of mutual benefit to the railway companies and the manufacturers. It is one thing to have a fine stock of tools adapted for all purposes of repair and quite another thing for them to repose unexploited upon the shelves of the manufacturer. A golden opportunity is being missed in this respect, and in a spirit of absolute disinterestedness the JOURNAL suggests that tool manufacturers join the big parade in order that every one concerned may profit by physical inspection of their wares.

As illustrative of the value of showing a tool for every purpose and every job, one prominent member of the American Electric Railway Association was high in his praise of the Annual Maintenance and Construction Issue of the JOURNAL, basing his remarks upon the improved equipment section, which illustrated a wealth of tools and devices of inestimable value to the industry. This gentleman expressed the opinion that a section of this kind not only would give the master mechanic a splendid idea of the tool, and create a desire to possess one in his shop, but it would benefit the manufacturer in one of his greatest problems, i.e., making the purchaser visualize the usefulness of the tool.

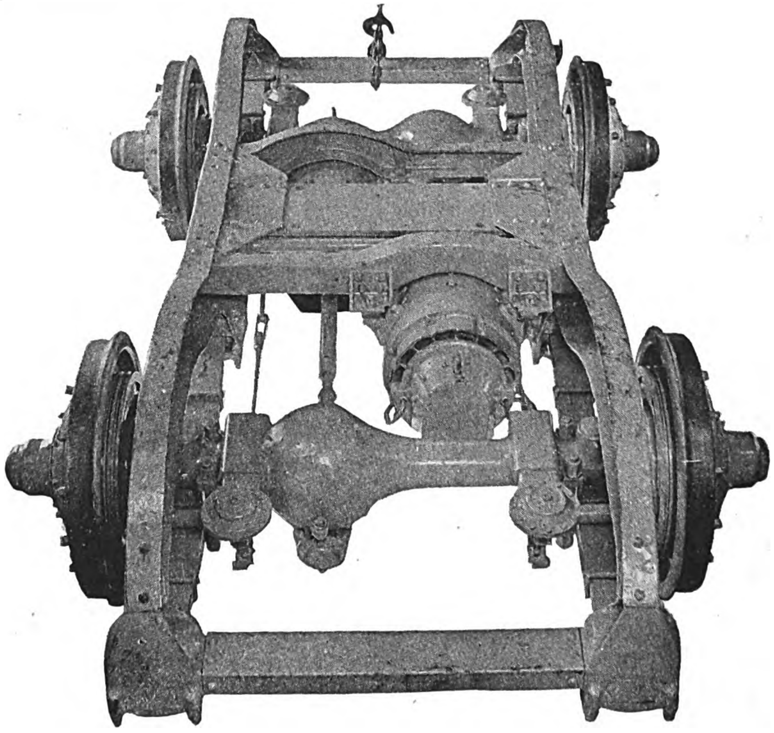
Joliet Develops

Worm-Drive Trucks to Reduce Unsprung Weight

Complete departure from conventional design is expected to reduce noise, cause less wear and tear on the car and track, and increase riding comfort



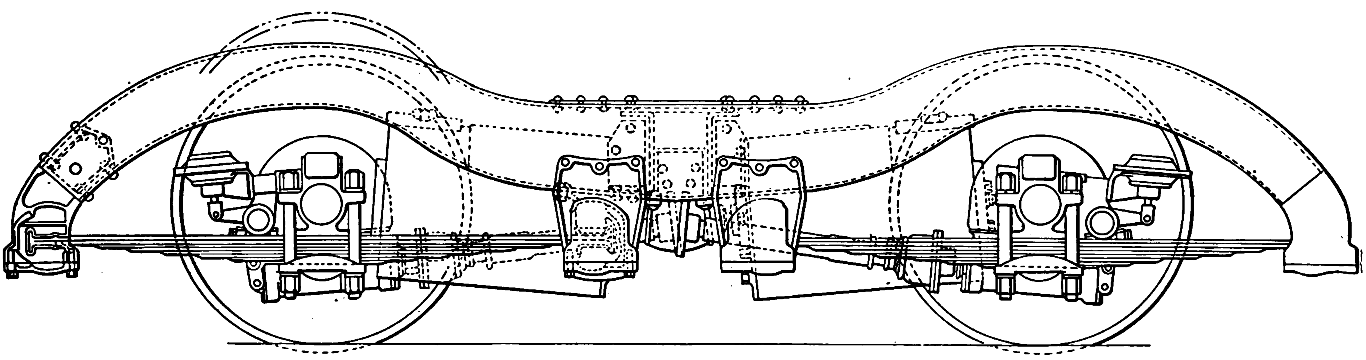
Reduction of unsprung weight, elimination of noise, smaller weight and operating economy were the objectives in the Joliet truck design. Although still considered in the light of an experiment, this departure from customary railway practice is based on the application of design features which have proved successful in heavy-duty automotive vehicles



A very simple type of construction is obtained in this application of automotive axle construction to a street railway truck. The side frames are made of $\frac{5}{16}$-in. pressed steel. The bolster is likewise pressed steel, $\frac{3}{8}$ in. thick

FURTHER radical departures from conventional design are incorporated in a pair of sample worm-drive street car trucks completed for the Chicago & Joliet Electric Railway by the Timken Detroit Axle Company. This development is the outgrowth of a conviction in the mind of J. R. Blackhall, vice-president and general manager of the Joliet property, that an entirely new standard of street car performance is needed to meet the demands of present-day conditions. As in the case of the experimental trucks for Springfield, Mass., an account of which was published in last week's issue of ELECTRIC RAILWAY JOURNAL, reduction of noise was one of the principal objectives sought. This seemed to dictate a design which would provide driving gears fully inclosed, protected from dust and immersed in oil. It also seemed clear that unsprung weight must be reduced to a minimum by carrying the driving motors on spring-suspended members of the truck framing rather than directly on the car axles. This is expected to reduce wear and tear on both equipment and track, while at the same time reducing those noises attributable to the pounding of the conventional construction over joints and special work. A gear reduction of $8\frac{1}{2}$ to 1 is used. The effect of the large gear reduction made possible by worm drive is cumulative in the design, since it permits the use of comparatively light, high-speed motors giving necessary driving power with a large saving in weight. One truck completely equipped with two Westinghouse V-91-B motors having a one-hour rating of 35 hp. and with brake apparatus weighs only 5,328 lb. This weight reduction, together with the probable increased efficiency for frequent stop service resulting from the high gear ratio, is expected to show a considerable economy in power consumption.

Several railway and automotive manufacturers col-

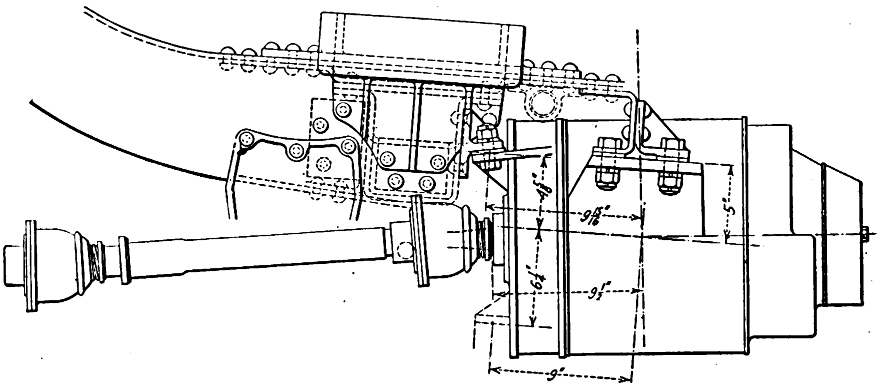


Half-elliptic springs on the Joliet worm-drive truck are carried in Masury rubber shock absorbers mounted in cast steel housings on the truck frame. A fixed pressed steel bolster is used

laborated with Mr. Blackhall and the Timken Detroit Axle Company in the truck design and construction. These include the Westinghouse Electric & Manufacturing Company, the Westinghouse Air Brake Company, and A. F. Masury and C. Froesch of the International Motors Company, who co-operated in the spring mounting design. Special section rolled-steel wheels were furnished by the Standard Steel Works. The pressed-steel side frames and all other pressed-steel parts were made by the Inland Steel Products Company. Although the trucks for Springfield, Mass., and the Joliet design are similar in many respects, they differ in several important features. A fixed bolster is used in the Joliet truck, the frame is of different design and the gear reduction is 8½ to 1 instead of 10 to 1 used by Springfield.

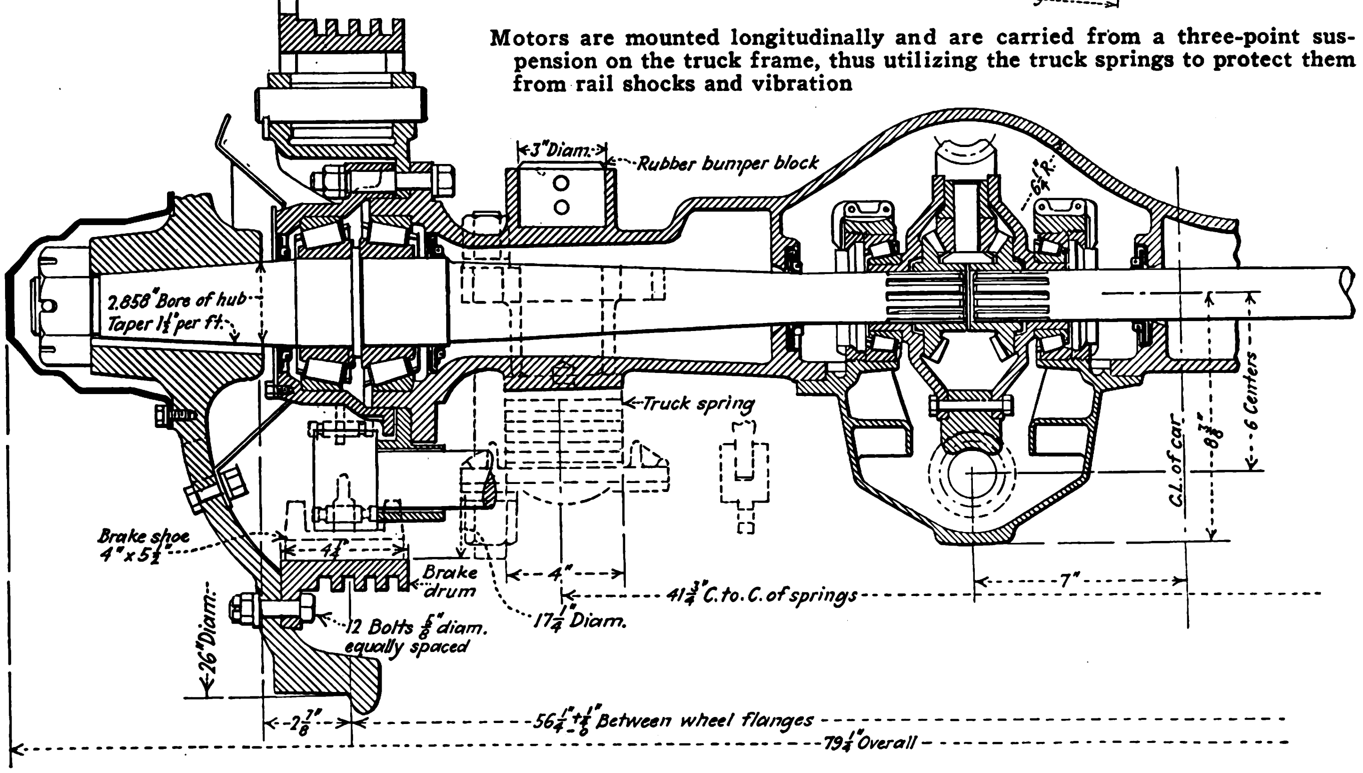
A specially designed body of combination wood and Duralumin is being built by the Cummings Car & Coach Company. This will be 45 ft. 1 in. long over all, 8 ft. 6 in. wide and 11 ft. ½ in. extreme height. The body will be arranged for one-man, two-man, double-end operation with automatic rear exit doors and will seat 51 passengers. It is estimated to weigh 14,000 lb. with all equipment. This will make the weight of the car complete with double trucks and four motors approximately 24,600 lb.

The worm-drive axle is not new in principle but is an adaptation of construction features which have been successfully used on heavy-duty automotive vehicles. It is of the underslung worm, fixed-hub type. The housing



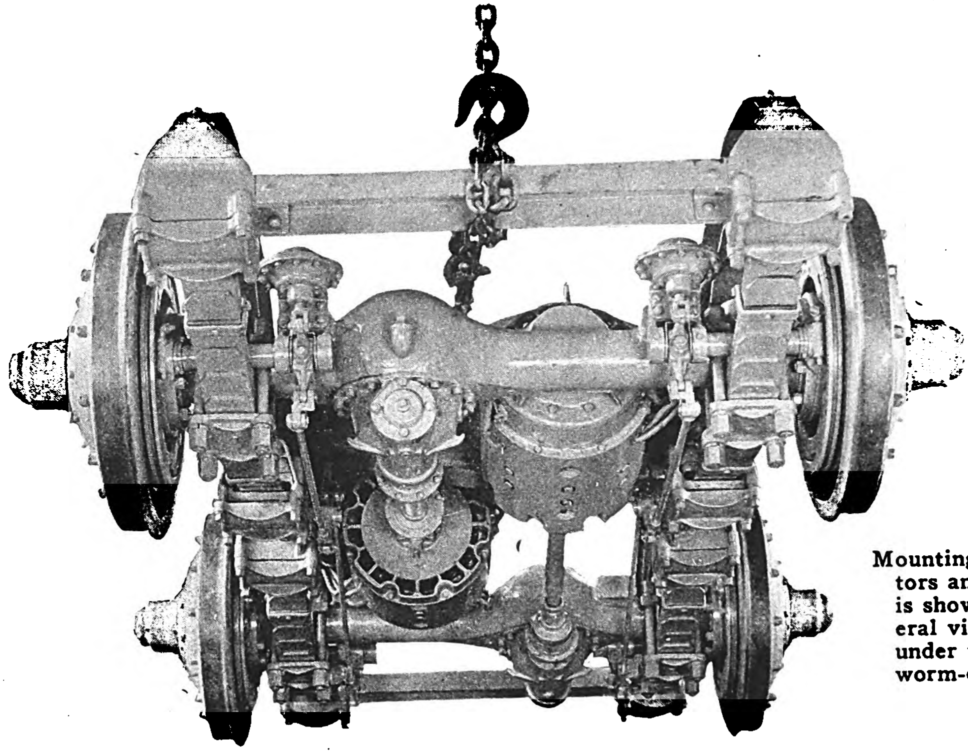
4⅝"
9½"
5"
6¼"
9½"
9"

Motors are mounted longitudinally and are carried from a three-point suspension on the truck frame, thus utilizing the truck springs to protect them from rail shocks and vibration



3" Diam.
Rubber bumper block
6¼" R.
2.858" Bore of hub
Taper 1½" per ft.
Truck spring
C.L. of car
8⅜"
6 Centers
Brake shoe 4"x5½"
4½"
Brake drum
4"
41¾" C. to C. of springs
7"
12 Bolts ⅝" diam. equally spaced
17¼" Diam.
26" Diam.
2⅞"
56¼"±⅛" Between wheel flanges
79¼" Overall

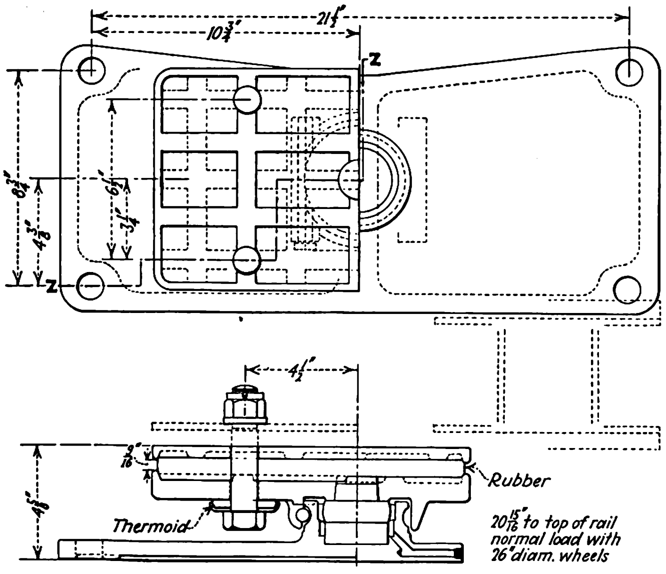
Cross-section through the Timken worm-drive car axle shows the special dished wheel section which reduces the overhang at the wheel bearing. The underslung worm has a clearance of 4 in. to the rail



Mounting of the motors and drive shafts is shown in this general view looking up under the new Joliet worm-drive truck

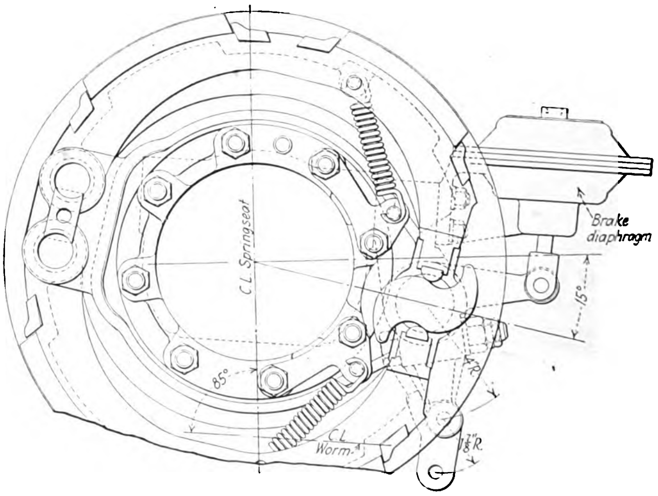
is a one-piece steel casting with the worm carrier bowl offset from the center so as to permit the motors to be offset in the truck, driving in each case the far axle by a short driveshaft connected through two Spicer universal joints. Spring seats for the 4-in. wide half-elliptic truck springs are cast integral with the axle housing. The axle shafts are made of heat-treated alloy steel, designed with a large margin of safety for the calculated loads. Compared with the conventional automotive shaft the spline end is quite small in proportion to the load end. This is for the reason that the maximum torque that can be exerted is considerably less than in automotive practice because of the relatively small coefficient of friction between steel wheels on rails in comparison with that obtained on a rubber-tired vehicle.

Customary factors of safety have been considerably increased in the sample truck. A 3-in. axle diameter is used in place of 2⅝-in., which has proved satisfactory in heavy-duty vehicle practice under the same loading. By the use of dished steel wheels a still further improvement is made over automotive practice. With the conventional fixed-hub automotive axle it is customary to have a considerably overhung load on the wheel bearings because the small inside diameter of the rubber tire does not permit dishing the wheel to bring the center line of the tire in line with the wheel bearing. In the Joliet car axle the dished wheels materially reduce the overhung load and the only serious bending stresses expected are those due to thrust on curves.



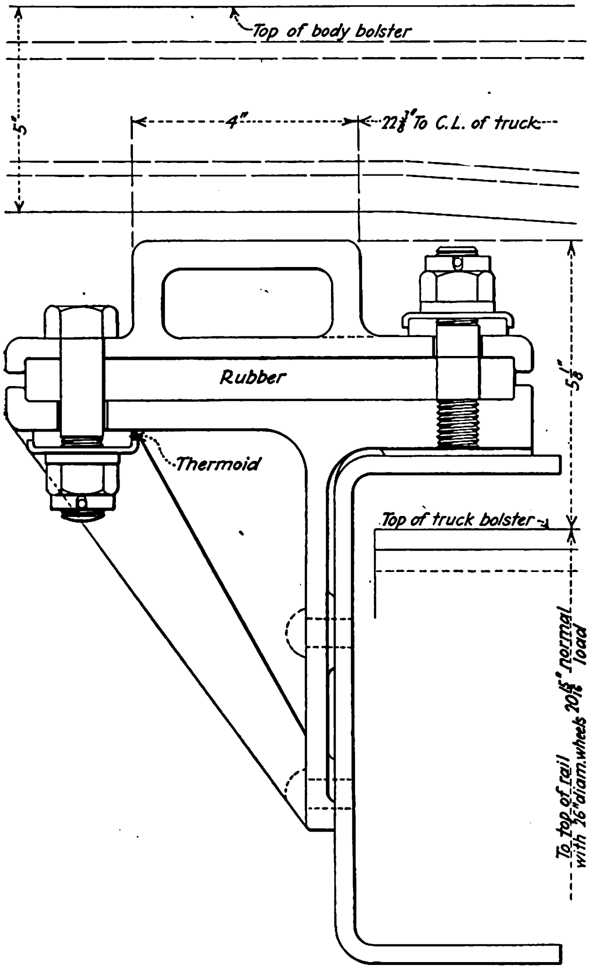
Section Z-Z

A rubber pad to absorb vibration and noise is used at the center bearing



Westinghouse automotive type brake diaphragms are mounted on the axles adjacent to each wheel. The brake drums are bolted inside the special wheels and have a diameter of 17¼ in. The effective braking surface is almost four times that obtained in automotive vehicles

The wheels have a taper fit on the axles and are held in place by a nut on the end, covered in turn by a protecting cap. Clearance under the worm housing is 4 in. to the rail. Westinghouse automotive type brake diaphragms are carried directly on the axle housings and are connected through the brake mechanism to the internal expanding shoes at each wheel. The brake drums are 17¼-in. diameter with 4-in. face. They are bolted to the inside of the wheels and have fins turned on their outside surface to improve heat radiation. There is 7/16 in. of effective wearing metal to insure long life before renewal is necessary. Two brake blocks are used on each shoe, having an area 4 in. x 5½ in. Almost four times the braking surface ordinarily provided on buses is thus obtained. Comparisons of weight per unit of brake block surface on present cars and buses with that on the experimental trucks gives an expectancy of between 75,000 and 100,000 miles per set of blocks.



Rubber pads are used under the side bearings to deaden sound

Side frames of the truck are made of 5/16-in. pressed steel in channel form, proportioned to carry the loads and give necessary stiffness. The fixed bolster is made of ⅜-in. steel, pressed into the form of a deep pan, with a cover plate of the same material riveted in place. It is attached to the side frames by gusset plates. Rubber pads of special design are to be used between the bolster and the center bearing to reduce noise and vibration and to improve riding.

Four-inch semi-elliptic springs of automotive type are securely clamped by bolts under the spring saddles provided on the axle housings. At their ends these springs are carried in Masury rubber shock insulators mounted in special cast-steel housings on the truck side frame, as shown in accompanying illustrations.

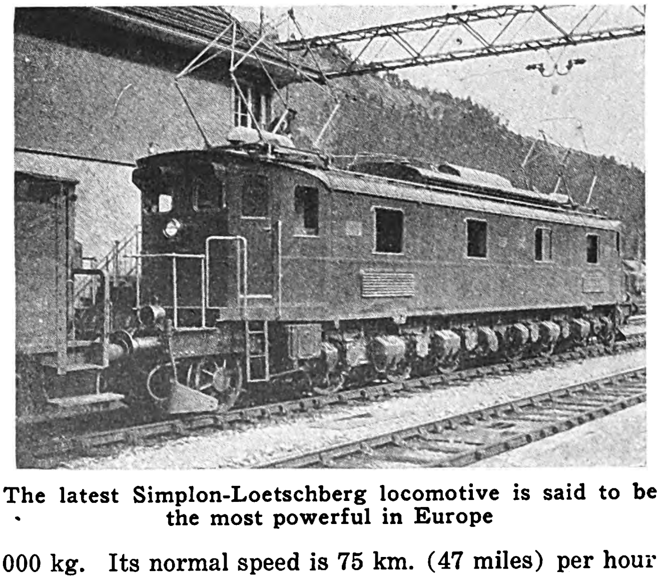
The motors are securely carried on three-point suspensions in the truck frame, so that they are fully protected from vibration and shock through the truck springs. They are wound for 300 volts and are permanently connected in series in pairs of two, for operation on 600 volts. Series parallel control is obtained by treating each pair of two motors like a single motor on an ordinary two-motor control car. The mounting is so arranged that the motor may be readily dropped out of the truck for quick replacement or repair.

Use of automotive type air brakes permits a very simple and workmanlike brake rigging construction which is expected to eliminate much of the rattle attributable to the customary type of street car foundation brake rigging. Adjustment for wear on brake blocks can be conveniently made through an adjustment nut on the brake application shaft. The equipment is arranged so that a hand brake can be conveniently attached. It will be arranged so as to apply the brakes to only one truck from each end of the car. This is considered ample to hold the car on a grade.

Although the new trucks are such a wide departure from customary practice as to make many features of the design experimental in nature, experience with this type of construction in automotive practice indicates a reasonable expectancy of low maintenance and long life. It is claimed that 500,000 miles of life is not uncommon for this type of axle in heavy-duty automotive practice, and that 1,000,000 miles should be obtained under the reduced loads and shocks encountered on street cars. On the basis of an average annual mileage of 40,000 this would give a 25-year life.

Largest Electric Locomotive in Europe

CLAIMED to be the most powerful in Europe is an electric locomotive of the Berne-Lötschberg-Simplon Electric Railway which began service July 22, 1926. There are six driving axles, each driven by two Westinghouse twin motors with quill mounting. Each twin-motor group has a one-hour capacity of 700 hp., making the total capacity of the locomotive on this rating 4,200 hp. The one-hour tractive effort of the locomotive is 22,600 kg. and its starting tractive effort is 34,000 kg. Its normal speed is 75 km. (47 miles) per hour and it is capable of hauling a trailing load of 586 metric tons up a grade of 2.7 per cent at a speed of 50 km. (31 miles) per hour. The weight of the locomotive is 135.5 metric tons, of which 68.5 tons represents the electrical part and 67 tons the mechanical part. The length of locomotive over all is 20.2 meters or 64 ft. 4 in. The drivers have a diameter of 53¼ in.



The latest Simplon-Loetschberg locomotive is said to be the most powerful in Europe

Energy is taken from the overhead system at 15,000 volts, 16⅔ cycles.

Electric Locomotives Stand Up Well in Service

After Nineteen Years Operation St. Clair Tunnel Equipment Is Available for Service 97.7 Per Cent of the Time, with Low Maintenance Costs

NINETEEN years ago the St. Clair tunnel of the Grand Trunk Railway, now the Canadian National Railways, between Sarnia, Ontario, and Port Huron, Mich., was electrified with the single-phase alternating-current system at 3,300 volts. Speaking before the heavy electric transportation class of the Westinghouse Club, Walter D. Hall, superintendent of the tunnel, gave an interesting account of the service that has been performed by the equipment in that time, a portion of which is given in the following abstract.

The electric service was inaugurated in 1908, with six 67½-ton Westinghouse Baldwin electric locomotives. In 1908 these locomotives made 154,392 miles, hauled 288,516 cars weighing 9,231,500 tons. Last year, 1926, these same locomotives made 248,025 miles, hauled 468,760 cars weighing 19,696,708 tons.

In the nineteen years since these locomotives were first operated they have hauled 6,617,590 cars, 268,917,150 tons and made about 3,934,010 miles, an average of 655,660 miles per locomotive; during all these years there is not a total of one hour's delay charged to locomotive failures, and in their nineteenth year, 1926, they were available for service 97.7 per cent of the time; time not available being made up as follows:

	Per Cent
Changing wheels, mostly due to soft tires	0.57
Electrical, changing armatures, etc.	0.57
Mechanical, equalizers, brake rigging, pinions, etc.	0.33
Hydrostatic and hammer tests and other tests for government reports	0.63
Derailment damage	0.20
Total	2.30

The average cost of maintenance per locomotive-mile over the entire period was 9.45 cents. Last year, 1926, this cost was 6.21 cents per locomotive-mile, cost per car-mile 0.659 cent, and cost per ton-mile 0.015 cent.

The locomotive auto-transformers have been rewound once and the commutators of the traction motors were renewed once. The fields of all motors have given practically no trouble. Five air compressor armatures have been repaired, but there has been practically no trouble with the blower motor armatures. Controllers and wiring have required only proper inspection and care. Three or four preventive coils have failed and practically all the union joints in copper rods from these gave trouble at some time, apparently due to the piece of fine copper gauze used in them; the gauze perishes and leaves a loose joint.

The pinions and gears have done remarkably well. Some pinions have exceeded 200,000 miles when removed. Some of the original gears are still in service, having made about 655,000 miles.

The frames of these locomotives are rigid from end to end and on account of the many curves encountered in the terminal yards wheel mileage has been low; on account of sharp flanges experiments were made with oil and hard grease applied in various forms, but without success.

At that time, 1910, the yard engine tires were making about 42,000 miles between turnings, and a maximum of about 250,000 miles, which meant a lot of time lost over the pit as well as a big expense. Realizing the seriousness of the situation, Mr. Hall and one of his foremen rigged up an old lubricator body with spray nozzles, similar in principle to an atomizer, so that the engineers could spray oil onto the wheel flanges when approaching curves by pressing a contact button at any of the controllers. This was so satisfactory that some of these tires made more than 150,000 miles between turnings and a total of more than 300,000 miles. The bearings of these locomotives have given practically no trouble.

IMPROVEMENTS MADE IN OVERHEAD LINES

Strain insulators began to blow up during wet weather and it was found that due to a slight movement having taken place in the insulator, or perhaps due to expansion, the ends had cracked and soot and acid from steam locomotive gases were washed into these cracks during rain storms; this difficulty was overcome temporarily by making shields of sheet fiber which were wrapped around the insulators, allowing the shield to extend beyond the ends about 8 in.

As opportunity presented other insulators were installed, but even with these some difficulty was experienced when hauling heavy ore trains beneath them with steam locomotives; the exhaust gases and moisture would short circuit insulators and result in a ground to the bridge structure; this trouble was overcome by placing two insulators in series a sufficient distance apart to prevent gases emitted from the locomotive stacks striking both at the same time.

In the tunnel were 480 insulating devices which supported two trolley wires from parallel messenger cables. The insulating medium was about 6 in. of impregnated wood. The two messenger cables were supported on barrel-type porcelain insulators. Apparently due to unequal expansion and contraction, the barrel type insulator would sometimes crack, and during damp weather the 480 wood insulators allowed sufficient leakage to blow up the line. An average of eleven short circuits per year resulted from this cause and some danger was present at all hours during the night or day. The wood insulating devices were assembled with hexagon-headed bolts and hexagon nuts and were very difficult to get at even with a box wrench.

To overcome this difficulty 480 insulating supports were made of ½-in. x 1-in. strap and standard 10,000-volt pin-type insulators. This was in 1915, and since that time there has not been a single failure, although the barrel-type insulators continue to crack, and sometimes sections even break away and fall to the floor of the tunnel. In this device bolts square under head and square nuts are used so that they can be easily and quickly removed from the line.

Emergency Service at Montreal Completely Motorized

ALL horses of Montreal Tramways, Montreal, Que., used in the past for construction activity and assisting in maintenance of overhead lines, have been sold. Motors have taken their place. The company's stables on Cote Street are now in process of demolition. Car storage tracks will replace the building. Thirty horses comprised the company's equine fleet, grandsons and great-grandsons of the source of power for the old-time horse cars in Montreal. They were all in good shape and brought good prices when they were sold.

Buses and Cars Give Co-ordinated Local and Express Service

By George H. Harris

General Manager Key System Transit Company, Oakland, Cal.

Key System Transit Company has reduced running time between Oakland and Berkeley by five minutes. The fare is the same for both types of service, with free transfer

Express car and local bus in the co-ordinated service recently established by Key System Transit Company

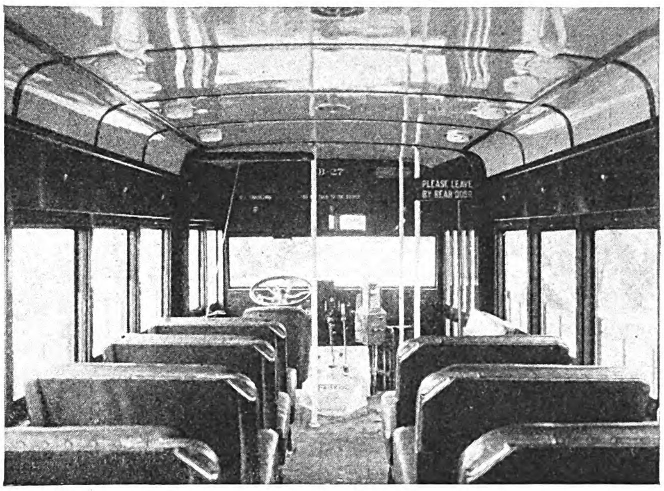
USE of buses in conjunction with street cars, not as feeders, but along the same route, providing local service and leaving the tracks for express service by cars, is being tried by the Key System Transit Company, Oakland, Cal. This railway serves a metropolitan area populated by some half million persons. Consequently on a number of long car routes rapid transit is desirable. Most important of these are the routes between Oakland and Berkeley, which are separate municipalities, but in reality form one large community.

Three car lines operate between the downtown districts of the two cities, via College Avenue, via Telegraph Avenue and via Shattuck Avenue, the two latter running on Telegraph Avenue to a point some 40 blocks from down-town Oakland where Shattuck Avenue branches to the left and, later swinging to the right, becomes Berkeley's principal business street. The Telegraph Avenue line, which is a little longer between the two business centers than is the Shattuck Avenue line, was chosen for the experiment because it is a direct run between the campus of the University of California and the rapidly growing business district on the Oakland side of the campus. From a point a block distant from the campus it veers to the left to rejoin the Shattuck Avenue line in the heart of the Berkeley business area. Traffic on this route is exceptionally heavy.

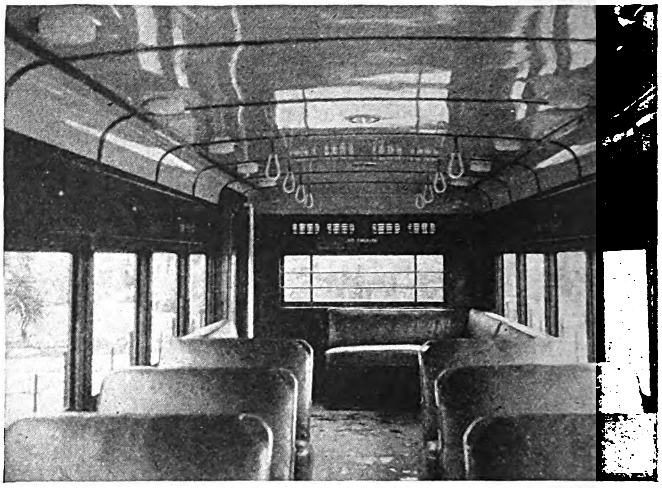
FEWER STOPS RECOMMENDED

Steps which led to the plan now in operation are interesting. Two years ago, in the interest of better service to the public, a survey of the traffic situation was made by a committee of three composed of representatives of the California State Railroad Commission, the city of Oakland, and the railway. This committee recommended the establishment of feeder bus lines in various parts of the city, reducing the number of car stops from 13 or 14 per mile to eight and consideration of some form of express service to outlying districts.

After the two first recommendations had been carried out attention was directed to a study of the third. Express bus service between Oakland and Berkeley was first considered and an application was filed for per-



Passengers enter at front and deposit fare in Johnson box



At the rear a sizable well is provided to accommodate passengers leaving by the automatic rear door

mission to put it in operation on a 10-cent fare with the approval of the two cities concerned. Further study indicated that 10 cents per passenger would be insufficient, so the application was withdrawn and revised to call for a 15-cent fare. Meeting with the disapproval of the cities, this, too, was withdrawn. As a result of further consideration the system now in use was developed.

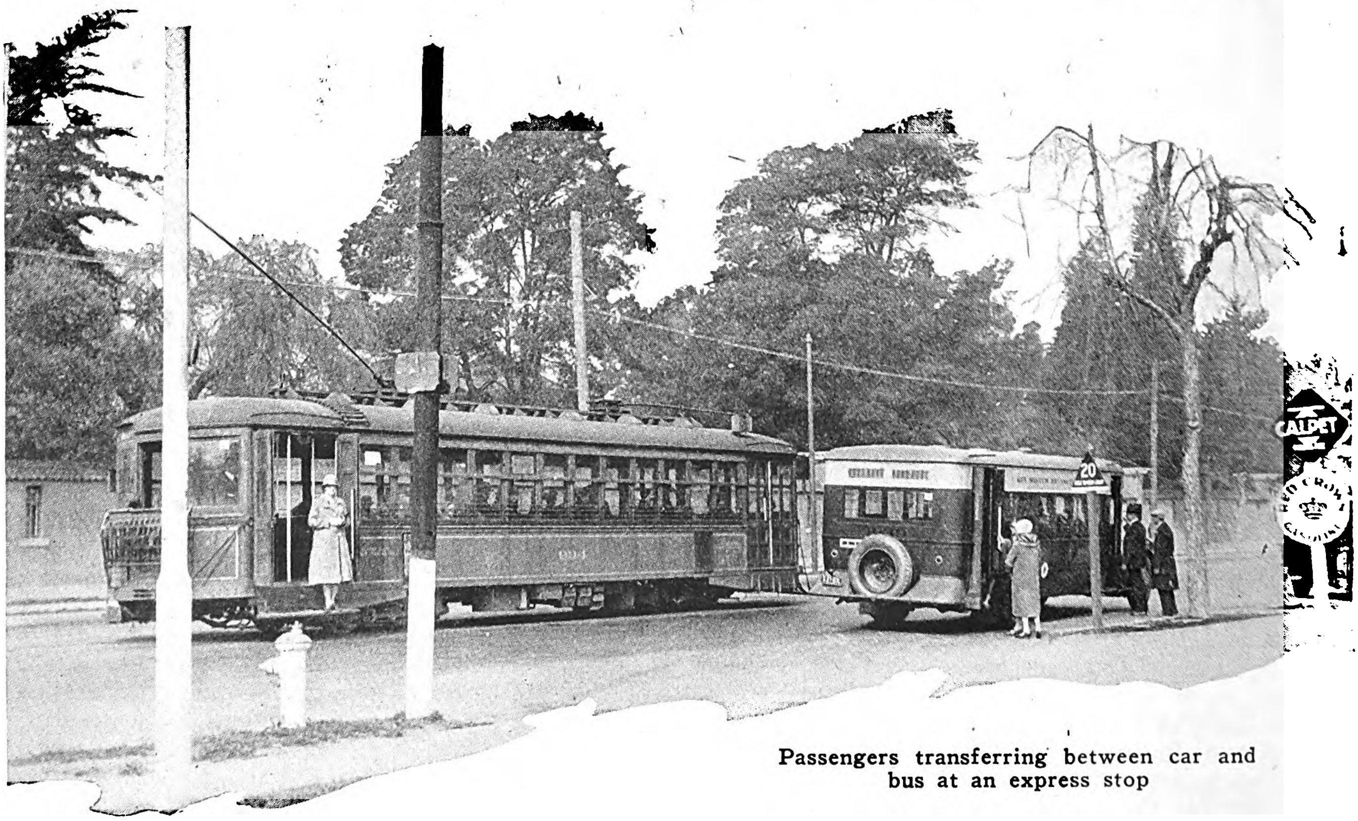
Buses are operated on a local schedule out Telegraph Avenue as far as Alcatraz Avenue, which is about two-thirds of the distance between the two business districts and is the approximate boundary line of the two municipalities. Telegraph Avenue cars operate on an express schedule of three stops to the mile as far as Alcatraz Avenue and then resume local operation. Shattuck Avenue cars run on the same schedule as far as Shattuck Avenue on Telegraph and there resume local operation.

The fare for both buses and street cars is the same as in other sections of the cities—7 cents—and passengers boarding buses outside of the downtown areas, where the cars make regular stops, may transfer to cars at any express stop. Oakland-bound passengers on express cars may leave at any stop along the route provided they have boarded the cars outside the express limits.

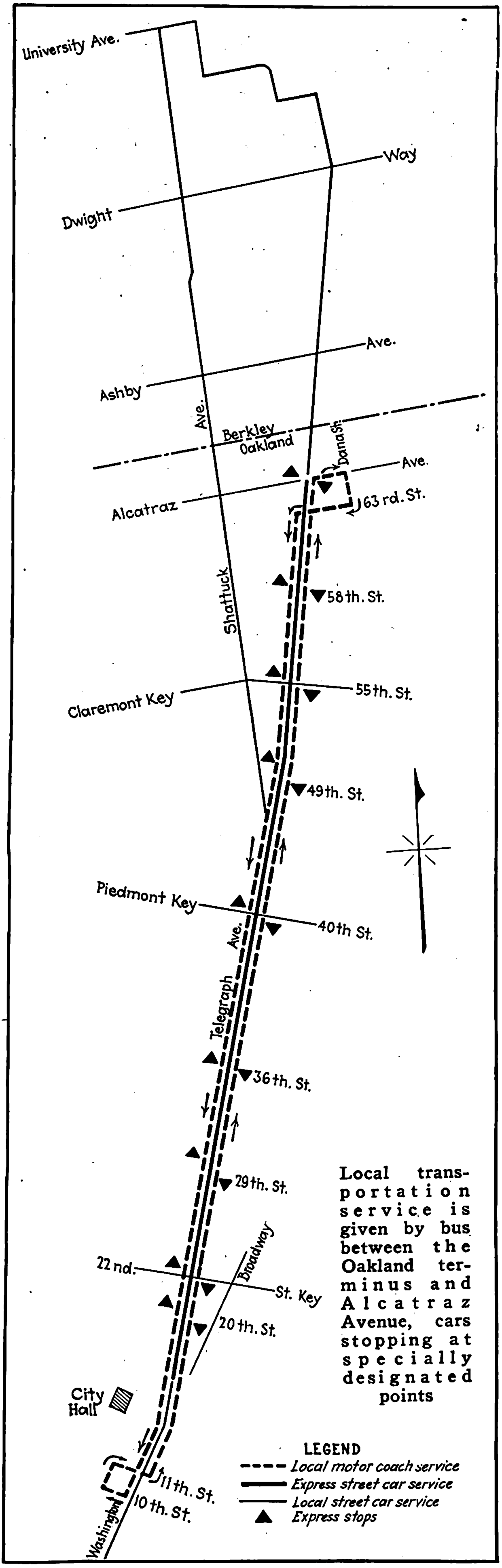
The present express service on the Shattuck and Telegraph Avenue lines, respectively 5 and 6 miles long, saves from three to five minutes per trip between the business districts. Cars are operated on a ten-minute schedule and the buses every four, six, or 7½ minutes, depending on traffic conditions.

BUSES HAVE AUTOMATIC REAR EXIT

For this service fourteen Fageol 29-passenger buses are used. The bodies are all steel and were designed by the railway's engineers. They are the front-



Passengers transferring between car and bus at an express stop


University Ave.
Way
Dwight
Ave.
Ashby
Ave.
Berkley
Oakland
Dana St.
Ave.
Alcatraz
63 rd. St.
Shattuck
58th. St.
Claremont Key
55th. St.
49th. St.
Piedmont Key
40th St.
Telegraph
Ave.
36th. St.
29th. St.
Broadway
22nd.
St. Key
20th. St.
City Hall
11th. St.
10th. St.
Washington
LEGEND
Local motor coach service
Express street car service
Local street car service
▲ Express stops

Local transportation service is given by bus between the Oakland terminus and Alcatraz Avenue, cars stopping at specially designated points

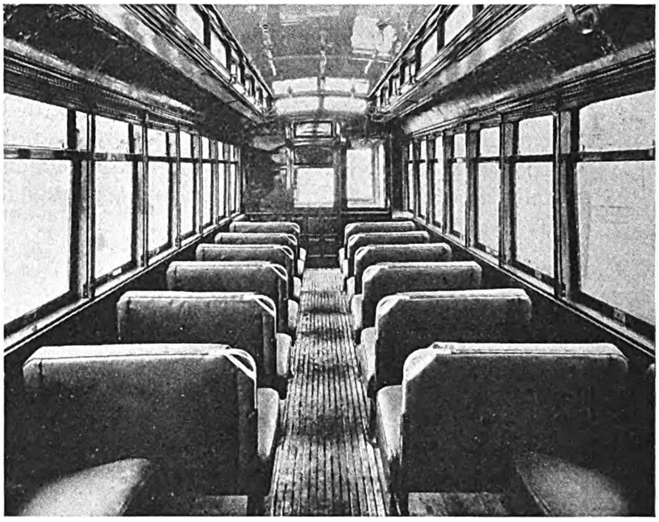
entrance, rear-exit, single-deck, pay-as-you-enter type. The rear door is controlled by a treadle step. In addition the rear door may be operated by compressed air from the driver's seat, the front door being similarly manipulated.

How successful this experiment will be it is still too early to determine, but the management is optimistic. If it proves as successful as is hoped this type of operation will be extended to other sections of the metropolitan area.

Cincinnati Remodels Interior of Cars

Electric Heaters and Cross Seats Installed in 21 Pay-as-You-Enter Cars—All Thoroughly Painted Before Return to Service

INTERIORS of 21 double-truck pay-as-you-enter cars were recently remodeled by the Cincinnati Street Railway, Cincinnati, Ohio. These were manufactured by the Cincinnati Car Company and originally had longitudinal seats to accommodate 34 passengers. Replacing these with twelve cross seats, two longitudinal seats on one end of the car and one longitudinal seat at the opposite end of the car has improved greatly the interior appearance as well as providing additional comfort for the passengers. The upholstering of these seats, which are of Hale & Kilburn manufacture, is in Spanish leather. The color creates a pleasing contrast with the mahogany stained interior finish and the cream headlining.



Full-upholstered Spanish leather seats are a feature of the new equipment

One Railway Utility Chromalox heater is installed under each cross seat and four are installed in the front vestibule. The cross seats are spaced at 31 in. centers and the seating capacity of the car with the new seats is 34.

The outside of the car is painted burning bush orange with cherry enameled sash, cream letterboard and cream window posts. A black stripe makes a very favorable appearance. Painting the trucks red and the roof slate gives a pleasing contrast of colors. Electric Service Supplies Company air-operated sand valves facilitate sanding. The remodeling of these cars was part of the 1926 reconstruction program.

The Men Who Are Responsible for th

Annual Maintenanc

# of Electric Ra

SEVERAL new features were included in the annual maintenance and construction issue of ELECTRIC RAILWAY JOURNAL dated March 19. A maintenance notebook section began with this issue and will be continued in the monthly maintenance and construction issues to supply desirable information on maintenance practices for the men who are actually doing the work. A very complete section was devoted to improved devices and equipment for carrying on maintenance work. The new and special tools illustrated point the way to reduced cost and higher grade maintenance workmanship.

The articles in the issue were written by men who have made outstanding progress in the improvement of maintenance practice. ELECTRIC RAILWAY JOURNAL takes this means of thanking them for helping to make this issue so successful by contributing of their time to tell the electric railway operators the results of their experience.

That the industry appreciates the efforts of those who contributed to the issue is evidenced by the many letters received from electric railway maintenance men throughout the country. The following are extracts from some of these comments:

JAMES E. DOOLEY, master mechanic New Haven Division of the Connecticut Company, writes:

"To my mind the maintenance data sheets of the JOURNAL of March 19 are what all equipment men need, so let this good work go on."

H. E. WEYMAN, manager Levis Tramways Company, comments in part as follows:

"I would like to congratulate you on your maintenance notebook section, which I think will prove a real help to the industry. I assume it is your intention to include track and overhead maintenance data sheets and special tools developed for the work, which will be of considerable interest. Some of the special tools developed by railway companies are very good and should lead to further developments and improvements."

E. S. FITZ, operating manager Gulf States Utilities Company, Beaumont, Texas, comments as folows:

"Your new maintenance notebook section, started in the March 19 issue, appears to me to be a step in the right direction, since these sheets will be available for filing much better than clippings that many of us have been taking out of the JOURNAL in the past. Our organization, I know, will be glad to contribute to this department whenever we feel that we have some ideas that would be of benefit to your readers."

J. L. SMITH, superintendent motor coach department, Toronto Transportation Commission, says in part:

"I have read the maintenance notebook section in your March 19 issue with a great deal of interest and I think that a full set of articles along this line will be very valuable indeed to electric railway men."

CLAUDE BRYAN, engineer of ways Wilmington & Philadelphia Traction Company, says in part:

"I have read very carefully the issue of ELECTRIC RAILWAY JOURNAL of March 19. Your maintenance notebook section starting in this issue is a mighty good thing and I think it will prove very valuable to electric railway men."

From H. A. LEONHAUSER, assistant superintendent of rolling stock and shops the United Railways & Electric Company, Baltimore, Md., comes this letter:

"Your annual maintenance number containing the new maintenance notebook section, as well as the JOURNAL in its entirety, appeals to me very much."

J. B. CORDERMAN, master mechanic Lima-Toledo Railroad, Toledo, Ohio, says:

"I think your annual maintenance number of March 19 is fine. It is a real help to the shop men and is good for the management as well. Any property that is worth operating should be in good condition."

JOHN LINDALL, superintendent rolling stock and shops Boston Elevated Railway, says in part:

"Please accept my congratulations on the many timely and interesting articles contained in your March 19 issue of ELECTRIC RAILWAY JOURNAL. Maintenance men will undoubtedly read this issue from cover to cover. Your proposition to provide a maintenance notebook section looks good to me, as it will enable maintenance men to have such notes in convenient form for ready reference. More power to you in the good work."

E. K. MILES, superintendent of transportation New York State Railways, Syracuse, writes:

"Your issue of March 19 leaves nothing to be desired from a maintenance standpoint. The description and explanation of shop equipment was exceptionally fine."

J. E. COLLER, division superintendent Pittsburgh Railways, comments as follows:

"I have read most of your annual maintenance number and I think it is very interesting and useful, and I hope to follow up the suggestions made."

Condition of Electric Railways Commend

and Construction Issue

way Journal

A. F. Rexroth, master mechanic Harrisburg Railway, says:

"Fine! I never saw a better number."

Frank E. Sheridan, master mechanic Boulder Street Railway, Boulder, Col., says:

"I wish to compliment you on the various articles on high class maintenance in your March 19 annual maintenance issue. They are very instructive to the maintenance man."

D. L. Fennell, superintendent of transportation Kansas City Public Service Company, writes:

"A very fine issue and in keeping with your high standards. I have read most of it with great interest. Why not have special issues devoted specifically to transportation practices, accident reduction, claims work and selling rides?"

D. E. Blair, general superintendent Montreal Tramways, says in part:

"Your issue of March 19 is very interesting. I would especially commend the maintenance notebook section. My experience is that most of the small repair shops around the country are equipped very badly in the way of reference data."

Nels C. Rasmussen, superintendent Wisconsin Valley Electric Company, Wausau, says:

"You struck the right idea. This certainly will be the best reference library that the operating men have ever had. Wish you luck in this good work."

Herman Eickhoff writes from Philadelphia as follows:

"In conducting any business efficiently and progressively, it is absolutely necessary continuously to inform ourselves of what and how our competitors are proceeding and the ultimate results accomplished. Your annual maintenance number of March 19 gives just such information. I am sure that it is welcome to the great majority of your readers. Permit me to congratulate you upon the timely improvement."

W. J. Smith, master mechanic Twin City Lines, Minneapolis, says:

"I was very much interested in reading the articles in your March 19 issue. Am sending a note to all the foremen in this department asking them to read the various articles."

Horatio Bigelow, superintendent of railway South Carolina Power Company, Charleston, writes:

"My compliments on your March 19 issue of the JOURNAL. I am pleased particularly with the maintenance notebook section. So often a problem arises, you remember a solution suggested in the JOURNAL, but it takes time to spot the article. The maintenance notebook will help in this regard. I suggest that comparative pull-in records and maintenance costs be included in this section, if possible."

J. W. Hulme, assistant superintendent of car equipment Interborough Rapid Transit Company, New York City, says:

"The maintenance number of ELECTRIC RAILWAY JOURNAL for March 19 was a big success and fills a much-needed want. I consider it the most progressive step the JOURNAL has ever taken."

A. F. Townsend, local manager Northern Texas Traction Company, Fort Worth, Tex., says in part:

"We have received and read the annual maintenance number of the JOURNAL with a great deal of interest. This is a splendid edition and reflects a great deal of work and thought upon the part of those responsible for it.

"I think the notebook section, starting in this issue, is an advanced step in trade journal work, and will be of great value to the industry as time goes on."

Niles Persons, master mechanic Schenectady Railway, makes the following comments:

"I have read the March 19 annual maintenance issue or ELECTRIC RAILWAY JOURNAL with much interest and do not hesitate to say that it is one of the best issues I have ever read. I was particularly interested in the article and pictorial section of the new DeKalb Avenue shop of the Brooklyn-Manhattan Transit Corporation."

From **P. W. J. Smith**, superintendent New York, Westchester & Boston Railway, comes the following:

"I think the March 19 issue was fine. The articles on proper maintenance had the kick that most of us need, and if followed properly should bring about considerable good to all departments. We obtained many good points from this issue from the experience of others."

R. A. Bird, Portland Electric Power Company, Portland, Ore., says:

"Being a transportation man, I do not know much about the maintenance part of the business, but I enjoyed the March 19 issue of ELECTRIC RAILWAY JOURNAL very much and got a lot of valuable information from reading it."

J. W. Knecht, superintendent Grand Rapids Railway, said:

"I enjoyed the March 19 issue of ELECTRIC RAILWAY JOURNAL very much. A maintenance issue always creates much interest among operating employees. The maintenance notebook feature is excellent and should be read by all equipment employees."

H. A. Davis, superintendent of railway Nashville Railway & Light Company, commented in part:

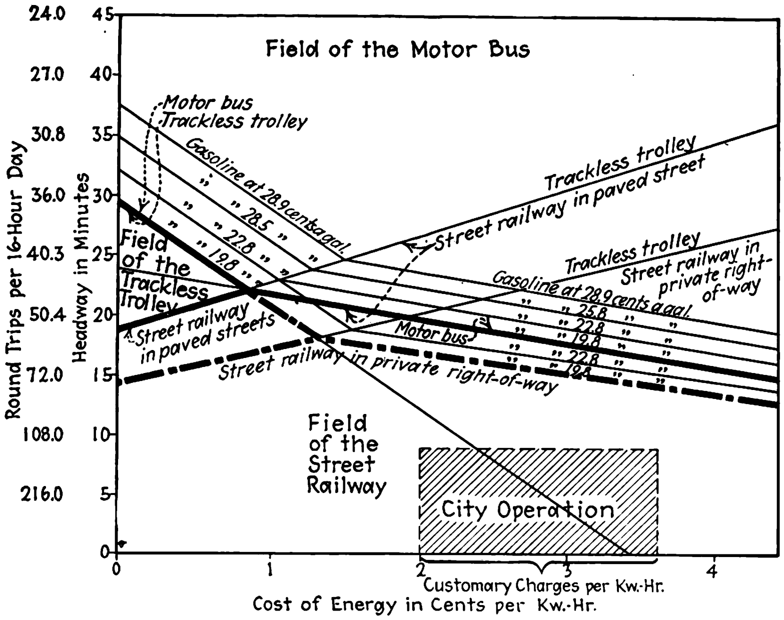
"Your annual maintenance number is a great step forward in solving one of the greatest problems any company has to contend with. I do not believe that we have yet awakened thoroughly to the realization that poor equipment inefficiently maintained will soon demoralize an entire organization—with disastrous results.

"It is equally important that each employee in the mechanical department know his job and be trained thoroughly in the performance of his duties, in order that unnecessary loss of time be eliminated. Old material and old and worn-out equipment help to demoralize the organization. Keep up the morale of your employees by keeping up the equipment, is my advice to any organization. We congratulate you upon this maintenance issue."

Choice of Motive Powers in City Service

Economic Merits of Electric Railway, Trackless Trolley and Motor Bus Operation Charted by Dutch Engineer

GRAPHICAL presentation of the conditions under which each of the three modes of city transit, namely, electric railway, trackless trolley and motor bus, would be the most economical under any given set of conditions has been essayed by P. M. Montijn of the Hague, Holland, Tramway company. In an article in *Verkehrstechnik* for Nov. 26 he works out the basic formulas. In doing this he has taken the costs of the various items as they apply in Holland, but explains that the method is applicable to other conditions if the constants used are changed to fit the particular problem considered. In converting Mr. Montijn's financial data and conclusions to dollars, the Dutch florin has been taken as worth 40 cents. His initial assumptions follow:



This chart shows the fields of the electric railway, trackless trolley and bus under Holland double-track operation conditions

A_s = cost per mile of track, overhead line and feeders for street railway
- (a) single track in paved streets............$22,400
- (b) single track over own right of way (including real estate)............... 32,000
- (c) double-track line in paved streets........ 38,400
- (d) double-track line over right of way...... 51,200

A_t = cost per mile of overhead line and feeders for trackless trolley
- (a) single line with two overhead conductors.$14,080
- (b) double-track lines with two overhead conductors 18,560

t_s = interest and sinking fund on A_s
- (a) when laid in paved streets.......... 8 per cent
- (b) when over private right of way. .... 7 per cent

t_t = interest and sinking fund on A_t......... 9 per cent

t'_s = interest and sinking fund on first cost of the street railway cars............. 7 per cent

t'_t = interest and sinking fund on first cost of the trackless trolley buses............12 per cent

t'_a = interest and sinking fund on first cost of the motor buses......................16 per cent

a_s = maintenance per car-mile in cents of track and overhead on the street railway................0.9

a_t = maintenance in cents per bus-mile of the trackless trolley overhead line................0.5

b_s = maintenance in cents per car-mile of the street railway car...................................3.2

b_t = maintenance in cents per bus-mile of the trackless trolley bus..........................6.4

b_a = maintenance in cents per bus-mile of the motor bus 8.3

B = first cost of a car or bus for 35 passengers (same for each of the three systems)......$6,000

p_e = cost in cents of a kilowatt-hour .... 2 to 3.6

p_b = cost in cents per gallon of gasoline (or "benzine")* ....19.8 to 25.8

c_s = kilowatt-hours per car-mile for the street railway 0.8

c_t = kilowatt-hours per bus-mile for the trackless trolley 1.6

c_a = gallons of gasoline per bus-mile for the motor bus 0.17

m = average distance in miles covered by each vehicle in a day.......................................109

Reserve rolling stock for time spent in shops and extra trips of 20 per cent is assumed for all three types of transit, although the author says that actually a smaller reserve would be required for the railway than for either bus system. The assumption is made that the street car will have a life of 30 years, the trackless trolley of twelve years and the motor bus of eight years, with an average daily performance for each of 109 miles as already mentioned. No charge for the use of the streets by the buses is included, but the railway track maintenance expense includes the paving charges paid at present by the Hague Street Railway.

From these data the author develops a series of formulas for the yearly cost of operation with each kind of motive power, and on the basis of these formulas two charts were prepared. One is for single-track operation and the other for double-track operation. The latter is reproduced on this page. That for single-track operation has a somewhat similar form.

In discussing the double-track chart the author points out that it shows that even with energy as low as 0.4 cent per kw.-hr. the field of the trackless trolley, as compared with the street railway, would lie only between headways of 17 and 26 minutes for the railway built over private right of way and between 20 and 26 minutes as compared with the railway laid in paved streets. Hence, even at this low cost of energy, the area of the field for the trackless trolley is so small and restricted that a slight change in the headway of the service given would throw the trackless trolley into the field of economic disadvantage. Of course with these long headways the railway would probably be single track, not double track, and the opportunity for the trackless trolley would be even less. Finally, with electrical energy costs at the usual figure of from 2 to 3.6 cents per kw.-hr. the choice really lies between the electric railway and the motor bus.

The author then discusses the fields of the motor bus and trolley and also calls attention to the rectangle in the lower right-hand side of the chart marked "City operation." It will be noticed that this rectangle includes all headways of less than nine minutes where electrical energy can be purchased within the limits of from 2 to 3.6 cents per kw.-hr. These are the customary rates in Holland, so that this area represents the usual conditions of city operation. The author points out that it is well within the area on the chart representing the field of the street railway. Still another advantage of railway operation, not shown in the chart because the chart is based on the use of single units only, is the railway's far greater adaptability to the operation of trailers.

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*The figures in this calculation are based on the use for fuel of benzine which is the customary fuel in Europe instead of gasoline. The word "gasoline" is used in the chart and elsewhere in this article so as to make the formulas more easily usable by American users.

In conclusion, the author compares the results of his study with those reached by Victor Topping in an article in the ELECTRIC RAILWAY JOURNAL for Aug. 25, 1923. Although the basic conditions in the Canadian example discussed by Mr. Topping vary considerably from those in Holland, the conclusions reached by the two investigators are considered by Mr. Montijn to be not very far apart.

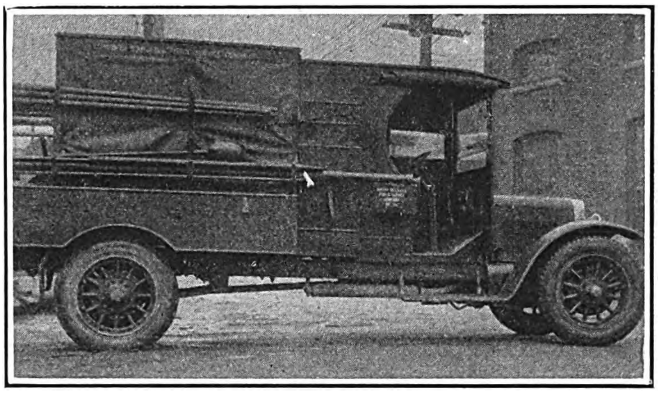
North Carolina Public Service Builds Construction Truck

BELIEVING that a construction truck body containing certain unusual features could be built cheaper in the company's shop, led C. M. Seawell, master mechanic of the North Carolina Public Service Company, Greensboro, N. C., to design and construct such a body.

A General Motors Corporation truck chassis, model K-32, having a weight of 3,943 lb., was purchased. A semi-inclosed body made of well-seasoned oak timbers was erected on this chassis and reinforced with heavy angle braces, bolted securely to the chassis. The roof consists of ⅜-in. pine boards fastened to 1-in. x 3-in. oak cross-beams and covered with heavy canvas, finished with several coats of paint to make it weatherproof. The flooring is made of 1-in. oak planking. Suitable drop curtains on either side of the body inclose the sides during inclement weather.

A multiplicity of strong hooks and racks inside and outside of the body provide for carrying all of the necessary working tools and equipment, such as ladders, rope and shovels. Spacious weatherproof oak tool boxes, extending the entire length of either side of the body as well as under the driver's seat, provide storage for additional tools and equipment. A 6-in. steel channel erected at the back end of the roof, and a similar channel installed on the chassis extension at the end of the floor provide a strong support for a chain hoist or a pole-lifting boom and gaff when required. The completed body weighs 1,200 lb. and the truck has a capacity of 8,143 lb. This truck, with its attractive appearance, spacious interior, complete tool equipment and speed, has met every purpose for which it was designed.

Rear view of truck showing rugged construction and spacious interior



Side view of truck designed and built by North Carolina Public Service Company, showing symmetrical appearance, tool boxes and method of carrying tools

This Advertising Should Draw

RAILWAY advertising in Australia has a new form. The railway stations on the Sunday suburban lines have earthen platforms built up to about the height of the floors in the car. These platforms run the full length of the trains and are usually finished with white gravel, little garden plots and ornamental shrubs, which are tended by the station staff. About a quarter of the space of each platform is under shelter for protection against bad weather, the remainder being open.

These advertising cabinets usually stand on the central platform of suburban stations and the advertisements can be seen by people waiting for trains or in passing trains, some of which stop at the station. The cabinets are of wood with a tiled roof and a little garden plat at the foot, with hanging baskets of ferns, etc. They are glazed, the glass being held by a nickeled frame, and have a stylish look. The advertisements are painted or on printed cards, which can be changed as desired by unlocking the glass frame, which swings out on hinges. The cards are narrow strips of various colors, with a good deal of small sign writing on them. the idea being that people who are waiting for trains will have time to read the small type, though people any distance away could not do so.

Most of the frames now are divided into four spaces on each side and rectangular cards, about 30 x 40 in. occupy each space. The colored designs behind glass look very well.

The advertisements are used mostly by the theaters and for sports meetings and other "topical events." Many of the people who work in Sydney live in the suburbs and a very large number of them travel by train, so that the advertisements reach a large clientele.

The advertising rights are let to an agency, which sublets to advertisers, and frequent changes of advertisements are the rule.

Maintenance Notes

Motors Rebuilt to 95 Per Cent Condition

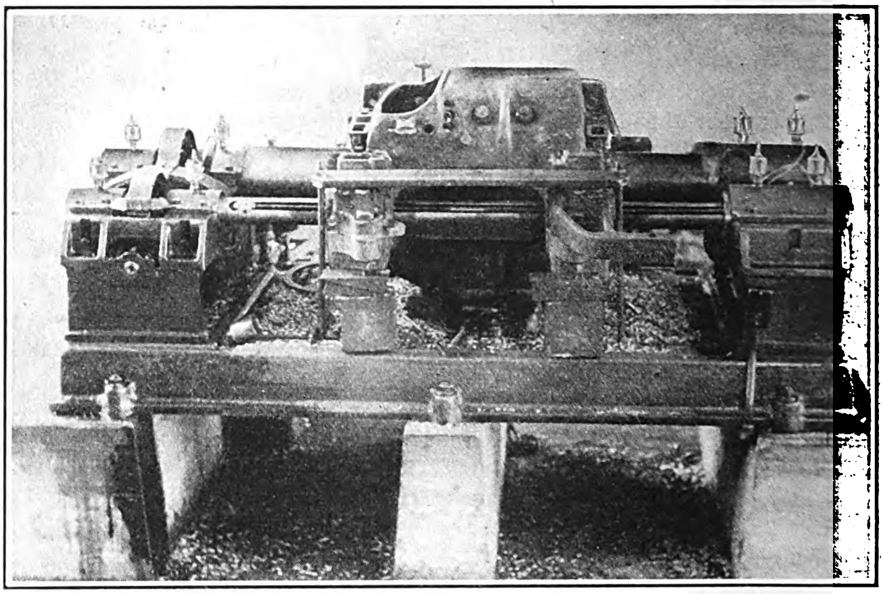
SPLIT-FRAME motors which have seen years of service on the Los Angeles Railway are so reconditioned in the shop that the machines, which are Westinghouse 306-L, are comparable with new. Armatures are completely rebuilt, shafts straightened and bearings refinished. The split frame requires considerable reconditioning. The adjoining faces of the two halves are built up by electric welding and then planed off so that the frame when finished is exactly the original size and shape.

The two halves are bolted together, with 0.006-in. liners between, and placed on a double spindle boring mill, which machines the fits for axle bearings and armature housings. These openings are bored to ⅛ in. oversize. It is necessary to furnish oversize axle bearings and armature housings to fit the reconditioned motor case.

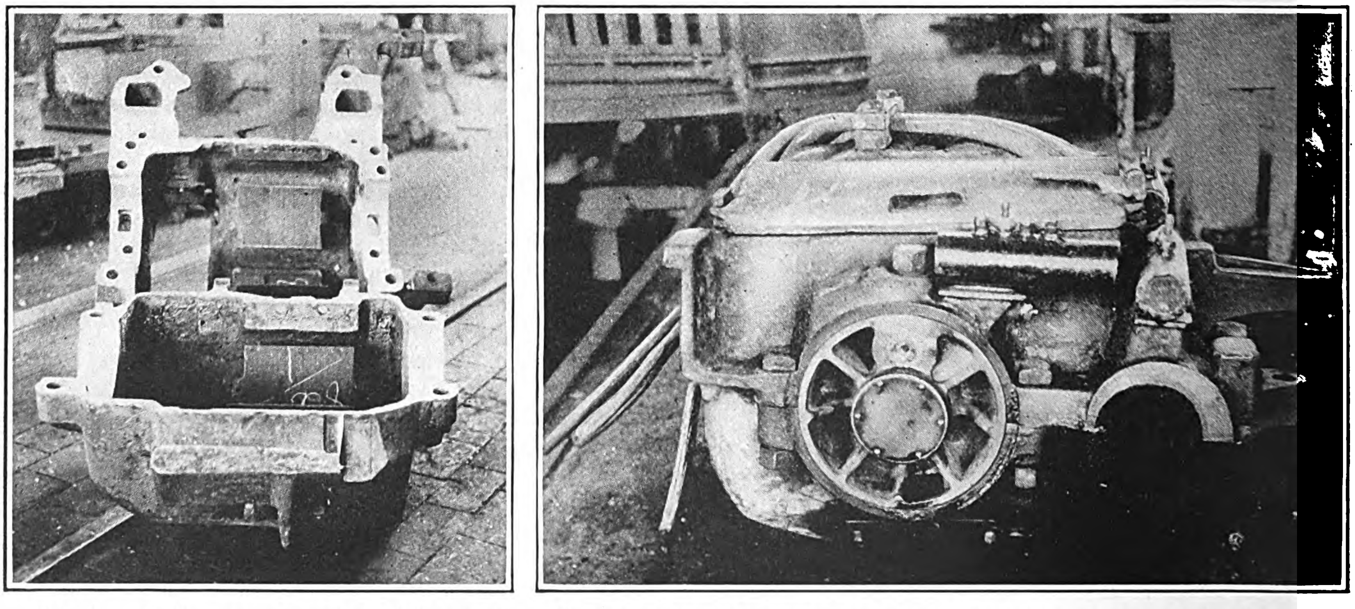
After the case has been finished Rico automatic oilers are fitted to armature bearings and axle bearings. Installation of this type of oiling equipment is standard on the property as this type of motor goes through for reconditioning.

The machine on which the case is bored was constructed in the shop to do this particular job. It is small, compact and simple. This latter feature is made possible with the split case to be bored. The spindles which carry the boring bits revolve in large bearings. These spindles are driven by a worm gear from a small electric motor mounted at one end of the machine. The four cutting bits are held in collars, each driven by its shaft through a single spline, in which is the feed screw. Both right and left hand threads are cut on these feed screws, one-half of the length being cut with each. This makes it possible to feed both cutting tools from the outside of the work to the center with one feed screw. A five-pointed star carried on the end of the feed screw serves as a pick-up for advancing the tool into the work. A dog on the frame of the machine engages a point of the star pick-up every time the main boring shaft makes a revolution.

Particular attention was paid to obtain approximately the same cutting speeds of the tools working on



Motor cases being reconditioned in Los Angeles have openings for axle bearing and armature bearing housing bored on double-end horizontal boring machine



At left, split-frame motors have joints built up by electric welding and then refinished by planing and boring. At right, completely reconditioned No. 306-L split-frame motor with Rico oilers on armature and axle bearings the large diameter cut, or the armature housing, and the tools cutting the small bore, or the axle bearing. The larger bore is 11⅝ in., while the smaller is 5⅞ in. Therefore, the boring bar working on the axle bearing opening was to run at twice the revolutions of the armature bearing housing boring bar. The feed screw for the smaller boring bar is ⅝ in. with eleven threads to the inch, while the other is ¾ in., with ten threads to the inch. As the length of bore for the smaller hole is approximately twice that of the larger hole, the machine takes care of itself automatically once it is started.

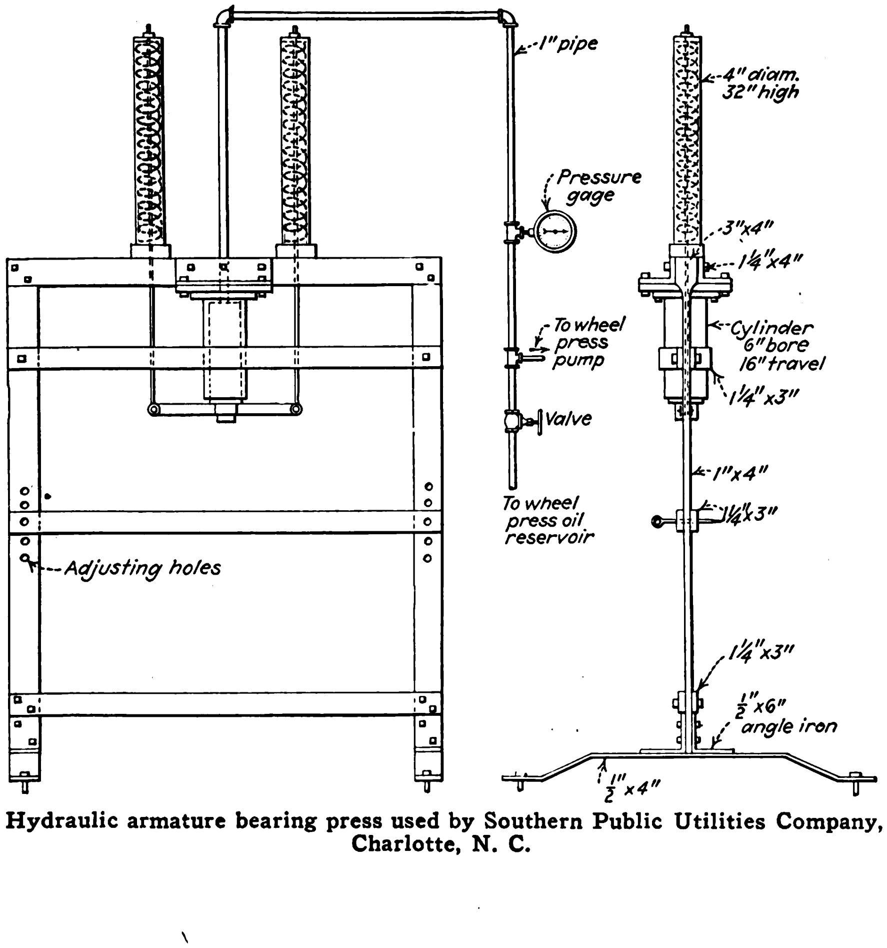
In setting up the machine a disk carried at the center of the large boring bar is clamped between the four pole pieces of the motor case. This centers the hole for the armature bearing housing accurately with the large boring bar. The small boring bar is aligned by raising that side of the case by small jacks. After final alignment the case is clamped to the base of the machine. These clamps are clearly shown in the accompanying illustration of the machine.

Don't be a "pacifist," but be "prepared."
Keep your "snow fighting" equipment repaired.

Armature Bearing Press Operated by Oil Pump from Wheel Press

PRESSING out armature bearings was a very slow and tedious process in the shop of the Southern Public Utilities Company, Charlotte, N. C., until the master mechanic, W. D. Osborne, designed and constructed a hydraulic press in the shop.

This press is operated by the oil pumping equipment of the wheel press. The framework consists of two uprights of 1-in. x 4-in. steel bars that are tied together by steel bars 1¼ in. x 3 in. and 1¼ in. x 4 in. These cross bars are horizontal and are bolted to the uprights. A pressure cylinder having an outside diameter of 12 in., an inside bore of 6 in. and a 16-in. travel is fastened to the two 1¼-in. x 4-in. top cross braces. Two 1¼-in. x 3-in. steel bars encircling the circumference of the cylinder, one on either side and fastened to the uprights, act as steadying clamps for the cylinder. When the pressure is released from the cylinder the ram is returned to the release position by two 3½-in. diameter coil springs, 32 in. long, which are incased in a cast-iron cylinder. Each of these springs is connected to the ram by means of a ¾-in. round iron rod passing through the center and connecting with a ½-in. x 2½-in. clamp fastened to the ram. These connecting rods are threaded on one end and are provided with a nut to permit of adjustment. A 1-in. pipe line between the armature bearing press cylinder and the wheel press pump has a valve mounted near the armature bearing press, which allows for a gradual pressure application. A gage in the pressure line indicates the pressure being applied.



Hydraulic armature bearing press used by Southern Public Utilities Company, Charlotte, N. C.

Each upright is drilled with five adjusting holes to allow for the raising or lowering of the tailstock bars to take care of various sizes of armature bearing heads. The press framework is fastened to two ½-in. x 4-in. U-shaped brackets by means of ½-in. x 6-in. angles. The press is designed to have a maximum capacity of 30 tons.

Aluminum Covering for Stanchions

By H. S. WILLIAMS
Assistant Superintendent of Equipment Department of Street Railways, Detroit, Mich.

MAINTAINING iron pipe stanchions on the older cars has been an annoying problem for many years. No paint has proved adequate to protect them, and complaints from passengers and crews regarding rust getting on clothing have been most annoying. The Department of Street Railways of Detroit has recently developed what seems a very effective plan for overcoming this difficulty.

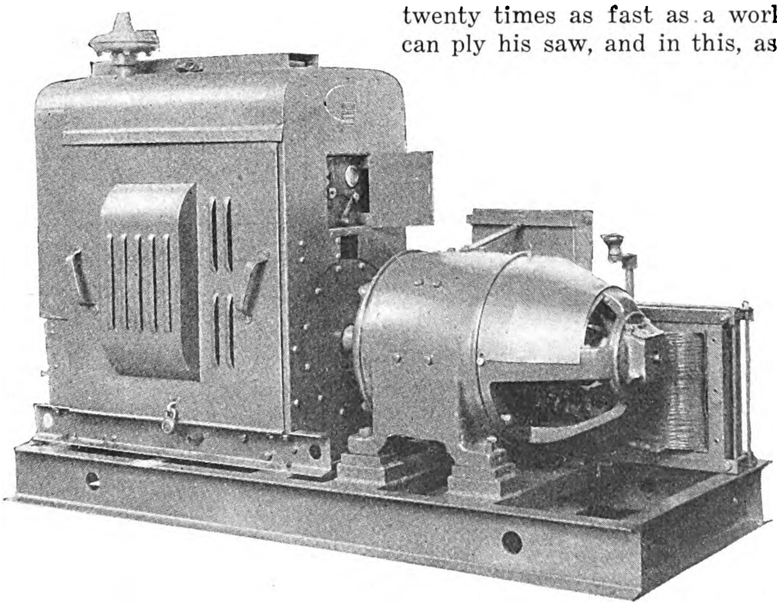
Not wishing to go to the expense of replacing the stanchions on old cars that are near their time of retirement with aluminum or a vitreous enameled pipe and yet being desirous of securing a non-rusting stanchion, the practice has been adopted of slipping a piece of thin aluminum tubing over the old iron pipe. This aluminum tube has a 0.022-in. wall and is just the right diameter to slip over the old stanchion. The old fittings are retained, but before the aluminum tube is placed the outer end of the threaded part is chamfered with an ordinary burring reamer just sufficiently to give a socket effect to receive the end of the tubing. This furnishes a finish to the tube and assists in holding it tightly when the fittings are in place. The fittings are painted with aluminum bronze. It is not necessary to cover any part of the stanchion except that coming in contact with the passenger's hands. Short sections may be covered, if desired, a collar being used at either end to hold the tube and give proper finish.

New Equipment Available

Small Gas-Engine-Driven Welder

PARTICULARLY for shop and garage use where electric power is not available, a small gas-engine-driven outfit incorporating the WD-11 generator with a continuous rating of 150 amp., a one-hour rating of 200 amp. and a welding range from 50 to 250 amp. is announced by the General Electric Company, Schenectady, N. Y.

The generator is driven by a Continental P-20 power unit rated 18.22-hp. S.A.E. and capable of developing 23.5 hp. at 1,400 r.p.m. The generator is equipped with a control panel, rheostat and self-adjusting stabilizing reactor. The engine accessories include a strongly constructed radiator, pressure fed lubricating system with oil pressure gage and indicator, vertical tube gravity feed carburetor, air cleaner, centrifugal governor, starting crank, 10-gal. gasoline tank, tool box and sheet metal hood with sheet metal side panels which can be locked in place.



Shunt generator direct connected to a gas engine

Among the advantages of this combination are low first cost, light weight and reliability. It is stated that tests have shown the outfit capable of standing up under hard service and overloads. The set is mounted complete on a structural steel base so designed as to facilitate easy moving from place to place.

Air-Driven Portable Hand Saw

FIVE times the work of an ordinary hand saw is the ability of a compressed-air operated portable saw devised by the Ingersoll-Rand Company, New York, N. Y. By a shift of blades, the pneumatic hand saw may be put to work in sawing wood, soapstone, Bakelite, wallboard, cables, copper and other materials. Cross-cut or rip blades for different types of work are available. It cuts timber, does trimming work on buildings and scaffolding and can be used by railroads in car repair work.

In sawing wood the portable air-driven hand saw can be operated twenty times as fast as a workman can ply his saw, and in this, as well as in all other work, it can be operated continuously without fatigue to the operator. Its weight is such that it can be carried about and handled easily by the workman. The 8-in. size weighs only 23 lb.

One outstanding feature of this new air saw is its safeguard against accidents. The design combines the Ingersoll-Rand three-cylinder type of air motor, long in use in I-R grinders and lightweight drills, with the Crowe safety saw guard.

The air-driven hand saw speeds work and reduces accidents

The safety guard is of a telescopic nature. It opens when the saw is applied to the material and it closes automatically and locks in position as the cut is completed. It affords complete protection against accident or damage to the blade. The saw guard has an adjustable stop so that the saw can be set for the required depth of the cut.

The three-cylinder air motor is of the balanced type, smooth running and free from breakdowns. All wearing parts, including the cylinders, are renewable. The cost of upkeep of this safety saw is almost negligible. It is being manufactured in three sizes, known as B6, B8 and B12 and takes 6-in., 8-in. and 12-in. blades, respectively.

Joints Sealed Against Oil Leaks

PAINT which is said to seal effectively joints against oil leaks has been developed by the General Electric Company and is sold by its merchandise department at Bridgeport, Conn. The product, known as G-E No. 880 red protective paint, also prevents water and gas leaks. It can be used for many purposes that require red lead or white lead, and is less expensive than either.

The paint, which is dark red in color, requires no priming and can be applied by brushing or dipping. Denatured alcohol is used as a thinner. It dries rapidly and produces a hard, smooth, glossy film that is cleaned easily and that prevents excessive collection of dirt and conducting material, thereby decreasing surface leakage and subsequent carbonization of the surface when used with electrical apparatus.

Association News & Discussions

Car Maintenance and Shop Practices*

By J. D. Barnhart
Superintendent of Shops Illinois Traction System, Decatur, Ill.

UNTIL other means were provided, it was our practice to raise one end of a car with a stirrup attached to the hook of a 15-ton traveling crane and to move the trucks from underneath the car with pinch bars. This required the men to be under the car while it was suspended in the air, and as the weight of some of the trucks is as high as 30,000 lb. considerable time was required to do this work.

All our truck work is done on two parallel pits, each 150 ft. long and 16 ft. between centers. This arrangement lent itself quite naturally to the installation of an endless rope haulage system for moving trucks back and forth. This consists of an endless ⅝-in. steel cable, a driving engine, a tension adjuster, guiding sheaves, cable supports and a clutch.

The driving engine has a base of structural steel on which is mounted the brass bearings for the drum and gearing shafts. Two drums, 24 in. in diameter, are grooved for passing the cable three times around in the elliptical arrangement to obtain sufficient friction for driving. The driving power for operating the drums is furnished by a Westinghouse D-2-EG compressor motor driving through a triple reduction gearing so as to move the cable no faster than 20 ft. per minute.

Details of Drive

The tension adjuster is made up of two 12-in. stationary sheaves and an adjustable sheave which is anchored to a fixed position by a screw that takes up the slack as the tension demands. The driving engine is located in a pit between tracks at one end of the car pits and the tension adjuster is located in another pit at the other end. The cable is located 28 in. below the top of the rail and 3½ in. from the face of the pit walls on the near sides of the two parallel pits. It is far enough below the trucks so that there is no interference. Four 12-in. sheaves are used at the four corners where the cable passes out of the pits. At distances in the pit of 6 ft. hard wood blocks with grooves cut in them are used to support the cable.

A steel bar with a cable grip which can be closed or released with a lever serves as the connecting link between the truck and the cable. The controller for operating the motor is located in a small pit between tracks and midway between the ends so that the operator is as close as possible to the truck being moved and the man giving signals for his guidance.

Another outfit which has proved worth while at our shops is the air lift used for removing and replacing compressors. Up to the time of the installation of this lift it was our practice to crib up under the compressors, which weighed as high as 1,600 lb., and spend from an hour and fifteen minutes to an hour and 30 minutes of four men's time in removing and replacing one of these compressors. With the lift two men can remove and replace a compressor in twenty minutes. The lift is located under the near rail of the track at a point opposite the door to the air brake department. Four 8-in. x 12-in. cylinder bodies bolted together in pairs are mounted on a 10-in. supporting concrete wall, one pair on each side of the wall. Two cylinders are used on account of the height of lift required.

The lift is sunk in the ground so that it does not interfere with the traffic over the track. In using the lift it is necessary to remove a 4-ft. section of rail and its supporting sill. When these pieces are removed the top of the lift table is about 10 in. below grade. A concrete ramp 7 ft. long extends from the floor of the air brake department to the table of the lift and a roller bearing carriage 4½ in. in height is provided for moving the compressors over this ramp from the track to the air brake department, or vice versa.

COMING MEETINGS
OF
Electric Railway and Allied Associations

April 4—Birney Club, regular meeting, Missouri Athletic Club, St. Louis, Mo., 6:30 p.m.

April 13-14—National Automobile Chamber of Commerce, meeting, Chicago, Ill.

April 20-22—American Society of Civil Engineers, spring meeting, Kenilworth Inn., Asheville, N. C.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

April 27-29 — American Welding Society, eighth annual meeting, Engineering Societies Building, New York City.

May 6—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

June 29-30—Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

Our babbitt furnace includes two 1,000-lb. pots set side by side in a cast-iron top that rests on the brick walls of the coke burning furnace. A hood over the pots connects with the furnace flue and provides a means of escape for the fumes from the pots. One of these pots is used for melting babbitt and the other for the tinning alloy. Our babbitt furnace does not have the automatic control, yet the babbitting of our armature bearings has been uniformly successful.

Thin Babbitt Lining Used

We have our own brass foundry and cast our own armature bearings, so that we babbitt both new and worn bearings. New bearings are made special for each armature. The babbitt lining is limited in thickness to 1/16 in. and as the armature shaft journals vary, it is necessary to make the bronze shells special for each motor. One-sixteenth of an inch is the limit of wear allowed on armature bearings and a greater thickness of babbitt is not needed; in fact, it is not desired, for with too thick a lining of babbitt it would be possible, should a hot bearing develop, for the armature to get down on the pole piece and be ruined before the hot bearing was discovered. The boring of the babbitt lining is also special for each bearing; the bore is made 0.012 in. larger than the shaft diameter.

While the bearing shell is still warm from the tinning process it is placed in the jig for babbitting. This jig is a device for centering the mandrel in the bearing shell. The gate, which fits the bearing opening closely, is clamped in position and the tapered steel mandrel, heated to a point just below that at which water sizzles on it, is painted with a solution of graphite and water and put in place. The bearing is then ready for babbitting. When the temperature of the shell is held at a sufficiently low degree it is not necessary to block the chinks around the gate, for the babbitt solidifies immediately on passing through these crevices. A self-skimming ladle of sufficient capacity to pour a bearing without stopping is used.

In the machine shop the bearings are bored out for the particular journals they are to fit and the oil grooves cut in them. Except for the GE-69 motors, we have found that these bearings pressed into the frame heads are ready for service without any additional work done to them. When bearings are pressed into the frame heads there is a slight corrugation of the babbitt along the window side of the bearing. A micrometer adjustment expansion reamer is run through these bearings after they are in the heads and the ridges of metal in the corrugations removed.

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*Abstract of paper read before the Illinois Electric Railways Association, Springfield, Ill., March 17, 18, 1927.

Spray Gun System of Painting

The spray gun system of painting is now used at our shops for painting all classes of car equipment. Before adopting this method of painting, we learned that painters generally were not kindly disposed toward its use, so we broke some laborers into the use of the spray paint gun. When this apparatus was first put in operation considerable difficulty was experienced by the operator in getting a somewhat uniform coat and avoiding piling up paint and causing curtains and runs in the work. To overcome this difficulty a helper followed the operator and brushed out the paint with an 8-in. wall brush. However, as the operator became more experienced in handling the gun it was found that there were fewer curtains and it was not long till the helper's assistance was no longer needed.

As practically all our freight car work is done in the open, the freight car painting is confined to the summer months. The season extends through three months, and during this time two men, the spray gun operator and the stenciler, turn out on an average 100 cars per month. Flat cars, flat bottom and side dump coal cars, hoppers, box cars, express type trailers, refrigerators and cabooses are run through together.

In the last two years the adoption of the spray gun in applying lacquers to automobile bodies has brought to our painters the realization that they must learn the use of this new tool if they are to keep abreast of the times in their trade. When we decided to adopt the spray gun system of painting our passenger cars we brought to our shops an experienced spray gun operator and had him stay on the job a week to show the men the use of the spray gun in applying primer, surfacer, enamel and varnish to the cars. The great saving in time required for the various operations was a revelation to the men, and from the start they welcomed the opportunity to duplicate the feats of the expert. The men doing the spray gun painting of our passenger cars are old, experienced painters, who were accustomed to turn out a high-class job with the brush, and since they have proved to themselves that they can do as good a job with the spray gun in much less time the brush has been abandoned for work on the outside of cars except for color varnishing the sash. A comparison showing the time required and the amount of material used in the operations where the spray gun has been substituted for the brush is shown below.

The figures for the spray gun do not include the time required in filling the paint pressure tank nor the time required to clean the apparatus after it is used. When the same operation is carried out on a number of cars cleaning is required after the last operation only. Under any condition, however, three-quarters of an hour is sufficient time for doing this work thoroughly.

In this work no guards are used at the windows. It is much more satisfactory to coat the window lights with a good coat of glycerine, which, we find, can be removed more quickly with gasoline than with alcohol or a vinegar solution.

COMPARATIVE STATEMENT OF LABOR AND MATERIAL REQUIRED FOR HAND AND SPRAY GUN PAINTING

	By Hand		Spray Gun	
	Labor, Hours	Material, Gallons	Labor, Hours	Material, Gallons
Painting roof, one coat	4	1½	1	2
Applying surfacer, two coats	8	2	3	2½
Applying colored sealer, one coat	6	1	1¼	1½
Enameling, one coat	9	1	2	1½
Varnishing, one coat	9	1	2	1½
Painting underframe, one coat	9	2½	¾	2½
Painting trucks	6	1½	½	2
Total	51	10½	10½	13¼

Track Maintenance*

BY JONATHAN WOLFE

Assistant Superintendent of Track and Roadway Chicago Surface Lines

Our track and roadway department handles both maintenance and all renewal and construction work and is in charge of a superintendent of track and roadway with an assistant. There are four division superintendents, with a total of thirteen maintenance sections. In every division there are two construction gangs, each under a general foreman, these gangs handling construction and renewal work.

There are 31 switch cleaning districts, each taken care of by a switch cleaner reporting to the section foreman of his district. His duties include cleaning all switches and curves, testing mechanical switch protection devices, cleaning drain boxes and inspecting the tracks while riding between locations. These switch cleaners inspect every switch in their district daily.

Emergency men are kept on duty during the night hours at logical locations, the dispatcher reporting any trouble to the man located closest to the trouble, sending the emergency man to make the necessary repairs. When he finds he is unable to handle the trouble himself he calls out other men. If the track is dangerous for car operation, he stays there to flag the cars, having the train crew call necessary help to make the track safe until permanent repairs can be made.

The value of our power tools and equipment has increased 200 per cent in the last four years and we feel that we are entirely justified in carrying this large item because of the great savings accomplished. There is scarcely a machine which does not save its original cost in less than a year's time. The principal power equipments in use are as follows:

We use two sizes of air compressors. The larger unit, of 360 cu.ft. capacity, primarily for large construction jobs, mounted on a four-wheel rubber-tired trailer, operates eight tie tampers or four concrete breakers continuously. When breaking out concrete foundation this equipment, with an operator and four men, will do the work of 25 to 30 men. Each of our four track divisions employs these large compressors.

A smaller unit, mounted at present on a 1-ton truck chassis, operates four tie tampers or two concrete breakers. This equipment is valuable for cutting in rails to repair broken joints, renewing frogs, switches, etc., or for any work where paving or concrete must be removed on a small stretch of track. Being mounted on a truck, this equipment is moved quickly from one location to another and has greatly expedited maintenance repairs where concrete must be chipped out. We propose to add to this equipment for our work this year.

Mixermobiles Place Concrete

For placing concrete we employ Mixermobiles, each mounted on a 1-ton truck chassis, the concrete mixer being run by the engine of the truck, having 20 hp. available. The levers on the Mixermobile are so arranged that they can be operated either from the driver's seat or from the ground. The capacity of the mixer is 7 cu.ft., one batch of thoroughly mixed concrete being made per minute. This mixer will not only handle the concrete required for rail cut-ins and small jobs, but will take care of large installations of special trackwork. We also use this machine on rail renewals, as the amount of concrete to be replaced around the base of the rails is not sufficient to warrant use of the large mixers.

For our extension and reconstruction work we use Chicago mixers mounted on cars and Drake continuous mixers, both running on the tracks, so that concrete can be placed as desired. With the Drake mixers we also use bucket loaders for raising the concrete materials from the street to the belt of the machine, these materials being spread beforehand in a continuous pile along the street.

We have also a large number of grinding equipments, all electrically driven, using for each class of work the type of equipment which we believe proves most efficient. For grinding electric seam-welded joints and electric welds on special trackwork, both manganese and high carbon, rotary grinders, with 7-hp. motors, of the Atlas type are used. For thermit welds reciprocating grinders of the Vulcan type give a smooth surface free from any hollows.

Electric hand grinders are used for grinding the throatways of manganese mates and frogs where one run is used much more than the other. Thus emergency curves, of which there are a great many, particularly in and adjacent to the Loop district, are kept in good operating condition. We never know when emergency operation may be started—a large fire or an accident in the Loop, a bridge out of service—any of these things may cause the cars to be rerouted, frequently with no advance notice given to the track department.

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*Abstract of paper read before the Illinois Electric Railways Association, Springfield, Ill., March 17, 18, 1927.

In each of our two frog shops we have a flexible shaft grinder which is proving valuable for grinding the welded throatways for flange bearing in shop-built frogs. These grinders are several times as fast as the hand grinders and do away with the necessity for bringing in larger grinders from the street.

Rail Corrugations Ground

For the removal of rail corrugations we have six Kerwin grinder cars. All of these have been double-ended and 40-hp. motors installed to operate the double-ended machines efficiently. The subject of rail corrugation is one in itself and is being investigated thoroughly by a committee of the A.E.R.A., which recognizes the seriousness of it fully. Therefore, I will merely summarize our practice with regard to corrugations, which if not removed will destroy the entire track structure and greatly increase car maintenance costs. Some years ago these corrugations were on the increase, but by expanding our grinding equipment we have caught up with the corrugations, removing them when they develop to a stage that warrants grinding. In the last three years we have removed approximately 160 miles of single-track corrugation, the average depth being 1/64 in. These heavy grinders are worked in sets of two or three, usually between temporary sliding crossovers placed a block or more apart, operating on two shifts, from 8 a.m. to 4:30 p.m., and from 8:30 p.m. until 5 a.m. When a street becomes corrugated we start at one end and work through by this method to the other end or as far as the corrugation extends. By speeding up the work in this way we reduce the interference with service to the public to a minimum and also do the work at a considerable saving in final cost.

Motor truck equipments for hauling materials and excavated materials have been increased rapidly and two years ago supplanted entirely the use of the slow and uneconomical teams and wagons on trackwork. Five-ton trucks are used for the heavy hauling, each equipped with a dump body. These trucks are also fitted with rail racks, so that in addition to other materials, rails can be hauled from the yard to the job. We also have some 4-ton trailers, used for hauling excavated materials, the trailers being placed on the job by the 5-ton trucks and later, when loaded, hauled away. Smaller trucks—1 to 3½-ton capacity—are used for lighter hauling. These trucks are also used for hauling the large air compressors, welding equipments, the use of the trucks being under the direct supervision of the track division superintendents.

For trackwork, electric boring and spike driving machines are used for the screw spikes which hold the rails to the ties. Hand work is done on only the smallest of jobs where there is insufficient work to warrant taking out the power equipments. Tie rod holes and fish plate holes, where required at cut-ins and special trackwork (these are normally drilled by the manufacturers) are made with Duntley track drills. One or more of these are in use on each division and at each of the frog shops.

We also have an asphalt road repair outfit, which is used to a great extent on maintenance work. During the winter this is used for heating concrete materials on small jobs and for special trackwork installations and at other times for heating asphalt for repairs alongside our right-of-way (we do not have much asphalt paving inside our tracks). Another use for this outfit is for heating natural rock asphalt that is being used to replace oak plank paving in crossings with steam railroads. Not only does this rock asphalt make a very considerable saving over oak plank, which in a railroad crossing usually lasts only from one to two years, but it gives a better paving and a safer one, as the danger of accidents is always present from loose or broken planks. This rock asphalt is easily laid and kept in repair and can be relaid when removed for crossing repairs. Plank pavings in grade crossings are being replaced by the natural rock asphalt on a slag foundation.

We also have larger power equipments, such as electric shovels, which are mounted on caterpillar tractors; a steam shovel, derrick or crane cars, supply cars, etc., which are used more or less for track maintenance, although primarily for construction work.

Use Manganese Coated Electrodes

The electric welding of special trackwork, particularly on manganese steel, has almost unlimited possibilities. We started the use of high manganese coated electrodes (11 per cent to 14 per cent manganese) in 1921 and have been uniformly successful from the start. Due to the nature of manganese steel it is necessary to treat the welds while still red hot with cold water. Care must be taken to see that the part to be welded is cleaned thoroughly and, in addition to frequent quenching, peening the weld with a small hammer to remove scale before proceeding. Welds are ground to a smooth surface with an Atlas or other grinder. We are also using a special grade of coated rod for welding high carbon on battered shop-built frogs and rail ends that has improved our results on such work. Manganese welding alone has increased the life of our special trackwork several years, some of the original 1921 welds still being in service. We are now using approximately 9 tons of high manganese electrodes a year and have not yet reached the limit for producing savings.

Wise Traffic Regulations Vital to Modern Communities*

By E. J. McIlraith
Staff Engineer Chicago Surface Lines, Chicago, Ill.

Regulation of the use of streets and highways, and not merely the regulation of vehicles, should be the interpretation of the term "traffic regulation" which should create the greatest advantage or usefulness for the streets to the community. This does not always mean the greatest advantage to any one class or the greatest freedom of movement for the majority of the vehicles. It means, rather, that the purpose for which the streets are necessary should be served in the most satisfactory way. It means a variety of answers suitable to the various times and places.

No Parking in Congested Areas

For instance, it is obvious that at least during rush hours busy thoroughfares, that are needed to capacity, should not be congested by parking or by slow service vehicles. It is also obvious that in a business district during most of the business day service vehicles must be able to load and unload express packages or make quick deliveries necessary to the conduct of business. However, it would be quite unreasonable for a warehouse or department store on the busiest streets to have trucks continuously loading or unloading at the curb so that the street and sidewalks would be largely or almost entirely blockaded by such use. In a warehouse district this might be perfectly acceptable.

The greater the tendency toward congestion the more restrictions must be placed to prevent certain practices or customs, thus creating restraint on individual liberty. Good traffic regulation keeps these restrictions appropriate to the time and place, and yet simple and understandable in application. The need for restriction on the rights of individuals to use the streets is perfectly evident and is acceptable as being basically in the interests of public policy.

There are good reasons why we are confronted with an ever-present threat of street congestion. Definite economic advantages to the country and to the individual citizens are clearly evident because of the concentration of certain kinds of business in large cities. Similarly, there are definite clearly established advantages created by the concentration of certain activities of a large city within a small central area. Likewise, there is good reason for the creation of secondary business centers, which concentrate in small areas here and there throughout a city. The theory of decentralization is only partially sound. Decentralization of some activities to small communities or to outlying sections of large cities can be justified, but the basic plan of one concentrated business center, and a large number of small secondary centers in city development, as is well typified in the city of Chicago, is fundamentally sound. It is not a mere happening or based on a false sense of values.

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*Abstract of paper presented before the Illinois Electric Railways Association, Springfield, Ill., March 17, 18, 1927.

Practically all cities are confronted with street systems that for the most part consist of streets of 80 ft. or less in width. With modern twenty-story to forty-story buildings, some of which house between 8,000 and 10,000 regular employees, this street system that was laid out primarily for four-story buildings must be used very intensively and wisely. The only limitation that needs to be placed upon the building heights in Chicago is the limit that still permits adequate light and ventilation. The problem of transportation and of accessibility can be solved at a cost that is reasonable, considering the values created by the need for such business concentration. Accessibility to a business district is what creates and maintains its value.

Individual Rights Give Way Before Community's Needs

Yet it is not necessary to permit each individual to use the streets leading to or in the busy district according to his own individual desires. The smaller the city the greater the liberty that can be granted to the individual to do what he chooses in making use of the streets. As the city grows the natural effect of the greater density of movement is to cause a larger percentage of citizens to see the folly of continuing, for example, to use their own private automobiles in going to and from business. Over 350,000 automobiles are registered in Chicago, and yet only about 90,000 vehicles cross the boundary line to the central district within a single day, although more than 800,000 persons enter this central district per day. It is not possible then to give the right of individual transportation to each person entering this district, neither is it necessary. Certain business vehicles must use the streets, public carriers are necessary to handle such large numbers, and street regulation should be so carefully developed as to provide the greatest possible speed and comfort for those using the public vehicles, who are the great majority, to those service vehicles necessary to the conduct of business and to as many private automobiles as can possibly be served by the street system existing.

It is not desirable to make the use of private automobiles impossible or difficult, but the greatest permissible freedom in the use of this highly appreciated modern convenience or luxury in American life should be one of the aims of traffic regulation.

The city of Chicago must provide subways and elevated railroads within the limit of its financial power, so as to create new street levels for the electric trains in order to leave the maximum of street space available for the other vehicles that must remain on the open streets. Since the streets cannot be widened horizontally in the central district and in many of the other busy areas, there must be an increase in capacity both by regulation of street use and by creating new levels on which the most effective carriers, namely, the electric trains, will operate.

Pending this development much can be done to improve on the existing usefulness of the streets, to increase speed, reduce costs of operation and to make more convenient all street use. Much has already been done in Chicago, as in other cities, such as regulation of parking in the rush hours, elimination of the left hand turns at the busier intersections, creation of through streets and boulevards for faster and freer operation, by installation of safety zones for street car passengers and by placing automatic signal control. Yet tremendous improvements may yet be made to increase the usefulness of the street system.

The creation of through streets and boulevards can make material improvements in the convenience of motor traffic, if laid out wisely and if rights of way are established equitably. Care should be taken, however, that traffic on important streets is not penalized unnecessarily or unfairly by being made to stop at a crossing with a through street or a boulevard, which at that particular intersection is serving a much less important purpose than the intersecting street. There has been a marked tendency everywhere to abuse the through street idea by creating through street or boulevard priority at points where such priority is harmful to the majority.

Many Factors Affect Traffic

Although much has been done in piecemeal fashion, more remains to be done, and the serious problems have not yet been answered. The recommendations of the Chicago Association of Commerce as embodied in the code written as a part of the McClintock report and presented to Council in December, 1926, are likely to be adopted soon. The principal value from this new code will be:

1. Simplification of existing regulations.
2. Authority given to eliminate parking when necessary on the busy streets. Parking will be abolished in the central area throughout the entire business day and may be abolished wherever necessary in business districts throughout the city, and on petitions from 75 per cent of the registered voters along any section of street may be eliminated on that section during hours asked for by the petition. This is done to protect residents from being overrun by patrons of theaters or other amusements in the neighborhood.
3. Establishing a time limit of twenty minutes for loading or unloading of delivery vehicles.
4. Eliminating the standing for loading or unloading with end of vehicle to the curb.
5. Control of mid-block turns.

The McClintock report did not make sufficient study of, nor definite recommendations covering, certain obvious practices, which are very serious factors in creating street congestion. Some of these are:

The use of the streets by building contractors.

(a) For storage of materials.

(b) For temporary sidewalks.

(c) For standing of trucks during unloading, loading or hoisting.

(d) The blocking off by ropes during hoisting of materials to the upper levels.

Elimination of slow moving vehicles from business streets.

Parking of taxicabs in taxicab stands.

Cruising of taxicabs.

Cruising by chauffeurs of private automobiles.

Street repair work, work on underground structures, or underground utilities during the business day.

Sprinkling or washing the streets during business periods.

Delivery or acceptance of passengers by taxicabs at places other than at the curb or within street intersections.

Location of bus loading zones.

Development of detour trucking routes around busy centers.

Delivery of merchandise and heavy materials outside of business hours.

Obstructions on sidewalks near street intersections such as hydrants, newsstands, postal boxes, rubbish boxes and light poles.

Each of these items might be discussed at length. Obviously each one represents a restriction that must some day be given attention in the interest of the greatest good to the greatest number.

It seems always difficult to get good police enforcement of traffic regulation. Police departments in this country are unfortunately forced to be responsive to political pressure. Perhaps part of their laxity is due to faulty judicial practices, and the importance that judges attach to the need for votes instead of to creating public respect for existing laws and regulations. Carelessness and deliberate evasion of responsibility by the enforcing agencies are creating a great public indifference. Many drivers are totally ignorant of the rules of the road, and seem to have no thought of ordinary courtesy to others when driving. Most of the accidents that occur on the streets and highways would be avoided if those using the streets would extend reasonable courtesy and consideration to each other.

Transportation Companies Should Lead Way

In developing better traffic regulation electric railway executives should take the most prominent part. Correct treatment of the traffic problem is of vital importance to the railway business and no other business has more at stake than the electric railways in developing safety and increased usefulness for the streets. It may seem to some that improving operating conditions for automobiles will be detrimental to the railway business, yet may we put it the other way. Unless operating conditions are improved on the streets used by electric railways the decrease in income to the railroad and the increase in expense of its operation will produce an impossible operating ratio. The railways cannot hope to prevent the competition of private automobiles and should not expect to gain business by increasing the discomforts of the users of private cars. If the railway service can be made attractive by adequate speed and reasonable freedom of movement, much more business will be attracted than if the cars are lost in street congestion.

Advantage to the railway operation is in these days of commission control of public utilities merely advantage to the car riders and the public officers can easily be made to understand that in arranging for improvements in street car operation they are arranging for advantages to all the individual citizens or voters whom they represent. The development of the spirit of fair play, a willingness to be helpful to all interests as well as skilled ability when solving the problems that interest and affect the community and active leadership in directing and developing public discussion or consideration of these problems should be considered obligations upon the railway management. Such activities present rare opportunities for creating public good will and for improving materially the street railway business.

The problems encountered cannot be attacked or answered by casual study. There is need for men thoroughly skilled in the principles underlying traffic regulation. Some one within the organization should be carefully trained, or competent outside assistance should be brought in to assist the management. Much nuisance prevails in methods of traffic control and in signal installation. Many serious mistakes are being perpetrated, and not everyone who claims to be advised is competent. Some of our largest cities have the most glaring defects in their traffic regulation methods, and many imitations of these plans are producing great inconvenience in the smaller cities that are accepting such plans without due attention to correct control principles.

Modernization of Cars*

By M. J. Oswald

Sales Representative, St. Louis Car Company

MUCH has been said and written recently about this subject, so there is bound to be repetition of considerable data which may sound familiar, which is due to the constant recurrence to this subject, whenever and wherever street railway men congregate, and is in itself another indication of the importance of this subject and the realization that modern cars are a dominant factor in the progress desired in successful street railway and interurban operation.

Looking at the situation from a cold-blooded business standpoint, the exhaustive survey made of twenty properties before and after modernization by the ELECTRIC RAILWAY JOURNAL shows that there is a reduction of 8 cents per car-mile in operating costs with 50 per cent modern cars. Before modernization the operating cost was 36.41 cents per car-mile and after 50 per cent modernization 28.29 cents per car-mile.

NEW CAR SAVINGS

In the case of five out of these twenty roads practically all cars were purchased new during recent years, and after the acquisition of the new cars the reduction shown is 16 cents per car-mile instead of 8; i. e., the average operating costs of these five roads prior to installing new cars was 39.56 cents and afterward 23.64 cents per car-mile.

Another interesting fact brought out by this survey was that on a different group of twenty properties with approximately the same total number of cars, the same range of sizes, the same total population served, the same mileage and about the same proportion of city and interuban service, practically no new equipment has been purchased during the past ten years. The average operating cost is 37.94 cents per car-mile, or practically the same (in fact about 1½ cents higher) as the different group of twenty referred to above before their equipment was modernized.

These above figures speak for themselves as to the financial betterment in the use of modern cars, and it is evident that the scrapping of obsolete cars is profitable; furthermore, from the additional data given below, taken from the same survey, it is apparent that new cars pay for themselves.

As previously indicated, the saving of a group having all modern light-weight equipment is about 16 cents per car-mile in comparison with operating costs on old equipment—it was also mentioned on a larger group having about 50 per cent modern cars was half of this amount. Similarly, the cost on a property having an average car age of ten years is taken to be about 8 cents per car-mile more than a road having all modern equipment. If excess operating costs between these two points are taken in proportion to age of equipment, the results would be in dollars, based on 82,450 cars comprising the entire industry, a total of $181,707,000, which is equivalent to 12,000 new cars at $15,000 each; to be ultra-conservative, cut these figures in half and it would still show operating losses on present equipment more than enough to pay for a greater number of new cars per year than have ever been inaugurated by the entire industry in any single year in the past twenty.

Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, in his article in connection with the compilation of these statistics, mentions "that there may be operating conditions on various properties that would make it impossible to obtain the average savings shown, but the conditions covered by the properties studied are sufficiently general to warrant most careful consideration by every operator."

Also, please bear in mind that no account whatever is taken or even estimated of the effect of improved modern cars on increasing revenue. Unless some fallacy can be shown in the figures presented—and we invite discussion on same by those operating members present—the conclusion reflected resolves itself into an axiom, namely, "That obsolete equipment costs far more to maintain than new equipment costs to buy."

Granting that the foregoing has demonstrated that the substitution of new cars for old at certain periods is not only an economical gesture but a necessary part of the program of a progressive and successful railway system, why not incorporate in the new cars all the features which are consistent with modern standards of living, and so popularize this mode of transportation that the appeal to ride in the electric car is so strong that it stands first in the minds of the public. Unfortunately, the attitude in many places at present is, "Well, I suppose I will have to take the street car, as there is no other way to go!"

MODERNIZED CARS NEEDED

An operating expert about a year and a half ago said: "One of the greatest needs of the traction lines today is the modernized cars to replace equipment which not only fails to attract business, but actually repels it in many instances." Based on such a statement, what a wonderful opportunity there is to so change and improve the antiquated street car and its accessories to counteract the last part of the above statement to the effect that it "actually repels business in many instances."

It has been said, and we have to admit it, that one of the most noticeable features of modern life is the gradual awakening in the last decade or two of the American people to the perfection of form resulting from the harmonious combination of diverse elements in unity.

Architecture shows a marked improvement; houses are better plumbed, but more often built with an eye to form and pleasing appearance; contrast the cupolas and ginger-bread gimcracks of a "mansion" of the early Grover Cleveland or Benjamin Harrison period, or the boxlike plainness of a less pretentious home of yesterday, with the Colonial, Spanish or English adaptation of the residential sections of today.

Interior decoration is also infinitely more colorful and artistic than yesterday. Even automobiles have improved quite as much in line and design as in power and upholstery. So-called "Beauty Shops" thrive and turn over millions of dollars yearly because women are eager to make their faces or figures attractive, and this is not confined to any particular class, but the patrons are from every walk of life. This is just another phase of popular taste; it is true that people long to have attractive and pleasing surroundings and will patronize and popularize the vehicle that plays up this appeal to their taste.

In selling city or interurban car rides we cannot overlook the fact that a transportation vehicle which was designed merely for "utility" in order to keep pace with the trend of the times must become a thing of beauty with pleasing lines, attractive painting, easy riding trucks, no unsightly equipment showing, particularly in the interior, comfortable seats, neat floor covering and modern lighting fixtures with plenty of illumination. Heating is another item that should be given careful consideration.

Plate glass throughout the car also adds much to the pleasing appearance and perhaps really would be the economical thing in the long run, provided, of course, that the replacement of ordinary glass is a considerable item of maintenance and could be substantially reduced by the substitution of the heavier and less fragile plate glass. On the regulation city car the cost of ⅛-in. plate glass, as far as I can determine, is about four times that of the ordinary glass now universally used.

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*Abstract of paper presented before the Illinois Electric Railways Association, Springfield, Ill., March 17, 18, 1927.

Mr. Gordon mentions in his article the Grand Rapids cars, which reflected a great many of the features mentioned above, and therefore it might be in order to mention the figures which are quoted below from *Electric Traction* of February, 1927, concerning the annual report of the above road, as follows: The gross earnings of the company increased $37,978 over 1925, while operating expenses decreased $45,170, largely due to the placing in service of the 27 new cars last June. In 1925 the company showed a deficit of $67,541 while for the year ended Dec. 31, 1926, a net income of $9,929 was shown.

You might also be interested in the following extract from Mr. DeLamarter's paper read at the C.E.R.A. convention at Toledo a few weeks ago: "During each month since the Grand Rapids rail coaches were placed in service the proportion of increase in passenger revenue on the three lines so equipped has been considerably higher than the increase shown on the balance of the lines. During seven months from June to December, 1926, passenger revenue increased 3.21 per cent over the corresponding period in 1925, while the passenger revenue for the same period on all other lines increased only 1.91 per cent."

HIGH-SPEED CARS SHOW RESULTS

By increasing the speed and installing modern cars a number of interurban railways, such as the Buffalo & Lake Erie, Pennsylvania-Ohio Electric, North Shore, Illinois Valley Division of the Illinois Traction System and numerous others have shown remarkable improvement as to increased revenue and popularizing the electric cars, and you all no doubt have had this called to your attention by various articles and figures that have been published.

It may be rather a broad statement, but personally I do not know of any city or interurban railway system in the United States that has not greatly improved its financial standing and public relations by replacing old equipment with new and modern cars. Furthermore, I heartily agree with these sentiments of City Manager Hopkins of Cleveland, Ohio, brought out in his address at the A.E.R.A. convention at Cleveland last year: "The American people are not an ungenerous or mean people. The American people, by and large, unless they are provoked or irritated or don't understand the situation, mean to pay anybody a fair return for anything he gives them."

Do not forget that the car is the "show window of the industry," and it has been demonstrated in merchandising that you must have an attractive show window in order to draw your customers inside. Incidentally, after he gets inside see to it that he is met by a courteous operator so that he will come again and tell his friends to patronize the electric railway line, and so popularize this method of transportation that it always stands first in the minds of the discriminating public of this progressive age.

Governor Fuller Decries Legislative Meddling

CAR riders are not getting a fair break because of the legislative burdens placed on transportation companies, according to Alvan T. Fuller, Governor of Massachusetts, speaking at the annual banquet of the New England Street Railway Club, held March 24 at the Copley Plaza Hotel, Boston. The cost of building subways should not be paid entirely by the car riders, he said, because subways are built for the convenience of other users of the street as well as for the railway passengers. Moreover, the extension of a subway into the new district benefits the property owners. He referred also to the construction of a new bridge, the cost of which must be paid in part by the Boston Elevated Railway. All persons other than the car riders will use this bridge free of cost. Why, he asked, should the car rider have to pay for what is provided without cost to the users of other vehicles? In the Governor's opinion the problem is one of educating the public to appreciate the rights of the car riders.

Adequate transportation facilities are a necessity, he said. What other industry is so essential, he asked, that public trustees would be appointed by the state to operate the property when it became involved in financial difficulties, as was done some years ago for the Boston Elevated Railway and Eastern Massachusetts Street Railway. That portion of the public which uses electric railways is unorganized and inarticulate. For that reason it does not always receive fair treatment. The opportunity to improve transportation is an inspiring opportunity for public service, the Governor said. A beginning should be made by striking off the shackles of unfair charges that legislation has heaped upon the car rider.

Street railways in New England have put their houses in order and have come to understand by experience that the public is willing to pay for good service, according to Fred Gordon, retiring president of the club. He said that the rate of fare is incidental, and cited the case of a man who does not hesitate to use a taxicab and tip the driver far more than the entire cost of a comparable car ride would be. R. B. Stearns, incoming president of the club, expressed his gratification at being chosen for this post, and assured the members that he would do his utmost to make the coming year a successful one for the club.

Other speakers at the banquet included Malcolm E. Nichols, Mayor of Boston; Benjamin F. Cleaves, former chairman Maine Public Utilities Commission, and Frank P. Sibley, special correspondent Boston *Daily Globe*. Edward Dana, general manager Boston Elevated Railway, officiated as toastmaster.

At a business meeting held in the afternoon new officers were elected. Those chosen were:

President, Robert B. Stearns, Boston, Mass.

Vice - presidents: Massachusetts, Howard F. Fritch, Boston; Connecticut, J. K. Punderford, New Haven; New Hampshire, John B. Crawford, Concord; Vermont, T. B. Jones, Burlington; Maine, Edward M. Graham, Bangor; Rhode Island, Walter C. Slade, Providence.

Secretary, John W. Belling, Boston, Mass.

Treasurer, Fred F. Stockwell, Cambridge, Mass.

Executive Committee: H. M. Steward, Boston, Mass; George E. Haggas, Portland, Me.; H. R. Whitney, Springfield, Mass.; C. B. Pierce, New Bedford, Mass.; H. S. Day, Boston, Mass.; E. W. Davis, Boston, Mass.; George Acker, Boston, Mass.

90,000 Vehicles in Chicago Loop

IN REPORTING Mr. McIlraith's discussion of traffic conditions, on page 579 of the March 26 issue, it was stated that 800,000 vehicles enter the Chicag Loop district in twelve hours. This should have read—"more than 800,000 people enter the Loop district in twelve hours." The statement that 90,000 automobiles enter the business district in twelve hours is correct.

American Association News

Power Transmission and Distribution

PROGRESS reports were considered at the second meeting of the power transmission and distribution committee of the Engineering Association held in Chicago, Ill., on March 8. There were present at this meeting the following: F. McVittie, chairman; C. H. Jones, sponsor; J. W. Allen, C. Bailey representing C. L. Hancock, M. J. Cooke, H. Casey representing G. Wennegal, J. H. Drew, Mr. Daiman representing W. H. Bassett, D. D. Ewing, S. S. Hertz, W. Heeley, A. J. Klatte, K. J. Keith, J. Leisenring, H. S. Murphy, J. F. Neild, W. J. Quinn, M. B. Rosevear, D. L. Smith, A. Schlessinger, W. Schaake and R. D. Wade.

R. H. Rice, board of supervising engineers, Chicago, and C. Smith, Chicago Rapid Transit Company, were guests.

The chairman requested suggestions of subjects to be considered next year. The following three subjects were submitted: (1) Economics of electric track switches; (2) use of braking devices on reels, in stringing trolley wire; (3) reclamation of corroded steel poles.

The distribution representative on the special committee on current collecting devices requested the members of the power distribution committee to give freely any information on this subject which might be asked of them, since the subject was considered to be of considerable importance.

Each of the sub-committees presented a progress report. Sub-committee No. 3 on trolley wire wear will carry on the study of trolley wire breaks and will prepare data which will supplement that published in last year and in previous years. Sub-committee No. 4 on specifications for high-strength trolley wire showed that negotiations with the American Society for Testing

Materials were being continued and that a compromise on the points of issue in connection with this specification was very probable. Sub-committee No. 5 on radio interference stated that more study should be given to the previous reports on this subject by those experiencing this difficulty. The subcommittee investigating the possibility of establishing a standard by which various methods of operating and maintaining overhead lines may be compared has drawn up forms for collecting the necessary information. These forms will be filled in by the members of the committee and will then be summarized for discussion at the next meeting. The standardization of trolley reels has advanced to the point of a tentative size grouping of these preliminary dimensions and will be submitted to manufacturers and users of trolley reels for criticism before any attempt at standardization is made.

The next meeting will be held in New York on June 16 and 17.

Unification of Car Design

Engineering Association Committee Presents Progress Report for the Information of the Industry

WHEN the committee on unification of car design of the Engineering Association was appointed last fall one of the subjects assigned was to follow through the work begun last year by the committee on essential features of modern cars of the American Association. This latter committee made a report at the 1926 convention giving the requirements of present-day car designs, which was abstracted in ELECTRIC RAILWAY JOURNAL for June 26, 1926, page 1086.

The committee on unification of car design has now submitted a progress report, an abstract of which appears below:

In replies from member companies commenting on the report of the committee on essential features of modern cars, there seemed to be some question as to whether particular problems could be met by the recommendations contained in the report of the committee on essential features of modern cars. It was decided, after discussion, that the committee on unification of car design, acting through the secretary of the association, would be glad to take up for analysis the different problems of any of the operators that care to submit them, and will assist to the best of their ability in arriving at a solution of the problems that may arise as to car designs and necessary equipment details in connection therewith.

The car designs submitted were arrived at after careful study of a weighted average of representative cars that have been in successful operation throughout the country. The designs cover fundamental dimensions that are of the utmost importance to the car builder, if he is to place the building of cars on a production basis. No attempt has been made to present a completely designed car that would be adaptable to all properties. The details covered, however, are adaptable to practically all properties, subject to some few modifications in special cars, where physical limitations require changes. It is recommended that member companies contemplating the purchase of new cars give careful study to the 1926 report of the committee on essential features of modern cars before a definite decision is made.

By using these fundamental recommendations, with supplemental detail to meet the individual properties' requirements, the builders will be able to reduce materially their engineering and special equipment requirements, group their production operations, and thus facilitate the building of equipment, with its attendant lowering of costs. Any saving thus obtained by the builder is of twofold advantage to the user—a lowering of first cost and an earlier delivery of equipment. It is also a step toward standardization of equipment, which embodies the best features from not one but a large number of operating properties.

WHY SOME COMPANIES DID NOT FOLLOW COMMITTEE'S RECOMMENDATIONS

As a result of the committee's discussion a number of points were brought out as to the reasons why some companies adopted, and others did not adopt, the recommendations of the committee. In one case, a company made an earnest attempt to follow out completely the recommendations of the committee on the fundamental dimensions and weights. This company submitted its plans and specifications to the association, asking that they be compared with the recommendations made in the 1926 report. In various instances the design and dimensions submitted differed from the recommendations, as a result of which several conferences were held with officials of the company, to see if the design could be modified to embody all of the committee's recommendations. This was at first believed impossible, due to the peculiar character of the service, which was a combined city and interurban service, and due also to rather limited clearances on curves.

Following these conferences, this company made a careful analysis of the design and shortly after was able to modify it so that the car body between corner posts in every way met the committee's recommendations as to the design of interurban car. Since this car operated through a number of small communities, where operating conditions require rapid loading and unloading of passengers, it was considered advisable to adopt a platform design substantially the same as that recommended by the committee for city cars.

The result of all this is that the company now has a car that can be said to meet with the committee's recommendations and that is in every way satisfactory to the operating company, although at first it was not believed that this was possible.

Another instance was discussed wherein an operator of one of the small properties was in the market for a few cars. Considerable time and money had been spent in preparation of specifications for a car that was considered necessary for the individual conditions. The specifications, however, as prepared, were not sufficiently different in the salient features to preclude the adoption of the recommended A.E.R.A. car. The car builders, therefore, offered this company cars of the dimensions and arrangement recommended by the committee for general use, at a saving of from 15 to 20 per cent in cost, due to the possibility of using existing engineering data, drawings and templates. The operating company, however, after much consideration, decided to purchase cars in accordance with its original specifications, and forego the saving in investment and the possibility of securing the cars at an earlier date.

This illustrates a case where a small company could have obtained every desirable feature of style and furnishing which was considered necessary to make the cars attractive in appearance, and at the same time comfortable and convenient for the patrons, at a material reduction in cost. The manufacturer, at the same time, was willing to guarantee that this car, built in accordance with the recommendations of the 1926 committee, would be at least equal in attractiveness to the customer's own design, and was entirely willing to guarantee every feature of the construction. This is one example where individual tastes are working as a detriment to the activities of the association as a whole, in its endeavor to bring about conditions which will tend to lower the cost of cars.

The committee has the assurance of the car builders in general that they are willing to proceed with the manufacture of cars built in conformity with the designs recommended by it. It believes that if the member companies will use cars built in conformity with these general recommendations a definite saving will be made in the cost of cars. The car builders have pointed out that the cost of engineering alone, for a group of cars, runs on the average anywhere from $1,500 to $2,000. In the purchasing of cars as covered by the committee's recommendation, this cost of engineering would be materially reduced. This cost alone, for a lot of ten cars, amounts to $150 to $200 a car. The time of delivery, also a very great factor with cars of special design, will be shorter for cars built in conformity with the recommendations of the committee.

In order that some definite designation be given to the types of cars as covered by the 1926 report of the committee on essential features of modern cars, it was decided, after discussion, to recommend that the designs for the city cars be known as "A.E.R.A. City Car Design" and that the designs for the interurban cars be known as "A.E.R.A. Interurban Car Design."

The report was signed by J. A. Brooks, C. A. Burleson, W. J. Clardy, L. J. Davis, C. Gordon, J. W. Hulme, G. L. Kippenberger, J. Lindall, V. Willoughby, A. P. Jenks, A. L. Kasemeter and H. H. Adams, chairman.

The News of the Industry

New Lines Suggested for Boston "L"

Legislative Committee Suggests Construction of Tunnels—Termination of Public Control Debated

A new rapid transit extension plan has been adopted by the committees on metropolitan affairs and street railways of the Massachusetts Legislature for new lines to be built on the Boston Elevated Railway system. This bill, which has been reported in the Senate, provides for carrying out the plans for rapid transit extensions which the Legislature two years ago directed the planning board to study and report upon. The bill calls for the construction and operation of two rapid transit lines through the center of Boston, one of the lines starting at North Cambridge, extending through Somerville to Lechmere Square, and thence utilizing the existing viaduct to the North station, the Tremont Street subway to the present terminus of that subway at Broadway and Tremont Street, thence by new construction to a point near the corner of Huntington Avenue, and Tremont Street, Roxbury, with stations near the Back Bay station, West Newton Street, Massachusetts Avenue and the Opera House.

Five Years to Complete

The other line provides for an extension of the East Boston tunnel in East Boston, and starting from the terminus of that extension trains would run through the East Boston tunnel and a new tunnel connecting with the westerly tracks of the Tremont Street subway at Park Street, thence to Boylston Street, and through the Boylston Street subway to Governor's Square, and by new construction under Governor's Square, and out Commonwealth Avenue, to Harvard Avenue or some terminal beyond. The present plans of the planning division are that the extension in East Boston would connect with the Revere Beach & Lynn at the Wood Island station. It is estimated that it will require five years to complete the construction of these two new rapid transit lines. No new rapid transit extensions have been made, with the exception of the Shawmut branch, since the opening of the Cambridge subway in 1912. It is true, however, that the short extension from Sullivan Square to Everett was opened in 1919, but this extension was of minor importance; were it not for the development of the automobile during the past ten years the present transportation system would have long since been totally inadequate.

This bill ties up somewhat with the other Elevated bill for the 25 year extension of public control, because the financing of the extensions is provided for in that public control bill.

Strong opposition is developing to the public control bill. A substantial minority from the metropolitan affairs and street railway committees has decided to urge termination of public control and the return of the Elevated to its stockholders. It has filed a bill to that effect, to give the Elevated notice of the return to private ownership by July, 1929. A legislative hearing on this general subject was given on March 29, and it was expected that the Elevated stockholders, directors and trustees would express themselves regarding the plan for a 25-year extension of public control. But these three groups remained silent, except for one small stockholder who told the legislative committees that he did not care whether the Elevated property were returned, or the public control extended; he said that the stockholders can run the property now if it is given back to them without any stranglehold from the Legislature.

Mayor Signs Amended Parking Ordinance for Philadelphia

The amended parking ordinance providing one-hour parking on Broad, Market, Arch and several other central city streets of Philadelphia, Pa., became a law when Mayor Kendrick signed the measure on March 28. Comment on the change in the parking regulations was made in the ELECTRIC RAILWAY JOURNAL in the issue of March 26, page 560.

Passage of the amendatory ordinance came as the result of organized opposition by central city business men to the drastic measure which banned parking in a large downtown area. The new law limits the affected area to the district bounded by Vine and Pine Streets and Delaware Avenue and 23d Street.

Under the terms of the ordinance no parking is allowed within 100 ft. of any street intersection where a trolley-loading platform or safety zone is established, and 40 ft. from any other street intersection; no parking is allowed at any time on any street less than 20 ft. wide for a period longer than necessary to load or unload in the restricted area; no parking is permitted anywhere in the city between 3 a.m. and 6:30 a.m.

Proposed Change in New Jersey Fares Suspended

Further suspension was directed by the Board of Public Utility Commissioners of New Jersey on March 26 of proposed changes of fare zones by the Public Service Railway and the Public Service Transportation Company. The new rates were to have become effective on Jan. 1, but the board suspended the change until April 1. The further suspension will be for a period not exceeding three months from April 1, unless the board disposes of the case sooner.

United Suburban Railway Takes Form

New Lease on Life for Michigan Company Celebrated at Enthusiastic Meeting—All Grandville There

In Grandville, Mich., one of the smallest villages in the state, the shortest interurban railway with the longest list of stockholders in the United States was born recently when the United Suburban Railway came into being. The new company will take over and operate the defunct Grand Rapids, Holland & Chicago Interurban line between Grand Rapids and Jenison, a distance of 8.3 miles. Representatives of 700 families along the railroad, all stockholders of the company, and six Grand Rapids bankers and business men attended the birthday party when organization of the company was completed, by-laws adopted, directors elected, contract of purchase ratified and $7,000 additional stock subscribed to bring the total subscriptions up to $50,600, the amount required to close the deal.

Drive for Sufficient Funds

By a peculiar circumstance the Rev. J. P. Battema, pastor of the Wyoming Park Christian Reformed Church, was chosen temporary chairman of the meeting. It was he as a minister who spoke the last words over the old line when it quit business last November and it was he at this meeting who spoke the first words over the new line. The six Grand Rapids bankers and business men, Dudley E. Waters, president of the Grand Rapids National Bank; Gilbert L. Daane, president of the Grand Rapids Savings Bank; Benjamin S. Hanchett, one of the promoters of the original Grand Rapids, Holland & Lake Michigan Railway; Arthur E. Wells, Eugene Richards and Harold M. Braudy, the latter being purchasing agent of the defunct line, injected pep and enthusiasm into the meeting. Their efforts brought the drive for sufficient funds to a successful culmination. They were among the first to subscribe for ten shares of stock when the call for additional shares was issued, increasing their bids to fifteen shares to insure the quota.

Harold T. Slaght, cashier of the Grandville State Bank, who has been the prime mover and guiding spirit in the rejuvenation of the road, was elected director-at-large. Other directors elected from a field of twenty candidates from the different communities to be served by the line are: A. Dick and William Huizenga of Galewood, Paul Gezon of Wyoming Park, E. F. McCarrick of Hamilton and Edward Miller and Gerritt Zuidema of Grandville. Officers will be elected later.

Conditions of the contract of purchase as ratified call for the payment of $30,000 for the old railroad. The Consumers Power Company, the owner, has offered to lease the right-of-way to the new railroad at an annual rental of $1,000 plus taxes, while the Michigan Railway has offered the use of its tracks from Grandville Avenue junction, at the southwestern limits of the city, to its terminal in the heart of Grand Rapids, for 20 cents a car-mile and a terminal charge of $4,500 a year.

During the meeting Y. Groendyke, chairman of the nominating committee, termed the project as "a railroad owned by the people, operated by the people and patronized by the people." He said if the line fails to pay it will be because the people of Wyoming township have a grudge against themselves.

Wages on Interborough Advanced 5 Per Cent

A 5 per cent increase in pay for its employees who are members of the Brotherhood of Interborough Rapid Transit Company Employees was announced on March 29 by the Interborough Rapid Transit Company, New York, to be effective on April 1. This means an extra annual expenditure by the company of approximately $1,500,000. The advance will affect nearly 15,000 employees, members of the operating, mechanical and clerical departments.

The announcement was made by Frank Hedley, president of the company, following action by the board of directors at which Mr. Hedley read a letter from M. J. Mangan, secretary of the brotherhood, requesting the increase, and suggesting a two-year contract with the brotherhood at the increased rate. This contract will be drawn up and signed shortly. A statement by Mr. Hedley said:

> By this increase the company makes the second of the 5 per cent readjustments in pay following the voluntary reduction of 10 per cent to which the employees agreed in 1921 as their contribution to the plan to keep the Interborough out of receivership. The first 5 per cent was restored in 1923 and the second at this time. This is in accordance with the company's pledge that wages would be raised just as soon as finances permitted.
>
> The Interborough is able to grant this increase, which amounts to approximately $1,500,000 a year, by the utmost economy in other directions and by the most careful management of every department. For a long time we have all realized that these employees should have more money and our aims and hopes in this direction are now achieved to the very limit of our financial ability. Every cent which might be utilized for this purpose is absorbed by the new agreement.

At present motormen receive 82 cents an hour and guards 54⅜ cents as the top rate or $4.37 for a day of eight hours.

New Suggestions Offered on Rainier Project

Requests that it be permitted to have a monopoly of transportation in the district which it serves and no longer be required to pay the city a franchise tax featured proposals made to the Seattle, Wash., City Council recently by the Seattle & Rainier Valley Railway, through M. E. Samsell of Chicago, its president. The conference was secret and the only statement was that of E. L. Blaine, finance chairman and official spokesman for the Council.

Plans to have the city take over the railway on a leasing arrangement were discarded as impractical.

Through Service Between Chicago and Central Illinois Awaited

With the completion about May 1 of a short stretch of connecting track in the city of Joliet, Ill., through interurban railway service will be established for the first time between Chicago and central Illinois valley points, according to a statement issued March 21 by J. R. Blackhall, vice-president of the Chicago & Joliet Electric Railway. A joint operating agreement recently consummated by the Chicago & Joliet line and the Valley division of the Illinois Traction System calls for the operation of the latter's cars from the Chicago terminal of the Chicago & Joliet at Archer Avenue, by way of Joliet, Morris and Ottawa through to Princeton, Ill., a distance of more than 110 miles. From Chicago to Joliet the cars would use the tracks of the Chicago & Joliet line and the Illinois Traction System rails from Joliet westward. Tentative plans provide for four round trips daily, two in the morning and two in the afternoon and evening.

The Illinois Traction system's popular new "Tangerine" light-weight, one-man interurban cars will be operated in this service, stopping only at the larger towns and providing "limited" service over the Illinois Valley division for the first time.

Although the project was approved by both companies last December, actual construction work, which will be undertaken by the Chicago & Joliet line, has been delayed for several months due to the municipal primary election on April 19, Mr. Blackhall explained. He added, however, that permission to make the physical connection between the two lines would undoubtedly be granted by the city commissioners immediately after the election and that he hoped service could be started by May 1. All materials for the work are now on hand.

Power Cost Condition in Seattle Not Obligatory for Deal

Negotiations between the city of Seattle and the Puget Sound Power & Light Company for a reduction in the annual payments on the purchase of the Seattle Municipal Street Railway have advanced a step further with the assurance by A. W. Leonard that he will not insist on a ½-cent rate for power furnished by the city lighting department to the railway for its operation. In the power company's offer to the city for an extension of time on the purchase bonds, Mr. Leonard had imposed a condition that the present rate charged for electric railway power be lowered to ½ cent, but he now states that if this means that the city light department would be supplying the power at less than cost of production, he will not insist upon this condition.

The present rate charged is 1 cent a kilowatt-hour. City officials have tentatively agreed upon a ¾-cent rate. This they plan to suggest to Mr. Leonard, and it is understood that the latter will be satisfied with this rate if he is convinced that the city cannot furnish the power at a cheaper rate without loss. Meantime a report on production costs is being prepared by the lighting department, upon which the Council will decide a rate to be submitted for further dealing with the Puget Sound company.

The litigation involving the railway pending in the federal court is no nearer settlement than it was weeks ago. Various delays have continued the hearings from time to time. The only litigation in which the city is involved now is the Von Herberg suit, which seeks an order restraining the city from paying any further money on bond redemption and interest until all labor and operating costs have been met.

Fare Petition Formally Presented in Macon

The formal petition of the Macon Railway & Light Company, Macon, Ga., for increased fare, rerouting of lines and other concessions was presented to the City Council on March 15 and referred to the public utilities committee. The company wants a 10-cent cash fare with three tickets for 25 cents: lifting of paving assessments and gross receipts tax; permission to change schedules and to reroute nearly every line. In return it proposes to rehabilitate the entire system, building new track and sidings, buying ten new cars, and spending in all a total of $314,000. The present fare is 7 cents.

Transit Matters in Philadelphia Passed Upon by Commission

The Public Service Commission of Pennsylvania on March 29 rejected the proposed new lease of the Frankford Elevated to the Philadelphia Rapid Transit Company and approved the Chestnut Street subway agreement with the city. The latter provides for construction of a surface car subway by the municipality to be leased to the transit company until such time as rental payments equal cost of construction, when title will pass to the Philadelphia Rapid Transit Company. Consent of commission to Frankford "L" lease was withheld because of conviction that no lease for that line should be signed which does not include provision for rental to the transit company of the Broad Street subway.

Ordinance Against One-Man Cars in Buffalo Overruled

The city ordinance at Buffalo, N. Y., which makes it unlawful for the operator of a street car to engage in the performance of any other duty while the car is in motion, aimed primarily against one-man cars in operation by the International Railway, is unconstitutional. City Court Judge Peter Maul so ruled in a decision handed down in a test case when the police department arrested an operator of a one-man car in an action to recover $50 penalty for violating the new rule.

Judge Maul cited the opinions of higher courts upholding the regulatory authority of the Public Service Commission with respect to the railway and held that the city is without authority to legislate against one-man car operation. The city's case was dismissed.

Paving Measure Passes in Utah

House bill No. 120, recently passed by the Utah Legislature and signed by Governor Dern, provides that every electric railway in Utah shall, at its own expense, restore the pavement, including foundation thereof, of every street disturbed by it in the construction, reconstruction, removal or repair of its tracks, in the same condition as before the disturbance thereof, to the satisfaction of the Board of City Commissioners or City Council having charge of such street. The obligation imposed by this act shall, in cites of the state of Utah, other than cities of the first class, be in lieu and substitution of any and all other obligations of any such company to pave, repave or repair any street, or to pay any part of the cost thereof.

When any street of any city, other than cities of the first class, occupied by the tracks of the railway is to be paved or repaved, the Board of City Commissioners, or the Mayor, and City Council of said city is vested with authority to assess the entire cost of paving or repaving such street, including the portion occupied by said tracks, against the abutting property.

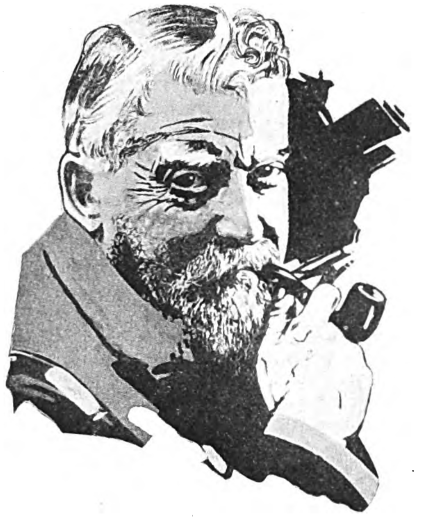
Railway in Saginaw Oil Boom Area

Oil has been struck in Saginaw, Mich. As a result that city has taken on the appearance of a new El Dorado. And the discovery doesn't seem to be a flash in the pan, either. Many of the big companies have begun operating. The Sun Oil Company is on the ground, so is the Ohio Oil and a host of others. So is the Saginaw Transit Company, for some of its property is believed to be in the "strike" area. It is too early to attempt to predict to what extent the railway and bus company will become an oil producer, but its management doesn't propose to miss any bets.

Every acre included in the present field, which extends 2½ miles northwest of the Saginaw business district and is 1½ miles wide, is under lease to the pioneer companies. There is a derrick within a block and a half of the city's largest office building. The flow is there, but there are no gushers. After the initial tumult and shouting has died, a sane appraisal of the prospects will be in order. Then will the transit company know to just what extent it will be a participant in an oil boom that for the present at least has set the whole city topsyturvy.

Houston Company Educates Riding Public

The Houston Electric Company, Houston, Tex., is running a series of newspaper advertisements in its campaign to educate the riding public to the need for an increased fare. One advertisement, entitled "The Future of Public Transportation—Street Cars vs. Buses," stated that the new schedule of rates proposed would provide a lower rate for the constant user and a somewhat higher rate for the infrequent user. The company's fare petition was digested in the JOURNAL recently.



"Will Livelong"

"Will Livelong" in Philadelphia—Make April Safe

Municipal authorities of Philadelphia, Pa., have viséd the passport of "Will Livelong," the safety sage, who as the guest of the Philadelphia Rapid Transit Company will spend the month of April in the Quaker City with the promise to augment the happiness of Philadelphians by reducing the accident hazards of the streets. This kindly, wise old gentleman will be on hand, if not in person at least in picture, to caution children not to play in busy streets; to advise pedestrians to have a care when inclined to indulge in the dangerous practice of jay-walking, and to urge motorists to think for the other fellow as well as for themselves.

Behind this safety campaign are lined up a great many aggressive factors in the community life, including such organizations as the citizens' safety committee of the Chamber of Commerce, the public and parochial schools, the Automobile Club of Philadelphia, the Keystone Automobile Club, the Safety Patrol, the Boy Scouts and Girl Scouts. All other organizations in the city are being asked to lend their active support to the campaign and to contribute to its success by urging the idea and practice of safety upon their members.

A special safety Sunday will be set aside later in the month, at which time the various churches and religious organizations of the city will be asked to co-operate by emphasizing the importance of street safety and by discussing ways and means of reducing the accident hazard.

Each week of April will be devoted to special phases of the campaign. The first week, from April 3 to 9 inclusive, will be devoted to accidents involving children. This phase of the activity is advanced in an effort to reduce the 134 fatal accidents and 4,284 non-fatal accidents involving Philadelphia children during 1926. Later in the month will come periods devoted to pedestrian accidents and automobile accidents.

Headquarters of the "Will Livelong" safety campaign are located on the thirteenth floor of the Hotel Touraine, 1520 Spruce Street.

Subway Proposed in Fulton Street, Brooklyn

The route and plan for a subway in Fulton Street, Brooklyn, N. Y., was adopted on March 31 by the Board of Transportation, which sent a resolution to that effect to the Board of Estimate for approval. The plan calls for a four-track subway which will be the main trunk line of the city's new subway system in Brooklyn. It is expected that the new subway, which is to be constructed from Lafayette Avenue to Alabama Avenue, will hasten the removal of most of the elevated railroad in Fulton Street.

Another resolution was adopted by the board directing Robert Ridgway, chief engineer, to report on the cost of extending the Fulton Street subway from Alabama Avenue to the county line between Kings and Queens and to study the availability of other lines for this extension. A report was also requested on the best method of transfer connection with the Atlantic Avenue division of the Long Island Railroad and best methods of eliminating grade crossings over the railroad tracks.

One-Man Cars on Barberton Run

One-man car operation has become effective on the Barberton-Wadsworth line of the Northern Ohio Power & Light Company. The change is made for two reasons—safety and economy. More than a year of one-man operation in Akron has demonstrated the value of one-man car operation from the standpoint of safety and the company believes that as soon as the public becomes accustomed to the change it will fully approve the move.

The pay-enter plan has been adopted and passengers will board and leave cars at the front. The center exit will not be used. Zone checks are being used. Passengers boarding cars westbound in Akron will not pay as they board the cars, but pay as they leave. Eastbound passengers boarding cars between Wadsworth and Sherman will also pay as they leave. Passengers in the other zones pay as they board cars and secure a check showing destination to which fare is paid.

Thank You Aids in New Brighton

Think you, "thank you" deserves no praise?
It may not directly get you a raise
But it does spread cheer
So at the end of the year
You'll have no fear
But lots of good will, piled up for you, Bill,
And a great big THANK YOU—
from the Beaver Valley Board.

Have you heard a thank you? Jot it down. It's contagious with the Beaver Valley Traction men. Each man in the company is a thank you scout, and when he hears a fellow worker praised by a patron for some little kindness or courteous act he takes this as his clue, writes it down in his notebook and at the end of the day transmits it to some member of the board—the dispatcher, superintendent, commercial manager or even the general manager, himself—who passes it on to the original man.

This is the gist of the latest bulletin of C. D. Smith, general manager.

Unusual Publicity Campaign in Grand Rapids

In the campaign literature used by the Grand Rapids Railway, Grand Rapids, Mich., in connection with the paving referendum submitted to the voters at the March 7 primary four stunts were especially interesting and served as evidence of the efforts of the company to win approval to its idea of relief from the cost of paving between the tracks. The measure, which was lost by a vote of 3,375 for and 4,612 against, was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 26, page 586.

A convincing piece of publicity literature was a bulletin sent out with a letter from the secretary of the Chamber of Commerce to all members of that organization and to factory employees. Factory owners used the material for tack-ups near the time clocks in their shops. The bulletin read that a "yes" vote had been unanimously approved and indorsed by the Grand Rapids Civic Round Table. Another idea was the distribution to the railway organization of pledge cards to help get out the vote. It was called "Votes I Can Secure." Another device was the slip-in connection with the employees' pay checks. On this paper nine results of a "yes" vote were listed. A departure from the usual form of advertising was the issuance of cards by all drivers of the Yellow Cab Company of Grand Rapids in helping the railway in its campaign. The message of the Yellow Cab Company recognized the Grand Rapids Railway as a competitor, but was "happy to co-operate with any movement or enterprise that will help Grand Rapids progress." Invisibly written on the card was the name of Bert Kenyon, manager of the Yellow Cab Company, who apparently believes that working with Mr. DeLamarter means the growth of his city.

News Notes

Would Suffer the Little Children.—A reduction in fare from 7 cents to 5 cents for children under 15 years of age was authorized on March 25 on the lines of the Johnson City Traction Company, Johnson City, Tenn., by the State Railroad & Public Utilities Commission. The commission also authorized the company to issue weekly passes to sell for $1.25 and allowed the sale of fifteen tickets for $1. The Johnson City Traction Company recently raised fares by the consent of the commission and discovered that it lost the business of the school children, who walked rather than pay 7 cents. It is with the desire of restoring the patronage of the children that the fare has been reduced.

Would Abandon Franchise Rights.—The Key System Transit Company has applied to the California Railroad Commission for authority to abandon its franchise rights on East Sixteenth Street between Second Avenue and Fourteenth Avenue in the city of Oakland and for a certificate declaring public convenience and necessity require construction and operation of a connection between applicant's Eighteenth Street line and its East Sixteenth Street line on and along Fourteenth Avenue. The railway sets forth that the city of Oakland proposes to pave East Sixteenth Street, throwing an expense of $88,000 on it, which is not warranted by the traffic on the lines.

New Caps and Badges in Kansas City.—The old style caps and badges worn by transportation employees of the Kansas City Railway, Kansas City, Mo., were replaced on Feb. 1 by new headgear similar in design to that worn by motor coach operators. The new caps are blue and have a larger and more loosely fitting crown. The badges of the new Kansas City Public Service Company are also of a different design. The expense of the new equipment was borne by the company.

Talks on Safety to Students.—Safety talks will be given to the school children of Atlanta, Ga., by a selected group of trainmen of the Georgia Power Company. Under plans outlined by Safety Director W. J. Rountree and H. Reid Hunter, assistant superintendent of the Atlanta public schools, every school will be visited. All addresses will be centered about three major points—conduct in street cars, on streets and hazards of bicycle riding.

Hearing Held on Oneida Fares.—Commissioner Van Voorhis held a hearing on March 25 on the application of the New York State Railways to the Public Service Commission for permission to increase fares from 7 to 10 cents, with three tickets for 25 cents, in the Oneida district between Sherill and Wampsville. Corporation Counsel Scoville, representing Oneida, withdrew opposition to the increase in fare on the stipulation by the railway to give a 30-day commutation ticket from Oneida to Wampsville for $2.50 for 50 rides; a round-trip ticket for 15 cents between Oneida and Wampsville, and to continue the sale of the workmen's tickets as at present at 11 cents.

Another Store Gives Free Rides.—The Reps store of Springfield, Mo., recently held a sale and provided free transportation on the local cars of the Springfield Traction Company between the hours of 9 and 10 o'clock on a Monday morning. As a result of this enterprise, coupled with judicious advertising, the store broke all records for sales during 28 years of business. The store's advertising for that sale day covered ten full pages in the Springfield *Daily News*, Sunday issue.

Amended Fare Order in Syracuse.—The Public Service Commission amended its order of Feb. 2, 1927, on March 24, in reference to fares on the Syracuse line of the New York State Railways by permitting the railway to sell six tickets for 45 cents on its cars and to establish at least fifteen stations in Syracuse where tickets or tokens will be on sale at the rate of four tickets or tokens for 30 cents, provided these stations can be established without expense to the company. This amended order is to become effective on April 1 and to remain in effect for 60 days thereafter or until otherwise ordered by the commission.

Cars Carry Falls Illumination Display.—A large display sign calling attention to the nightly illumination of Niagara Falls, N. Y., was carried in more than 700 city and interurban cars of the International Railway, Buffalo, on March 28. The sign, centrally located in the interior of the cars, shows a night view of the American Falls at Prospect Point, together with the announcement of the time of the illumination. The wide display on all cars with the suggested beauty of the falls at night is expected to stimulate travel to Niagara Falls.

Pamphlet on Railways Distributed.—"He profits most who serves best" is peculiarly applicable to an electric railway and finds its exemplification in the history of every successful street railway. This statement was made the conclusion of a paper read before the Memphis Engineers Club on March 7 by A. D. McWhorter, general superintendent of the Memphis Street Railway, and copied for distribution in pamphlet form with the compliments of the Memphis Street Railway. In some 20-odd pages Mr. McWhorter traces the history of street railways as a factor in transportation and gives some details on the Memphis system. Comment from the *Daily Post*, *Daily Argus* and the *Public Ledger* of May 30, 1866, on the inception of railway operation is reproduced.

Employee's Right Upheld.—The Indiana Public Service Commission on March 18 overruled a motion filed earlier in the week by attorneys for the Indianapolis Street Railway to dismiss the petition of James Green, an employee, that the commission act as a board of arbitration to effect a new wage scale agreement. Mr. Green filed a petition for redress of grievances as provided in a working agreement he said he signed with the company. Attorneys for the company then filed a motion to dismiss the petition, contending that his move was not made in good faith as he represented no one but himself and that the commission had no jurisdiction. The order issued March 18 said in part that "the contract under which this proceeding was instituted was, among other things, for the purpose of guaranteeing to the employees of the respondent signing the contract an effectual and constantly available remedy to adjudicate all controversies which may at any time arise." No date was set for hearing the employee's petition.

Foreign News

Automatic Substations for Cape Town Suburban Railway

When the electrification now in progress on the Cape Town Suburban Railway is completed it will be the first line in South Africa to have all its substation equipment automatically operated and remote-controlled. The line runs from Cape Town to Simonstown, a distance of about 30 miles. It will have six substations, each of which will contain one or more pairs of

1,000-kw. rotary converters by which three-phase current at 33,000 or 12,000 volts from the Salt River power station will be converted to 1,500 volts direct current for operation. The load dispatcher at the central station will be able to start or stop the rotary converters at any of the substations and will be assured by means of visual indications that the machines have done what he wishes and are working properly. For this purpose the all-relay tandem supervisory system of power control of the General Electric Company of England has been adopted. The twelve pairs of rotary converter sets, with automatic starting equipment, high-speed circuit breakers, etc., are being made at the company's Witton Engineering Works, Birmingham. Supervisory control equipment, really a telephone engineering job, is being supplied by the Peel Connor Telephone Works, Coventry.

Lack of Funds Halts French Electrification Program

Electrification of the seven regions in France as outlined in the rather extensive program which started at the conclusion of the World War has been halted because of lack of funds. Unison of these lines began to show progress two years ago, because the regions lying closest to the Alps and Pyrenees having the most available water power were developed first. Five or six years is the length of time to erect hydraulic-electric generating stations. For this reason the cost of construction is enormous, since long-term loans have risen in cost from 5 per cent to 13 and 14 per cent. Several proposals for construction of the program have been made, but the only reasonable solution seems to be the stabilization of the franc, according to industrial authorities.

Success of 2d. Maximum Fares in Glasgow.—The 2d. maximum fare for any distance beyond the 1d. stage, introduced on the Glasgow Tramways in the middle of last year, continues to produce higher traffic receipts. From the beginning of the financial year on June 1, 1926, until Feb. 7, 1927, there was an increase in revenue of £2,255 after wiping out a decrease of £10,000 when the old graded fares were in operation.

Escalators Increase Traffic in London Stations—Traffic has increased in tube railway stations in London since escalators have replaced stairs. The reconstructed station at Picadilly Circus will have at least eleven of them and will handle an annual traffic of 50,000.000 passengers. At the present time there are 64 of these moving stairs in 30 of the city's stations. When the present scheme of extension is completed 85 escalators will be installed at 34 stations. One up and down escalator is said to have the capacity of five stairways. The speed of the individual escalator is little more than 1 m.p.h., but the total number on the system in the course of a twenty-hour day travel about 1,500 miles. When the scheme is completed the daily performance will be 2,000 miles.

Recent Bus Developments

Allentown Problem Solved

Lehigh Valley Transit Official Discovers Efficacy of Schedule Cards in Education of Potential Bus Riders

"Getting the people to know your schedule is the same thing as advertising your service. The cost is a comparatively small one—the result is big, in our case, at least." This is the opinion of Henry F. Dicke, assistant to the president of the Lehigh Valley Transit Company, Allentown, Pa., who was confronted with the problem of selling the bus to the riding public. The idea was brought forward that a substantial, hard-wearing time-table would be an ever-present reminder of the bus lines. Accordingly celluloid cards were printed and 20,000 distributed through the bus passengers and among the big plants and stores. Upon one side was the picture of the new bus in its natural colors, topped by the caption "Turner Street Bus Line," and below, "The Lehigh Valley Transportation Company." On the reverse side was the schedule, telling of the time of arrivals at each of the important intersections, daily and nightly, eastbound and westbound. The card fitted nicely into a wallet or a vest pocket. The schedule card proved to be not only a convenience and reminder but also the final and necessary touch to the company's campaign for the installation of bus service.

When the Lehigh Valley Transit Company, under the title of the Lehigh Valley Transportation Company, recently added four large Mack buses to the organization it became noticeable that although the bus fleet covered the major part of its route through a section which needed additional transit facilities many potential passengers waited upon a spot where there were rails and trolley wire. Years and years of habit were driving them to walk varying distances to ride upon a car, while they might as well have saved the walk and taken the bus, which was being run directly for their convenience. A survey among the people of the territory covered by the bus lines revealed the fact that those who had clamored for the service knew nothing of the schedule of the buses, although the time-table had been published frequently in the papers. It was soon learned that the average person as he scanned the printed page would not cut out such a list because the paper soiled quickly and the wear and tear destroyed it in a short time.

In addition to the company's scheme to print the schedule card the buses were routed along Hamilton Street, the main thoroughfare. The buses stopped at the same loading platform as did the trolleys. The bright red and yellow coloring of the buses was distinctive and it created attention. People began to notice the buses. Presently the number of bus passengers began to mount.

A service has been started for parties and clubs, carrying them everywhere. This phase of the service received a most decided impetus when the Allentown Chamber of Commerce was convinced of the practicability of using two buses to transport its party on a recent "Good Fellowship Tour" to Wildwood and Atlantic City.

Substitution of Buses Being Approved

Permission has been granted the Morris County Traction Company by the Borough Council of Wharton, N. J., to substitute buses for the electric railway in the borough. The terminus, however, will not extend northward beyond the Central Railroad station, which is two blocks farther than the present terminal. The railway had asked permission to extend its lines to North Main Street, in the Luxemburg section, but residents of that section affirmed, in a petition, their belief that the present bus service given by F. B. Sheldon & Son is satisfactory. A 5-cent fare was proposed by the railway as an incentive to permit the extension of the line to Langdon's corner.

With one or two exceptions all communities along the railway have approved the change of transportation and within a few months it is likely buses will be in operation over the entire length of the old railway route.

Long Island Utility Should Be Preserved

The Public Service Commission denied on March 25 the petition of the Northport Transportation Company, Inc., for a certificate of public convenience and necessity for a bus line between Halesite and Huntington Station, Long Island, N. Y. The petitioner is now and has been for some time operating a bus line about 8 miles long from Vernon Valley, Northport and Cole Spring Harbor. The proposed route is about 3 miles long and directly competes with the Huntington Traction Company, which opposed this petition.

Investigation by the commission's engineers revealed that the tracks and equipment of the traction company were well maintained and in safe condition to operate; some maintenance work, however, was required. At the hearing it developed that bus transportation service rather than electric railway service was preferred by many residents. Under a special act passed by the Legislature in 1926 authorizing the substitution of bus service for the electric railway with the consent of the local authorities, the railway secured such consent. The commission in denying the bus petition ruled that competition on this line, if permitted, would mean that neither company would be able to operate with financial success and probably the existing utility would be destroyed.

Prospective Competitor in Buffalo Heard

Ernest M. Howe of the Buffalo Motor Coach Corporation, which is seeking a certificate of convenience and necessity from the New York State Public Service Commission for the operation of four bus lines in Buffalo, outlined details of the company, its financial status and its proposed plans at a series of hearings before Commissioner Pooley in Buffalo.

Mr. Howe said the new bus company will start operations with approximately $325,000 in assets, against $250,000 in subscribed capital. He said there will be an unfunded debt of $75,000. The company expects to operate 1,000,000 bus-miles annually with an average passenger pick-up per bus-mile or five or more passengers at an 8-cent cash fare. On that basis the minimum number of passengers carried annually, Mr. Howe said, would be 5,000,000. The estimated operating costs per mile, figuring in 20 per cent depreciation of vehicles, supervision and other items, would be 32 to 32½ cents per bus-mile. Mr. Howe said the company will buy 25 buses at $10,000 each, paying down $175,000.

After reviewing the railway situation in general President Youngbluth of the International Railway said in substance:

> Buffalo is in the same case with many other cities, and International Railway has the same troubles and problems faced by almost all other systems. Things are getting a little better, generally and locally. In 1926 this system, for the first time in many years, earned its depreciation reserve.
>
> Now comes the Buffalo Motor Coach Company proposition. Any independent bus system, of necessity, must be competitive, and this one would be highly competitive. It was laid out so that its three lines would reach one-fourth of the city population. Of course, it could not serve that population without connecting and cross-town lines. Mr. Howe estimates that it will take in at least $400,000. Whatever it takes in will be subtracted from International Railway, because this proposed competition will not generate new business of any appreciable amount.
>
> If the community wants a railway system, and in the present state of the transportation industry it is certain that the city needs such a system, it cannot afford to expose that system to ruinous competition which robs it of the most profitable business. Short, straight rides, without transfers, are the rides which make money. These rides are the ones which the Buffalo Motor Coach Company plans to take away.
>
> Co-ordinated service of railway and bus, with one fare and universal transfer, is better than cut-throat competition and two fares for one ride. It is not possible to have one good city-wide service with competition for the part of the business that absorbs losses and furnishes profits.

Substitution Decision Rests with Marinette

Substitution of bus service for railway service looms in Marinette and Menominee. At the hearing recently held in Marinette by the Wisconsin Railroad Commission to ascertain the extent to which the Menominee & Marinette Light & Traction Company would be willing to share in the cost of new bridges over the Menominee River between the Twin Cities, J. P. Pulliam, vice-president and general manager of the company, disclosed that street railway service was supplied at a loss of $80,000 last year in Marinette and Menominee. This makes the total operating deficit close to $500,000 since the company purchased the system. In the light of these disclosures and the additional explanation that any attempt to recoup these losses through increased rates would require prohibitive fares, discussion at the hearing switched to the substitution of buses as the facts submitted clearly indicated the company's inability to share in the cost of the new bridges. On this point Mr. Pulliam declared that the company would gladly surrender any railway or bus rights it has in these cities, but if some common ground could be reached by all parties the company would be willing to contract to maintain bus service in and between the two cities.

It will be recalled that the ELECTRIC RAILWAY JOURNAL reported in its columns a few months ago that the City Council of Marinette rejected the proposal of the company to substitute bus service on a four months trial basis, railway service to be restored if the change did not meet with approval.

Profit-Sharing for Fifth Avenue Employees

Directors of the Fifth Avenue Coach Company, New York, have approved the principle of profit sharing and the installation of a profit-sharing plan for the benefit of the employees has been authorized. Under a plan effective April 1, 1927, 10 per cent of the net income from the transportation business will be allotted to employees at the end of the year as follows:

1. To present employees who are still in service Dec. 31, 1927.
2. To persons hereafter employed who are still in service on Dec. 31, 1927. Such new employees, however, must serve three months before they begin to participate in the profits.

To give an idea of what this arrangement means, 10 per cent of the net earnings from the transportation operation as applied to the last three years would have been

$115,000 in 1924
115,000 in 1925
97,000 in 1926

Under present conditions approximately 1,850 men will benefit.

The officers, executives and heads of departments will not share in the 10 per cent of the profits above mentioned.

The company says:

> The management recognizes that the present high character of its service is due in large part to its employees. Their deep interest in their work is reflected in a very low annual labor "turnover." By this plan each man by doing his part well can increase the patronage of the company, heighten the usefulness of the service to the public and at the same time increase his own earnings.

Further studies, now under way, will be completed about April 15.

Substitution in Eugene Unlikely

Despite the fact that the Oregon Commission some time ago granted an application of the Eugene Street Railway to substitute service by bus for electric railway service, there has been no noticeable decrease in the operation of the railway. Reports filed with the commission indicate, in fact, that more cars are being added to the service and that patronage has improved greatly since the announcement of the proposed change to motor vehicles. In the event of continued fair patronage, officials state that railway service in Eugene will not be discontinued.

More Bus Substitutions in Westchester

Abandonment of railway lines and the substitution of buses in southern Connecticut and Westchester County are sought in petitions which the New York, New Haven & Hartford Railroad and affiliated companies are preparing to file with the Public Utilities Commission. Everett Miller, president of the New York & Stamford Railway, disclosed that the petitions were to be filed as "the result of negotiations initiated nearly a year ago by the Traffic Commission of the Greenwich Chamber of Commerce." The New York & Stamford uses an interstate railway line which, in part of its territory, leases and operates lines owned by the petitioners. This company had announced that on April 3 the railway operating locally in Portchester would be abandoned and buses installed sufficient to afford a twenty-minute service. It is understood that if the petitions are granted the companies will cancel their present leases with the New York & Stamford Railway and will release their rights-of-way to this company for the motor coach routes.

Seeks Interurban Substitution.—The Mesaba Railway, Virginia, Minn., is planning to abandon its line between Gilbert and Hibbing as authorized by the federal court. At present public conveyances between the two towns are a rail and a bus line. Committees representing eleven range towns are seeking assurance from the Mesaba Railway Coach Company that transportation facilities will be adequate after the rail line has been abandoned. The bus and railway line are jointly owned.

Bus Operation Results in Loss.—Operation of buses in and between Superior and Duluth failed to net a profit for the Duluth Street Railway during 1926, according to the report filed with the Wisconsin Railroad Commission on the activities of the Superior-Duluth Coach Company, a subsidiary. The report revealed a loss of $6,379 last year. Operating revenues were $101,679 and expenses $103,256, a loss of $1,577, to which must be added taxes of $4,802. Operating expense covered $10.486 in bridge tolls for the use of the interstate bridge between Superior and Duluth. If the company had been relieved of this expense, the profit in 1926 would have been $4,089.

Will Continue Bus Operation—Despite reports that the New England Transportation Company would take over buses now operated by the Worcester Consolidated Street Railway, Worcester, Mass., Howard R. Whitney, vice-president of the railway, said his company would continue to operate the lines where they have developed the business. The railway will continue to operate in the sections where bus and railway service have been given.

Bus for Churchgoers.—The Boston Elevated Railway, Boston, Mass., has established a special Sunday bus service between the Park Street subway station and the Old North Church for the accommodation of churchgoers. The service was started March 27. So popular was the idea that the bus made three trips to serve 75 passengers.

Financial and Corporate

$494,471 Carried to Surplus

Market Street Railway, San Francisco, Reduces Debt $634,000—Showing Good All Elements Considered

Operating revenues of the Market Street Railway, San Francisco, for the year 1926 remained practically the same as the previous year. Due principally to increased wages of trainmen, effective early in the year, net earnings decreased as compared with 1925. Funded debt in the hands of the public was reduced $634,000 and there was no increase in the amount of capital stock outstanding. No dividends were paid. Capital expenditures during 1926 were $244,564. The sum of $1,346,243 was expended for maintenance of way and structures and rolling stock and equipment. A balance of $494,471 was carried to surplus.

The company operates its properties under a number of franchises, some of which expire in 1929, while others continue as long as 1952. In view of this situation the Board of Supervisors of the city and county of San Francisco has appointed a committee to study transportation problems and formulate a comprehensive program for future development.

SUMMARY OF INCOME STATEMENT OF MARKET STREET RAILWAY FOR 1926

Operating revenue		$9,891,667
Operating expenses and taxes except federal income tax		8,019,093
Net operating revenue before provision for depreciation		$1,872,574
Other income		53,453
Gross income		$1,926,027
Income charges:		
Interest on funded debt	$845,148	
Discount on funded debt	53,113	
Provision for 1926 federal income tax—company's estimate	74,423	
Depreciation of railroads and properties	500,000	
Other	25,628	
Total		$1,498,312
Net income		$427,715
Other profit and loss credits		66,756
Surplus		$494,471

Operating revenue for 1926 was $9,891,667, a decrease of $11,100 under 1925. The slightly reduced passenger receipts were due partly to a building trades strike, which continued through most of the year, and partly to the fact that the previous year was benefited by the celebration of California's 75th anniversary as a state.

Operating expenses, including taxes other than federal income tax, were $8,019,093, an increase of $344,285, or 4½ per cent, over 1925. This increase was mainly due to an increase in the wages of employees effective on March 1, 1926.

Thirty new cars were built in the company's own shops, and a number of others cars were remodeled to provide open-air sections in response to popular demand. During the year the company started a bus line through the rapidly growing Excelsior district.

Expenses incident to injuries and damages were 30.18 per cent less than in 1925. Statistics indicate that collision accidents per car-mile were reduced 26 per cent. This result is attributed largely to the company's policy, started during the year, of painting the front and rear ends of all cars white, and indirectly lighting them at night, to increase visibility. About one-half of the cars have been processed in this fashion and the remaining cars will be given white ends during 1927.

The company owns 773 passenger cars, operates 274 miles of single track, and during 1926 carried 265,563,016 passengers.

Montreal Tramways & Power to Be Liquidated

A special meeting of shareholders of the Montreal Tramways & Power Company, held at Montreal, Que., on March 19, virtually marked the passing of that company from existence, a resolution being passed appointing a liquidator who will wind up the affairs of the company. Another meeting will be held on April 4, but this is merely a matter of routine to comply with the English laws, under which the company was incorporated.

Inasmuch as United Securities, Ltd., owns practically all shares of the common stock of the Montreal Tramways & Power Company, Ltd., it follows that this company will receive practically the entire stock of the Consolidated Securities, Ltd., so that United Securities, Ltd., will automatically hold the control through the new medium of the shares of the Montreal Tramways as it has done previously through the medium of the Montreal Tramways & Power Company, Ltd., the English company.

$534,308 Profit in Louisville

Annual Report Discloses Decline in Traffic—Company Awaits Decision on Bus Competition—Review of Matters Affecting Railway

Passenger traffic on lines of the Louisville Railway, Louisville, Ky., dropped 479,705 riders in 1926 on account of an increase of about 5,000 autos. However, the company finished the year with a net profit of $534,308 against $480,557 for 1925, or an increase of $53,756. These facts were disclosed by James P. Barnes, president, at the recent stockholders' meeting.

Railway passenger traffic fluctuated through the year. January, February (when the rate was increased to a 7-cent straight fare under the terms of Ordinance No. 330, then in effect), May, June, July and September showed increases in passengers carried, which offset the decreased riding in March, April and August. The entire year showed a decrease of 479,705 passengers carried, compared with 1925, all of which decrease occurred in the last three months of 1926, due to unemployment and industrial depression. Total passenger traffic, which includes revenue, transfer and free passengers, compared with the four preceding years, was as follows:

	1922	1923	1924	1925	1926
January	7,600,072	7,861,986	8,435,464	8,297,839	8,633,543
February	6,830,188	7,371,936	7,957,906	7,562,261	7,590,218
March	7,760,463	8,498,345	8,515,182	8,354,832	8,274,959
April	7,686,732	8,341,493	8,422,780	8,214,226	8,145,383
May	8,170,426	8,920,188	8,844,856	8,469,877	8,603,531
June	8,659,721	8,211,428	8,097,217	7,837,978	7,905,530
July	7,401,345	7,943,088	7,712,320	7,648,982	7,697,183
August	7,333,738	7,827,996	7,549,678	7,744,573	7,471,624
September	7,735,517	8,125,974	7,850,813	7,995,353	8,004,341
October	7,976,451	8,257,865	8,334,069	8,395,428	8,235,552
November	7,731,835	8,059,261	7,720,786	8,048,480	7,894,275
December	8,013,257	8,250,837	8,298,196	8,564,736	8,189,721
Total	91,899,745	97,670,397	97,739,267	97,134,565	96,654,860

The negotiations in January, 1926, with the Board of Public Works turned largely upon certain differences of opinion with regard to construction of certain sections of Ordinance No. 330, which became effective in September, 1922, and under which the so-called barometer fund plan of service-at-cost had been carried out for three years. The differences were amicably adjusted and under the provisions of that ordinance a 7-cent fare went into effect on Feb. 1, 1926. A large and carefully planned publicity campaign resulted in

COMPARATIVE INCOME STATEMENT OF LOUISVILLE RAILWAY

	1926	1925
Operating revenues:		
Revenue from transporation	$4,665,693	$4,239,571
Other operating revenues	197,612	189,544
Total operating revenues	$4,863,305	$4,429,115
Operating expenses	3,275,786	2,962,512
Net revenue from operations	1,587,518	1,466,602
Taxes	461,000	431,000
Railway operating income	1,126,518	1,035,602
Bus operating income	31,566	....
Total net operating income	$1,094,952	$1,035,602
Non-operating income:		
Louisville & Interurban Railway net income	82,903	88,637
Other non-operating income	10,228	10,432
Total non-operating income	$93,131	$99,070
Gross income	1,188,083	1,134,673
Deductions from gross income:		
Interest on bonds and notes	651,750	651,750
Miscellaneous debits	2,025	2,366
Total deductions	$653,775	$654,116
Balance available for dividends on stock	$534'308	$480,557

the adoption of Ordinance No. 361, Series 1926, which follows the principles of regulation embodied in the federal transportation act of 1920. Thus the city committed itself to the definite policy of a regulated transportation service at a rate such as to yield to the investor a reasonable return upon the value of property used and useful in the public service. In determination of the value of the property so used the ordinance provides for a valuation, and the Beeler Organization was selected to conduct this appraisal, a work upon which it is now engaged.

Ordinance No. 361, Series 1926, which became effective on Sept. 13, 1926, contemplates a co-ordinated bus and railway service, with motor coaches serving as feeders and connections to railway lines in territory not presently served by street cars. This service is conducted at a 10-cent bus fare with transfer to and from street cars.

Move to Prevent Unfair Competition

On Jan. 17, 1927, an organization incorporated under the name of Peoples Transit Company started competitive bus operations. This operation competed with one of the railway's best lines and was carried on under jitney bus license. As these coaches operated between fixed terminals, on a regular schedule and over a regular route, the railway felt a franchise was necessary for their operation and suit was immediately filed for an injunction restraining the Peoples Transit Company from operating without such franchise. A temporary injunction was granted under date of Jan. 28, 1927, and operations of the competitive bus lines immediately stopped, pending decision of the Court of Appeals. The injunction has been made permanent and the case is being prepared for final argument in the Court of Appeals.

During 1926 the current dividends were paid on preferred stock, 2½ per cent on April 1 and 2½ per cent on Oct. 1. On Oct. 1, 1926, $2 a share was paid on common stock, the first dividend paid on this class of stock since July 1. 1918, and on Jan. 3, 1927, a dividend of $1 a share was paid on common stock. These dividends were paid out of the 1926 net earnings, a balance of $109,600 over and above dividend requirements being carried to the company's surplus account.

The work of the safety department in decreasing preventable accidents has progressed remarkably during the past five years, as reflected in the following figures:

STATEMENT SHOWING ACCIDENT TREND ON LOUISVILLE RAILWAY

	1922	1923	1924	1925	1926
Accidents	3,272	3,404	1,825	1,534	1,157
Miles operated per accident	3,323	3,380	6,390	7,432	10,386

This improvement was made in spite of the tremendous increase of motor vehicles on the streets. The safety dinners were continued throughout the year, given monthly to the carhouse operating the greatest number of miles per accident. The system average has increased from 1,800 miles per accident in 1920, prior to the start of the accident elimination contests, to 10,386 miles per accident in 1926. Two hundred and sixteen employees operated during 1926 without an accident, compared with 179 in 1925 and 136 in 1924.

Of the 1,634 employees of the Louisville Railway, the Louisville & Interurban Railroad and the Kentucky Carriers, Inc., on Dec. 31, 1926, 1,320 were enrolled in the Co-operative Association. There was a decrease in death and sick benefits in 1926 compared with 1925, as indicated in the following tabulation:

	1925	1926
Death benefits paid	$8,250	$6,300
Sick benefits paid	13,243	12,789
Nursing service	514	458

There was added to the surplus of the association during the year $9,904.

In his report Mr. Barnes referred to the Anthony F. Connelly award, established in 1925, in memory of Anthony F. Connelly, chief inspector, who died on Dec. 3, 1925, with a service with the company extending over 50 years. This award brought forth 50 nominations for the award, as outlined in the 1925 annual report. From these 50 names the Connelly award committee selected three employees whose records were of outstanding merit. George W. Kenn, a conductor at Thirteenth and Main carhouse, was awarded the Anthony F. Connelly award gold medal and $75 in cash, which is furnished from the fund set up by one of the directors of the company, and a trip to the annual American Electric Railway Association convention at Cleveland, Ohio. Two other employees were given bronze medals of honorable mention. Announcement of the winner for 1926 will be made in the near future.

Other subjects listed and discussed by President Barnes in his report are power, way, overhead department, jitneys, grade crossing elimination and equipment.

Sale at Foreclosure Ahead for Morris County Traction

Application will be made soon to the federal court for permission to sell the property of the Morris County Traction Company, Morristown, N. J. Elmer King of Morristown, counsel for the receivers of the company, will make the application before Judge Runyon. The sale plan was mentioned by Mr. King in opposing a motion to direct the receivers to pay a judgment. Mr. King said there were no funds with which the receivers could pay the claim. In the sale and reorganization of the company it is planned to convert it into a bus line. Forty-two buses, costing more than $400,000, are expected to be used. The road has been in the hands of Joseph P. Tumulty and Joseph K. Choate as receivers for four years. The progress of the plan to change to buses is discussed elsewhere in this issue.

U. G. I. Buys Into the National Public Service

Announcement has been made that the United Gas Improvement Company, Philadelphia, Pa., has acquired a minority interest in the common stock of the National Public Service Corporation, control of which passed recently from the Fitkin interests to Day & Zimmermann and their associates. Despite the construction placed on this event in some of the daily papers, there is no change involved from the status of affair with respect to this company reflected in the article in the ELECTRIC RAILWAY JOURNAL for March 19, page 553. Day & Zimmermann will continue through the General Engineering & Management Corporation to manage and operate the properties included in the National Public Service group.

Terms of Sale of Coral Gables Road Approved

The Florida Railroad Commission recently approved the sale of the Coral Gables Rapid Transit Corporation and all its properties to the city of Coral Gables, Fla. The sale was conditioned upon the assumption by the purchaser of all fines, dues, obligations and liabilities of the company. The purchase price was given as $1,782,000. Reference was made to the sale in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 19, 1927, page 359. According to City Engineer Friedman, the extension of the Coral Gables Rapid Transit System has been completed into central Miami. The line eventually will be extended to the proposed Seaboard Railway station.

Dividend Omitted by Chicago City Railway

Omission of the regular quarterly dividend by the Chicago City Railway of 1½ per cent on the capital stock was announced in a letter to stockholders from Leonard A. Busby, president, on March 27. The dividened of $1.50 per share is payable on April 1, but the board of directors at a recent meeting decided to defer action, due to the unsettled relations of the company with the city.

Among the reasons for this action, the letter stated, is the fact that the operating rights under the company's franchise expired on Feb. 1, and while an extension of six months has been granted by the city, the agreement can be terminated on 30 days notice.

Another difficulty, the statement points out, is "the question of enabling legislation necessary to bring unification of the traction properties and to enable the city to grant a modern type of franchise, which is still pending in Springfield. Our first mortgage bonds, amounting to $33,926,000, are past due and unpaid. In this situation the board felt that the declaration of a dividend at this time would not be warranted."

As the company now is situated, it is impossible either to refund or extend the period of the life of the funded debt.

Last year the company earned 10.15 per cent on the capital stock, the closing year under the old franchise being the best in the history of the Chicago traction properties from the standpoint of both revenue and traffic handled. The Chicago City Railway paid off its $786,744 in bank loans and the profit and loss surplus was increased to $4,074,987.

In conclusion, the latter said:

> We wish to assure stockholders that the earnings of the company, over and above our first mortgage bond requirements, will be conserved for their benefit.

The Chicago City Railway operates all the south side lines composing the Chicago Surface Lines system.

Reorganization Committee Reviews Kansas City Affairs

Affairs of the Kansas City Railways, Kansas City, Mo., are discussed in a circular addressed by the reorganization committee to the holders of deposit for first mortgage 5 per cent bonds, three-year 7 per cent collateral notes and two-year 6 per cent collateral notes. Much of the information contained in the circular recapitulates news of the events in connection with the reorganization recorded from time to time in the ELECTRIC RAILWAY JOURNAL. It has seemed well to repeat at this time the fact that under the terms of the reorganization plan the preferred stock and the common stock issued by the Kansas City Public Service Company, the successor company, have been deposited under a voting trust agreement dated July 1, 1926, and extending for five years. Voting trust certificates in temporary form are in process of issuance for ultimate distribution to depositors.

On the subjects of rehabilitation, litigation and distribution of securities the circular says:

> Since taking over the property on Oct. 15, 1926, substantial progress has been made in the rehabilitation and improvement program. Approximately 10 miles of track on important trunk lines has been completely rebuilt, together with new concrete foundations and paving. The elevated railroad in the so-called "West Bottoms," condemned as unsafe and abandoned in 1923, is being restored as a combined elevated and surface line, with necessary inclines, thereby giving much needed service to the industrial district along the Kaw River. The rolling stock is being thoroughly reconditioned, and numerous other improvements installed over the system. This work should show substantial results in 1927 and subsequent years through decreased costs and increased earnings.
>
> There is now pending in the federal Circuit Court of Appeals for the Eighth Circuit, four appeals by junior bondholders, other creditors and stockholders from various decrees of the court entered in the receivership proceedings. The preferred stockholders and the holders of certain notes have appealed from the final decree of foreclosure, and the second mortgage bondholders and preferred stockholders have appealed from the decree confirming sale.
>
> In view of the franchise situation and the pending litigation, the committee has deemed it inadvisable to proceed to an immediate distribution of the new securities (bonds and preferred and common stock, or voting trust certificates therefor) provided for depositors in the plan of reorganization, but anticipates that such distribution can be properly accomplished during the next few months, together with such interest and dividends as may have been paid thereon in the interim. It is expected that the new bonds issued in reorganization will be dated and will bear interest from July 1, 1926, or, if dated later, will carry warrants entitling the holder to an amount of cash equivalent to interest at the rate of 6 per cent on the principal amount from July 1, 1926, to such later date.

$105,968 Increase in West Penn Net

System Near Pittsburgh Does Well—Marked Progress Made in Reducing the Funded Debt

Net income of the West Penn Railways, Pittsburgh, Pa., for the year ended Dec. 31, 1926, was $2,604,331 compared with $2,498,363 for the previous year. In general, the year's operations were most satisfactory. A. M. Lynn, president, explains that the revisions of line and other improvements made during recent years enabled these results to be achieved, in some instances having reduced the number of cars without change in headway. Proposed revisions in line, rehabilitation of tracks and installation of improved signal systems are expected to result in further improvements in service. The general tendency of the public to relieve electric railways from burdensome franchise obligations, particularly as they appertain to maintenance and replacement of paving, is becoming more pronounced. The company has under negotiations franchises in many municipalities which will no doubt result in substantial relief.

CONSOLIDATED INCOME ACCOUNT OF WEST PENN RAILWAYS EXCLUDING INTER-COMPANY ITEMS

	1926	1925
Gross earnings from all sources	$22,157,054	$20,206,221
Operating expenses, including maintenance, taxes and rentals	11,594,947	11,169,278
	$10,562,107	$9,036,942
Less:		
Interest and amortization	3,690,278	3,375,715
Preferred dividends of subsidiary	1,173,152	909,195
Income applicable to minority interest	1,092,500	587,889
	$5,955,931	$4,872,800
Balance	4,606,175	4,164,141
Reserved for renewals, replacements and depletion	2,001,843	1,665,778
Net income	$2,604,331	$2,498,363

The co-operation of the State Highway Department in Pennsylvania has made possible in several instances the removal of tracks to private right-of-way alongside highways, resulting in safer operation, more economical maintenance and improved service and running time.

Freight service between Pittsburgh and important coke region towns, started in 1924, is growing to be an important factor in the company's revenues. In addition to the larger and more adequate freight house erected in Greensburg, improvements have been made to facilities in Uniontown, Pa.

The use of the "Sunday pass" for long interurban rides, first adopted in 1925, has been extended and placed on a permanent basis. Weekly passes for local city service have also been started. Both of these show very satisfactory results. The company has entered into the bus business in certain localities where service can be undertaken and rendered supplementary to the railway lines.

In July, 1926, the company consummated its agreement made in 1916 by the sale of Connellsville power station to the West Penn Power Company. The proceeds of this sale were placed with the Equitable Trust Company, New York, trustee of the first mortgage of April 1, 1905. The trustee called for tenders and retired to Dec. 31, $1,497,500 of 5 per cent first mortgage gold bonds of the company, due Jan. 1, 1931, leaving on hand for further redemption of bonds the sum of $1,496,300. Mr. Lynn explains that if further purchases can be made at satisfactory prices, the company will continue to redeem bonds to the exhaustion of the fund, temporarily invested in United States government obligations, with any balance utilized for improvements and extensions of its physical properties.

On Sept. 1, 1926, the company called and retired all of its outstanding three-year 6½ per cent gold debentures, due April 1, 1927, aggregating $3,500,000, funds having been made available to its treasury through reimbursement by certain subsidiary companies to which temporary advances had heretofore been made for construction, now funded. All of the company's outstanding first equipment trust 8 per cent notes of 1921, aggregating $120,000, were retired on Oct. 1, 1926.

During the year there were purchased $102,000 principal amount of 5 per cent first mortgage gold bonds of the Pittsburg, McKeesport & Greensburg Railway, now a direct obligation of West Penn Railways, reducing the amount of these bonds outstanding in the hands of the public to the sum of $271,000. The company also purchased through the trustee $7,000 principal amount of first mortgage 5 per cent gold bonds of West Penn Traction Company, issued under first mortgage of that company dated June 1, 1910. The amount of these bonds now outstanding has been reduced to $4,847,000.

As they matured from time to time during the year the West Penn Railways retired or purchased and retained in its treasury the following bonds of the Wheeling Traction System:

Wheeling Traction Company five year 8 per cent Wheeling Bridge collateral gold notes (retired)	$90,000
Twenty-year 5 per cent first mortgage gold bonds of the Wheeling & Western Railway ($2,000 yet to be presented)	182,000
Twenty-year 5 per cent first mortgage gold bonds of the Bellaire-Southwestern Traction Company	50,000
	$322,000

Mr. Lynn points out that the retirement of $5,548,500 of funded obligations of the company and its subsidiary railway companies during the year 1926, in almost all instances in anticipation of their maturity, will prove to be of advantage in handling its financial affairs in future years.

Refunding Plan in Cincinnati.—The Cincinnati Street Railway, Cincinnati, Ohio, is said to be arranging to refund an issue of $4,500,000 short term notes and supplant them with long term bonds. The notes are of three years duration and pay 6 per cent interest. The bonds are to bear a rate of interest lower than the notes, but it is expected that their longevity will attract note holders and other investors.

Legal Notes

INDIANA.—*Company Suspends Uninsulated Wire at Peril.*

The electric company owned and operated a line of poles along a public highway, on which were strung bare uninsulated wires carrying 6,000 volts. Plaintiff was engaged in moving his house along the highway and in order that the house might pass under certain guy wires which were not far enough from the ground to permit passage of the house, he climbed on the roof and accidentally came in contact with one of the uninsulated electric wires which was about 3 ft. above the guy wire and roof of the house, thereby receiving an electric shock which resulted in a serious injury. Under the state law the defendant is required to provide full and complete insulation of wires transmitting electricity at points where the public is liable to come in contact with such wires. It was held that in suspending an uninsulated wire across the highway the company does so at peril, and judgment for p'aintiff was affirmed. [Linn Grove L. & P. Co., vs. Fennig, 154 N. E., 877.]

MARYLAND. — *Carriers — Taxation of Easements.*

Street railroad's right in street is an easement, subject to taxation, but in fiixing the value of such easement in street for purpose of rate basis, the Public Utilities Commission cannot consider such value as is dependent on use to which franchise of corporation permits easement to be put. [Miles vs. West, et al, 135 Atl., 579.]

MICHIGAN.—*Plaintiff Was Allowed to Express Views.*

In an action against the street railroad for personal injuries and damages to auto struck by street car, plaintiff was properly permitted to express opinion as to the speed of the street car, under evidence showing he saw the car when he turned on the track, and also showing that he had driven automobiles for some time. [Mills vs. Michigan Elec. Ry. Co., 212 N. W., 75.]

MINNESOTA. — *Fog Should Prevent Usual Speed of Car.*

A single track of the railway company was laid west of the center of the road. A northbound car, traveling at its usual speed through a heavy fog, struck a southbound auto, killing two of its occupants. A verdict in behalf of the next of kin of one of the occupants was affirmed, the court stating that weather conditions often demand increased vigilance on the part of those who use highways not only for their own but for the safety of others, and under the above conditions it was negligence for the operator of the trolley car to travel at the usual speed. [Kimpell vs. Duluth St. Ry., 211 N. W., 955.]

NEW JERSEY. — *Truck Helper Was Guilty of Negligence.*

Plaintiff was a helper on a truck proceeding on a road where there were tracks on both sides of the highway. A trolley was going in the same direction. Driver of truck drew it up alongside and quite near the trolley road on the right side. The plaintiff jumped off the truck and was immediately struck by the trolley car. Held that plaintiff was guilty of contributory negligence and verdict in his favor set aside. [Markowski vs. P. S. Ry. Co., 135 Atl., 783.]

NEW YORK.—*Receivership Does Not Exempt Street Railroads from Penalties.*

A street railroad corporation is not exempt from penalties for failing to pay certain percentage of gross income to city as required by its contracts under Railroad Law, N. Y. Sect. 175, because it is operated by a receiver appointed by the court. [City of New York vs. Brooklyn, Q. C. & S. R. Co., 219 N. Y. S., 399.]

NEW YORK.—*Stock Ownership Is Insufficient to Hold Dominant Company with Liability for Injuries of Subsidiary.*

Plaintiff was injured while leaving a car, through the negligence of the motorman. The franchise to operate a street railroad along the route on which the car was traveling belongs to the 42d Street, Manhattanville & St. Nicholas Avenue Railway. Substantially all of the stock of that company is owned by the Third Avenue Railway, which has its own franchises along other streets. An attempt was made to hold the latter company liable for the injury on the theory that under the screen of this subsidiary and others it operates for itself the entire system of connected roads, and is therefore liable for the torts of the consolidated enterprise. Held that stock ownership alone is insufficient to charge dominant railroad with liability for torts of the subsidiary. [Berkey vs. Third Ave. Ry., 155 N. E., 58.]

NEW YORK —*Power of State in Rate Fixing Defined.*

A state, through its proper agencies, has power to increase or lower rates charged by public service corporation, notwithstanding the existence of a contract providing for lesser or higher rate, and exercise of that power does not violate state or federal constitution. [Niagara, Lockport & Ontario Power Co., vs. Seneca Iron & Steel Co., 219 N. Y. S., 418.]

OHIO.—*Injuries at Safety Zones.*

A ten-year-old girl, standing in a safety zone, was struck by the rear end of a trolley car which was passing her. The allegations of negligence were that the car was going at a high rate of speed; that the motorman failed to ring his gong, and that the car did not stop in time to avoid the accident. There was no allegation that there was any projection on the rear of the car which might have produced the injury. Testimony showed the child had seen the car approaching, and it was accordingly held that recovery could not be based on the failure of the motorman to ring his gong and that such allegations were not therefore material. [Steinman vs. Cleveland Ry., 155 N. E., 149.]

OHIO.—*Casual Service Not Proper Subject of Certificate of Convenience and Necessity.*

A bus company received from the Public Utilities Commission a certificate of public convenience and necessity to operate motor transportation passenger service on irregular routes, "over all public highways, roads and streets in the state of Ohio." The law requires publication of all applications for such certificates in a newspaper of general circulation, published at the county seat of each county through which the applicant proposes to operate, or in a newspaper of general circulation throughout the territory in or through which the applicant proposes to operate. Publication in five newspapers issued in different parts of the state was held by the Commission to be "substantial compliance" with this part of the law, but it was held inadequate by the Court. The Court also held that such a certificate over highways already traversed by regular routes is unauthorized, where it is not shown that the regular lines in that section are not furnishing reasonable facilities and that casual and unusual service of the kind proposed is not proper subject matter of a certificate of public convenience and necessity. [Lake Shore Electric Railway vs. Public Utilities Commission of Ohio and other cases. 154 Northeast. Rep., 239.]

OKLAHOMA.—*Bus Line Must Justify Certificate of Convenience and Necessity.*

To warrant licensing of additional public utility, it must appear that present facilities are inadequate and inconvenient to traveling public. That proposed bus line, serving same territory as railroad, may accommodate few individuals, does not justify certificate of "convenience and necessity." [Chicago, R. I. & P. Ry., vs. State, 252 Pac., 849.]

PENNSYLVANIA. — *Expert May Testify on His Own Examination.*

A medical expert may testify as to symptoms and sensations narrated by patient for the purpose of securing correct diagnosis and give his professional judgment as to the effects of injury, based on his own physical examination of injured party, but not on what others have told him, though he was fully advised of history of case. [McMinis vs. Phila. Rapid Transit Co., 135 Atl., 722.]

PENNSYLVANIA. — *Pedestrian Should Cross Street Only When Action Does Not Seem Hazardous.*

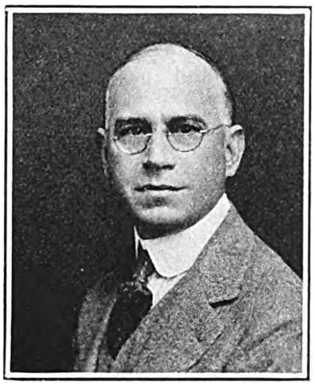
A young man in full possession of his faculties was held guilty of contributory negligence as a matter of law. barring recovery for injuries sustained as a result of stepping in front of a moving street car which was in plain sight in broad daylight, with nothing to obstruct his view or distract his attention when he started across the street from a wagon on the opposite side. A pedestrian may properly attempt to cross a street car track on which a car is approaching when there appears to be sufficient opportunity to do so safely, but not when to do so appears hazardous. [Schuchalter vs. Phila. Rapid Transit Co., 135 Atl., 739.]

Personal Items

R. B. Stearns Honored

Operating Head of Eastern Massachusetts Company Made President of New England Club

Because of his outstanding accomplishments in the West, especially in Milwaukee, R. B. Stearns received a commission in the East ten years ago as vice-president in charge of operating one of the important systems in Massachusetts. And now he has just been elected president of the New England Street Railway Club. R. B. Stearns, vice-president and general manager of the Eastern Massachusetts Street Railway, certainly is well known in New England and is recognized as an important influence in general utility enterprise.



R. B. Stearns

In the summer of 1917 he was elected senior vice-president in charge of operation of the Bay State Street Railway in Boston, to become in 1919 the Eastern Massachusetts Street Railway, relinquishing his position as vice-president of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. At that time P. F. Sullivan, president of the Bay State property, said that Mr. Stearns had been asked to join the Bay State because of the conspicuously successful work he had done in the West. In Milwaukee he had charge of a property with 400 miles of track, doing a business then in excess of $6,000,000 a year. In his six years of service with the Milwaukee company he had done a great deal toward rehabilitating and reconstructing the property. In addition he had started the Employees' Mutual Benefit Association and other employee benefit associations looking toward the development of the cooperative spirit.

Mr. Stearns' Early Work

Prior to his affiliation with the Milwaukee property, Mr. Stearns had been actively engaged in work in Chicago. He was employed in the construction of the Northwestern Elevated Railroad, the Union Loop and extensions to the Lake Street Elevated Railroad, Chicago, later known as the Chicago & Oak Park Elevated Railway, as assistant chief engineer and superintendent of construction. After that, he was appointed chief engineer and superintendent in charge of the operation of the Northwestern Elevated Railroad. At one time he was general manager of the Chicago & Milwaukee Electric Railroad.

Mr. Stearns was graduated from Purdue University, class of 1889. He was engineer in connection with the Columbian Exposition in Chicago in 1893, and subsequently was engaged in the United States Engineers Service on the Chicago drainage canal and the Hennepin Canal.

A decade ago, when Mr. Stearns went to Boston, the roads there were in a somewhat perilous state. What was needed, many felt, was a broad view of the railway question, followed by legislation to the end that electric railway investment might again become attractive to capital. The hope was expressed that Mr. Stearns' entry in New England would help the railway companies in the solution of their problems. He at the very beginning urged the railway companies to co-operate, and stressed particularly the assistance which the trainmen could give in explaining the needs of the railways to the public. He introduced the zone fare system on the Bay State lines.

Adolf Blunk Leaves St. Joseph

Adolf Blunk, associated with the St. Joseph Light, Heat & Power Company, St. Joseph, Mo., since November, 1925, and for the past year general superintendent of the railway department, was transferred recently to the Toledo Edison Company. His change is in the nature of a promotion, although his duties with the Toledo Edison have not been specified.

Mr. Blunk first worked for the Union Pacific Railroad in the maintenance of way department. Then he went to the Toledo Railway & Light Company, as junior engineer. It was at this time in his career that the war broke out and he entered the military, becoming first lieutenant in the army air service. After the armistice Mr. Blunk returned to the Doherty organization as railway engineer with the Durham Public Service Company, Durham, N. C. Then for a time he was with the Toledo & Western Railway, Sylvania, Ohio, as master mechanic, trainmaster and purchasing agent. His next post was with the Ohio Public Service Company, Mansfield, Ohio, as railway engineer and superintendent of the gas department. The Portsmouth Public Service Company, Portsmouth, Ohio, claimed him next, and from there, following a short stay in the New York office, he went to St. Joseph, taking the position as assistant general superintendent. In February, 1926, he was made general superintendent of the railway department. Mr. Blunk was educated at the University of Nebraska.

Niles Persons Goes to Brooklyn

Niles Persons, who for the past four years has been master mechanic of the Schenectady Railway, Schenectady, N. Y., has accepted a position with the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., with the title of superintendent of surface lines shops. In this capacity he will fill a new opening in the mechanical department, reporting to W. G. Gove, superintendent of equipment. The new position was made necessary on account of the rapid expansion of the system and the need for directing surface maintenance work as a complete unit separate from rapid transit work.

Niles Persons

Mr. Persons' first connection in electric railway work was in the armature department of the United Traction Company, Albany, where he remained for thirteen years as foreman, general foreman, assistant master mechanic and master mechanic. He has also been in charge of the mechanical department for the Hudson Valley Railway, Glens Falls; New York State Railways, Rochester; Gary & Interurban Railway, Gary, Ind., and the International Railway, Buffalo.

Mr. Persons was born in Albany in 1888. He was educated in the public schools of that city and at the State Normal School. He is a member of the New York Electric Railway Association, American Electric Railway Association and the Schenectady Chamber of Commerce.

Thomas Miller Promoted in Schenectady

Following the resignation of Niles Persons as master mechanic of the Schenectady Railway, Schenectady, N. Y., Thomas Miller, formerly assistant master mechanic, succeeds to the vacated post. Mr. Miller's present position will be filled by William Golden, long identified with the Schenectady Railway shops.

Mr. Miller's first experience with railway work was gained with the Quincy & Boston Railway as an electrical inspector. He was connected at one time with the Bay State Street Railway as foreman and general foreman and later served the New York, New Haven & Hartford Railroad as general foreman of electrical operation at Pemberton, Mass. Mr. Miller went to Schenectady in 1910 as general foreman of the McClellan Street carhouse and has since held positions as general foreman and assistant master mechanic. Mr. Miller was born in Preston, England, in 1879.

Oklahoma Association Elects E. R. Ernsberger

Earl R. Ernsberger of Oklahoma City, Okla., president of the Southwestern Light & Power Company, was elected president of the Oklahoma Utilities Association on March 9. For many years Mr. Ernsberger has been what is known as an electric light and power man, but he will be recalled to railway men as the former chief engineer and general manager of the Mount Hood Railway & Power Company, Portland, Ore. This was an electric railway and hydro-electric power development. Mr. Ernsberger went with this property just after the construction was started, and completed that work and operated the property until it was sold to the Portland Railway, Light & Power Company in 1913.

E. R. Ernsberger

This, however, was not his only railway connection, for in 1913 he went with the Charles City Western Railway, Charles City, Iowa, as vice-president and general manager. During Mr. Ernsberger's management the road was electrified, extended and put on a paying basis and operated as such until the time he severed his connection with it in January, 1922. It was from this property that he went in February, 1922, as president and general manager of the Southwestern Cities Electric Company, a holding organization for the Lawton & Duncan Electric Company, Mangum Electric Company and the Lawton Gas Company in Oklahoma, and the Quanax Light & Ice Company, operating in Texas, also the Pecos Valley Gas & Electric Company in New Mexico. These are all properties now included in the Southwestern Light & Power Company. He is also president and general manager of the Keyes Corporation, owning and operating oil and gas fields at Walters, Okla.

Mr. Ernsberger's experience has covered a wide range of engineering activity. The project at Portland, Ore., to which reference has been made before, consisted of the 20,000-hp. hydro-electric plant at Bull Run, with a 500-ft. head. The work there included the building of 3 miles of tunnel conveying the water from one river to another, 5 miles of flume with a 280-acre reservoir reserve with two auxiliary steam plants in Portland, 66,000-volt high-tension transmission lines and a 20-mile railway which had to be built before the machinery could be transported to the power plant site and installed.

Mr. Ernsberger is a graduate civil engineer. His first experience after leaving school was with the Pennsylvania Railroad in the engineering department with headquarters at Pittsburgh. He left that company to accept a position as assistant to the chief engineer of the Wheeling & Lake Erie Railroad, Cleveland, Ohio, but later became engineer and superintendent of track elevation for the Chicago, Milwaukee & St. Paul Railway in Chicago. This last position he held for eight years, during which time several million dollars worth of construction work was done under his direction each year. As a part of his work at Chicago Mr. Ernsberger helped supervise the electrification of the Northwestern Elevated Railroad from Wilson Avenue to the Central Street Station in Evanston, Ill.

Mr. Ernsberger was a pioneer among utility men with engineering training who recognized the value of good public relations. The very nature of his work has compelled him to be exact in his dealings, but the practice of the Golden Rule has been his motto, with the result that he has found in all cases that the public in turn has treated the property which he represented as it would like to be treated.

Changes at International Annual Meeting

T. E. Mitten was elected chairman of the board of directors of the International Railway and J. A. Queeney chairman of the executive committee at the annual meeting of the board of directors, held on March 28. Dr. A. A. Mitten, son of Mr. Mitten, was added to the executive committee, the other members being Mr. Queeney and President B. J. Yungbluth. Mr. Queeney becomes vice-chairman of the board.

Harold P. Lesswing was elected a director of the company, taking the place of George L. Burgain, retiring president of the I. R. Co-operative Association. Mr. Lesswing is the newly elected vice-president of that association. He was born in Tonawanda, N. Y., and has been employed by the company continuously since April, 1916. His first job was as helper in a construction gang. He is now an electrician.

The complete list of directors elected by the stockholders includes T. E. Mitten, J. A. Queeney, C. J. Joyce, Harold P. Lesswing, Dr. A. A. Mitten, W. E. Murphy, Nelson Robinson, H. G. Tulley and B. J. Yungbluth.

G. W. Welsh Heads Illinois Association

G. W. Welsh, vice-president of the East St. Louis & Suburban Railway, East St. Louis, Ill., was elected president of the Illinois Electric Railways Association at the meeting in Springfield, March 17. A little more than a year ago, when W. H. Sawyer, president, departed for Australia for the purpose of making the electrical survey, Mr. Welsh was elected vice-president of the East St. Louis Railway, which included the East St. Louis & Suburban Railway and the St. Louis & Belleville Electric Railway. Before that promotion Mr. Welsh had been assistant to the president of all the railway companies in the group.

G. W. Welsh

It was in 1914 that Mr. Welsh became connected with the East St. Louis & Suburban group of properties in East St. Louis as superintendent of power. He continued in that position until 1919, when he was made chief engineer. He has been identified with the General Electric Company, the New York Central Railroad, the Southern Pacific Company at San Francisco, where he was interested in electrification work, as he was on the New York Central. Mr. Welsh was educated at Lehigh University, where he was graduated with a degree of electrical engineer in 1901.

Obituary

Albert Ball

Albert Ball, chief mechanical engineer of the Sullivan Machinery Company for nearly 50 years, died at his home in Claremont, N. H., on Feb. 7, at the age of 91 years and nine months. Mr. Ball was born in Boylston, Mass., on May 7, 1835. His schooling ended at the age of 16 years, when he became a machine shop apprentice. His first employment was with L. W. Pond at

Worcester, Mass. In 1863 he brought out his first important invention, a combined repeating and single loading rifle, and in the same year he perfected a machine for polishing flat surfaces. Mr. Ball was sought out by E. G. Lamson, of the firm of Lamson, Goodnow & Yale, manufacturer of the Ball gun, many of which were sold in Germany and used by the Prussian army in the war against Austria.

It was while Mr. Ball was with the Windsor firm that he invented the first cartridge greasing machine, an indirect outcome of his visit to the Springfield, Mass., arsenal for the purpose of discussing contracts for the Ball rifle. Mr. Ball went to Claremont in May, 1868, to become affiliated with the J. P. Upham & Company machine shop, which later became the Sullivan Machinery Company. It was after he became associated with the Sullivan Machinery Company that his full power as an inventor was attained. Beginning in 1869 with the diamond channeler and gadder, his genius was responsible for the development of many important improvements in mining and quarrying machinery.

Development of the Sullivan diamond core drill brought to Mr. Ball a lasting fame, and the romantic history of the opening up of the rich gold fields in the South African Transvaal is closely linked with the history of Mr. Ball's diamond drills. Mr. Ball's inventions during his life in Claremont were not limited to mining machinery.

Following his retirement from the Sullivan company in 1914, Mr. Ball turned his time and efforts to an avocation in which he had taken great interest, namely, the making of violins. He produced many instruments of beautiful design, praised by experts for their tone and finish, and developed special machinery for executing unique wood patterns. He continued active until his last illness.

Edward C. Niles, former chairman of the New Hampshire State Public Service Commission, reporter of Supreme Court decisions and special counsel for New Hampshire in its railroad cases, died in Concord on Feb. 16. He was born in Hartford, Conn., on March 28, 1865.

Fred W. Reitz, for many years president of the Evansville Traction Company, which later became the Evansville & Ohio Valley Railway, Evansville, Ind., died recently. The Evansville & Ohio Valley Railway operates from Evansville west to Mount Vernon, east to Rockport and Grandview and south to Henderson, Ky. Mr. Reitz was 69 years old.

Charles H. Alexander, pioneer electric railway man of Texas, died at his home in Dallas on March 21. Mr. Alexander retired from business several years ago. He went to Dallas in 1888 from Tennessee and organized the Standard Light & Power Company and the Dallas Consolidated Street Railway. In the organization of the street railway he consolidated and electrified the lines in Dallas. His property was the first electric railway in that part of the state of Texas. Mr. Alexander was 68 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Best Year for General Electric

Selling Prices Up Only 13 Per Cent Despite 54 Per Cent Advance in Commodity Prices

Sales billed by the General Electric Company in 1926 amounted to $326,974,104, compared with $290,290,166 in 1925, an increase of more than $36,000,000. The best previous high record was in 1924, when sales totaled $299,251,869. Orders received during 1926 aggregated $327,400,207, an increase of 8 per cent over 1925. The previous high record was $318,470,438 in 1920.

Profit available for dividends on the common stock on the 1926 business was $44,314,884, equivalent to $6.14 a share on the 7,211,481 shares of no par value stock outstanding, as compared with $20.49 a share in 1925 on the 1,802,870 shares of $100 par value common stock then outstanding, which is equivalent to $5.12 per share on the present stock. In August, 1926, four shares of no par value common stock were issued in exchange for each share of the old common stock.

COMPARATIVE STATEMENT OF INCOME AND EXPENSES OF THE GENERAL ELECTRIC COMPANY

	1926	1925
Net sales billed..........	$326,974,103	$290,290,165
Less: Cost of sales billed, including operating, maintenance and depreciation charges, reserves and provision for all taxes..............	289,878,335	257,479,490
Net income from sales..	$37,095,768	$32,810,675
Income from other sources:		
Income from associated companies..........	$4,937,901	$3,411,292
Income from miscellaneous securities......	915,835	751,142
Interest and discount..	3,047,048	2,838,513
Income from U. S. government securities...	2,647,502	2,394,398
Royalties and sundry revenue............	1,013,238	964,720
	$12,561,526	$10,360,067
Total income........	$49,657,294	$43,170,743
Less: All interest payments and, in 1925, premium on debentures retired..............	$436,511	$1,925,696
Addition to general reserve..............	2,548,284	2,603,828
	$2,984,796	$4,529,525
Profit available for dividends...............	$46,672,498	$38,641,217
Less: 6 per cent cash dividends on special stock..	2,357,614	1,735,576
Profit available for dividends on common stock	$44,314,884	$36,905,641
Less: Cash dividends on common stock*........	19,828,896	14,407,544
Surplus for the year......	$24,485,987	$22,498,097
Surplus at January 1.....	85,848,170	72,362,223
	$110,334,158	$94,860,320
Less: Dividends paid in special stock: $1 per share in 1926 (equivalent to $4 per share on old $100 par value stock) and $5 per share in 1925	7,210,810	9,012,150
Surplus at Dec. 31......	$103,123,348	$85,848,170

* At the rate of $8 per share on old $100 par value stock in 1925 and first half of 1926 and at the rate of $3 per share on new no par value stock (equivalent to $12 per share on old stock) in last half of 1926.

This split-up of shares is reflected in an increase in the number of stockholders from 36,697 in December, 1925, to 46,305 in December, 1926. More than 98 per cent of the stock is held in the United States and nearly half of the stockholders are women. Every state in the Union is represented in the list of stockholders.

A striking illustration of the company's contribution to the benefit of the consuming public and of its employees is contained in a statement showing that during the past twelve years, while commodity prices have advanced 54 per cent and the cost of living has risen 68 per cent, General Electric selling prices have increased only 13 per cent and the average earnings of the company's employees have more than doubled.

The export business of the company is conducted by the International General Electric Company, Inc. Those portions of its orders and billing which were for General Electric products are included in the corresponding figures of the General Electric Company at their cost to the International Company. The total of all orders received by the International Company during the year was $20,824,000, compared with $25,710,000 during 1925. The net sales billed were $22,696,577 during 1926, compared with $21,981,951 for 1925. The International Company's business yielded a profit available for dividends of $1,538,306 compared with $2,617,204 in 1925. Dividends of $1,500,000 were paid during 1926, of which the General Electric Company received $1,375,772, which is included in the financial statement as part of "income from associated companies."

Large Bus Shops Proposed at Newark

For purposes of efficiency and economy Public Service Transportation Company, Newark, N. J., will erect a large bus repair shop and remodel the present storage building on the south side of Ferry Street west of and adjoining the Newark railway repair shops. It is intended to make this shop the major repair and overhauling headquarters for all the buses operated by the company in the state.

The proximity of the bus repair shop to the railway shops is expected materially to reduce the time heretofore taken to overhaul buses, as it will be possible to make chassis and body repairs simultaneously by utilizing the facilities of both shops. Another advantage will result from placing the two main storerooms adjacent to each other, as economies can be effected by the delivery of railway and bus supplies to the point of common activity.

All chassis and engine work will be done in the new bus shop and the electrical work, carpenter work and painting, together with spring, radiator and sheet metal work on the buses will continue to be done in the railway shops.

The bus shop will be thoroughly equipped with the latest models of machinery, making it possible to perform any major overhauling job at this point. All minor repairs to buses will continue to be made at the smaller garages in various parts of the territory.

The new bus shop will be 318 ft. long, 102 ft. wide and 26 ft. high, sufficient to accommodate double-deck buses if necessary. The roof will be of glass of special sawtooth design, constructed so that light from the north will be reflected into the working space beneath. The storeroom will be two stories.

Trends in the Metal Markets

BUYERS of the non-ferrous metals have for the most part not responded during the week ended March 30 even when producers were willing to shade prices. Demand for copper has been slightly better than last week, but this is all that can be said for it; demand for zinc subsided and lead and tin show little change so far as volume of business is concerned.

Copper was generally available for Eastern deliveries at 13¼ cents on Thursday, Friday and Saturday, but as early as Friday reports of 13⅛ cents seem to be well authenticated. By Monday the market was generally quoted at 13⅛ cents and that price ruled on business placed March 29 and 30. The copper sold at 13.05 cents was a resale offering. In the Middle West as low as 13.20 cents, delivered, has been done. The volume of business was somewhat greater than last week, but is still much below normal. The total of March sales will be the lowest in months, so the prospect of a good buying wave in the coming week, or possibly in the week after next, seems excellent. The large producers have so far consistently refrained from forcing copper on the market, the depression in price being attributable to the custom smelters, who make a policy of selling current intake. Following recent sales, they are, perhaps, in somewhat improved position. The copper sold has been pretty well distributed. Sheet and tube business is reported active, and brass business good. Wire continues to be the dullest line. Copper prices abroad were reduced on March 29 by the export association from 13.65 to 13½ cents, c.i.f.; there, too, the week has been dull.

The *Engineering and Mining Journal* says that an unusual situation exists in the lead market. The peculiarity lies in the fact that the present dip has taken the price lower than the bottom reached at the end of the long decline, a condition that has not existed for many years. The market is quite clearly in the hands of buyers, and sellers are competing for business. In New York, the limited amount of "outside business" has virtually all been at the Smelting company's price. In the Middle West second-hands have been inclined to undersell the principal interests, some lead being available on March 30 as low as 7.05 cents. Absence of buying in volume by battery makers is an important feature in the situation.

Demands for zinc from galvanizers have been few and sellers have been obliged to make concessions in price. The volume of sales has been smaller than for several weeks. Prompt zinc has been offered for somewhat less than forward. On March 29, for example, early deliveries were available at 6.525 cents without being taken up, whereas a good tonnage for forward delivery sold at 6.55 cents. On March 30 the market was much the same, though some zinc was reported having been offered as low as 6½ cents. Some increase in ore production is reported from the Tri-State district, but smelter production is probably 8 or 10 per cent less than it was a month ago. High-grade metal continues dull at 8½ cents delivered in the East.

Tin has been quiet during the week, with prices fluctuating within narrow limits in the domestic market. An advance in London on March 30 was reflected in some improvement in the domestic market from a quotational standpoint. Future delivery is at a discount of from 1⅝ cents to 2 cents; and 99 per cent, for prompt delivery, commands about a cent less than Straits.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	March 29, 1927
Copper, electrolytic, cents per lb	12.90
Copper wire, cents per lb	15.25
Lead, cents per lb	7.32
Zinc, cents per lb	6.88
Tin, Straits, cents per lb	68.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	2.25
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.70
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.69

H. M. Robinson a General Electric Director

Henry M. Robinson, president of the First National Bank of Los Angeles, was elected a director of the General Electric Company at the meeting of the board in New York on March 25. In addition to his position with the First National Bank, Mr. Robinson is president of the First Securities Company, chairman of the board of the Pacific Southwest Trust & Savings Bank, and a director in a number of other large corporations. This is the first time the General Electric Company has gone to the West for a member of its board.

Terms of Purchase of Seattle Cars Under Discussion Again

Negotiations for the purchase of 80 new cars for the Seattle Municipal Railway, Seattle, Wash., are being pushed by Seattle city officials. Only one or two details are yet to be worked out with the St. Louis Car Company, awarded the contract some time ago. A bond issue of $1,875,000 has been voted for the purchase, of which $1,420,000 will go for the cars and the rest for financing track extensions in various parts of the city and for a railway trestle over the West Duwamish waterway.

The car builder desires that there be included in the purchase contract, before the company signs it, a clause making a separate fund of the money to retire the bonds for buying the cars. Its desire is to be reassured that money put aside for the retirement of the bonds will be used for that purpose only. The Council sees no objection to this clause and is ready to include it in the contract as soon as the company which has agreed tentatively to buy the bonds is ready to take them. Operation of the new cars is expected to effect a saving of $260,000 a year.

Mazda Price Cut Again

Effective on April 1, announcement is made by the General Electric Company of another reduction in the prices of Mazda incandescent lamps. This is the third reduction in prices since the new inside-frosted lamps were introduced in 1926. The reduction lowers the price of 25 and 40-watt lamps to 23 cents each, the 50 and 60-watt sizes to 25 cents each and the average price of all Mazda lamps to 49.4 per cent less than in 1914.

"This reduction is made possible by the elimination of waste through the abandoning of about 45 types of lamps and the universal acceptance of the six new types of inside frosted bulbs," the announcement said in part. "The old type of outside frosted lamp, which absorbed approximately 20 per cent of the light and collected considerable dust and dirt with the rough surfaces, sold for approximately three times as much as the new inside frosted lamp."

Great Northern Railway Electrification Progressing

The 7,500-kva. frequency changer at Skykomish, Wash., which will supply part of the current used by the electrified Great Northern Railway has been installed, ready to supply 11,000-volt, 25-cycle, single-phase current to the overhead lines which are now being erected. A similar frequency changer is also to be located at Tumwater. Installation of the equipment for the electrification of the railroad over the Cascade Mountains is progressing rapidly, and train operation with electric locomotives is predicted in the near future.

Two single-phase, motor-generator type locomotives, each weighing 250 tons and being the largest single-unit electric freight locomotives ever built, will be placed in operation this summer. These, as well as the frequency changers, are being supplied by the General Electric Company. The American Locomotive Company has the contract for the mechanical parts of the locomotives.

Power will be supplied to the substations by the Puget Sound Power & Light Company.

Slingluff Goes to Kuhlman Car Company

Eugene Slingluff, well known in the car building industry, has resigned his position with the Cincinnati Car Company to accept the post of general superintendent with the Kuhlman Car Company, Cleveland, Ohio. Mr. Slingluff commenced his career in 1895 with the Baltimore Traction Company in the electrical department. The following year he went to the Westinghouse Electric & Manufacturing Company in its construction department, and a year later was connected with the mechanical department of the Washington Railway & Electric Company. He remained with that company up to 1903, when he accepted a position with the Cincinnati Traction Company, remaining in its employ until 1914. While there he was superintendent of carhouses and superintendent of shops and equipment. Mr. Slingluff went with the Cincinnati Car Company in 1914.

Rolling Stock

Monongahela West Penn Public Service Company, Parkersburg, W. Va., has in contemplation a program of improvements which includes among its items the purchase of eighteen cars and a quantity of buses, the number of which is still to be fixed.

Yellow Cab Company, recently taken over by the Twin City Rapid Transit Company, Minneapolis, Minn., has bought 25 cabs at a cost of $50,000.

Portland Electric Power Company, Portland, Ore., has received all of the eight pay-as-you-enter type buses to be used on the new Ross Island bridge line. The total cost of the buses was $90,000. Seven of them are of the Yellow Truck & Coach Company make and one is a Mack.

Track and Line

Interborough Rapid Transit Company, New York, N. Y., has agreed to proceed at once with the signaling of the elevated tracks on the Astoria and Corona lines in Queens. Frank Hedley, president and general manager of the Interborough, has already directed the preparation of the specifications. Mr. Hedley proposed to make experiments with the automatic block signals on the Third Avenue elevated before installing them on the Queens lines. The Transit Commission's engineers pointed out, however, that no such intensity of traffic exists on the Queens lines as on the Third Avenue "L" and that the present system of signaling which is used on the express tracks of the subway and elevated lines would handle the present traffic on the Queens lines. It has been estimated that the signaling installation will cost in the neighborhood of $690,000 for the local tracks on the Astoria and Corona lines.

Shops and Buildings

Alabama Power Company, Birmingham, Ala., is making extensive improvements to its substation at West Huntsville, Ala. The new work involves an expenditure of $10,000.

Public Service Production Company, which is a subsidiary of Public Service, Newark, N. J., has nearly completed a new bus garage in Union and Gamewell Streets, Hackensack, N. J. The new structure will have a capacity of 40 buses and is already housing rolling stock of the Newark-Hackensack, Hackensack-Little River Ferry, and Hackensack - Rutherford lines. The garage is built of brick and steel with art stone trim, and it has a frontage of about 204 ft. on Union Street, and 91 ft. on Gamewell Street. Inside clearance is 12 ft. from concrete floor to roof tie rods. Roof construction is of the "amellas" type, consisting of a dome-shaped arch made of wood units so assembled as to give the appearance of an immense inverted fishnet. This type of roof construction does away with all interior columns and roof trusses and has been extensively used in Germany.

Rockford Public Service Company, Rockford, Ill., has announced plans for the construction of a two-story brick and concrete car and bus storage barn over the storage tracks on Kishwaukee Street, adjacent to the present carhouses. Ramps and elevators will lift the buses to the second floor.

Trade Notes

Howard E. Oberg has been put in charge of sales engineering in the Middle West by the Billings & Spencer Company, Hartford, Conn. Mr. Oberg's office will be located in Room 5-251, General Motors Building, Detroit, Mich.

Nichols-Lintern Company, Cleveland, Ohio, announces that it is now prepared to furnish the N-L bus heater, which has been under development in practical service.

O. J. Neslage of the St. Louis office sales staff of the Sullivan Machinery Company, for several years past located in the Joplin, Mo., lead and zinc district, has been appointed local manager at Mexico City, Edificio Oliver No. 3. A. W. Oakes, for several years past manager at Mexico City, has been assigned to a post in the United States. C. W. Miller has been appointed special representative of the Sullivan Machinery Company in Cuba and will cooperate with the company's general agents for Cuba, the Purdy & Henderson Trading Company, Habana 55, asquina a Empedrado, Havana, Cuba. Matt Brodie, manager for Asia of the Sullivan Machinery Company, has sailed from San Francisco for Tokyo, following a three months furlough in this country.

Trico Fuse Manufacturing Company. Milwaukee, Wis., manufacturers of Trico renewable fuses, announces the following staff appointments: B. M. Slicting as sales promotion manager, in charge of the company's main office in Milwaukee; J. E. Eldredge of South Windsor, Conn., sales representative for the state of Connecticut and western part of Massachusetts; Arthur E. Bacon, Denver, Col., sales representative for the states of Colorado, New Mexico, Utah and Wyoming.

Haskelite Manufacturing Corporation, Chicago, Ill., reports that so far this year its products Haskelite and Plymetl are being used in the construction of street cars for the following utilities: Gary Street Railways, Gary Ind.; Municipal Railways, San Francisco, Cal.; Grand Rapids Railway, Grand Rapids, Mich.; West Penn Power Company, Connellsville, Pa.; Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio; Virginia Electric & Power Company, Richmond, Va.; Eastern New York Utilities Corporation, Albany, N. Y.; Cincinnati Street Railway, Cincinnati, Ohio; Union Traction Company, Anderson, Ind., and Eastern Massachusetts Street Railway, Boston.

New Advertising Literature

International Steel Tie Company, Cleveland, Ohio, has just issued a handsome calendar for March, April and May, 1927, which has as its decorative feature a colored print of the Rue de Rivoli, Paris.

Condit Electrical Manufacturing Corporation, Boston, Mass., is issuing a descriptive folder of its type D-15C oil circuit breaker. The interrupted capacity of this device is 2,700 amp. at 15,000 volts.

Mitchell-Rand Manufacturing Company, New York City, N. Y., through a circular, announces that it has dissolved its associations with outside mills and is now producing its own line of material under the trademark "Shield Brand." Tapes and webbings are the company's principal products.

Baker-Raulang Company, Cleveland, Ohio, is issuing several new booklets describing bus bodies. No. 105 gives complete specifications for bus bodies adapted to the White chassis models 53 and 18 with a 212-in. wheelbase. Bulletin 106 details bodies for the same chassis models 50-B and 54, while bulletin No. 107 illustrates the bodies mounted on White chassis, special attention being paid to their application to models 50-B, 53 and 54.

A. Gilbert & Sons Brass Foundry Company, St. Louis, Mo., manufacturer of armatures, axle bearings, trolley wheels, solder and line material, is sending out a series of sales letters to the mechanical and purchasing departments of the electric railways. Each letter deals with an individual subject, explaining how the Gilbert company came to adopt the standard composition used. The letters are designed to assist the mechanical departments in adopting standards for their roads, whether it be the Gilbert standard or some other.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 | New York, Saturday, April 9, 1927 | *Number* 15

Exhibits to Open on Saturday at This Year's Cleveland Convention

WITH the approval of the executive committee an important departure from the practice followed at former annual conventions has been inaugurated by this year's exhibit committee of the American Electric Railway Association. Exhibits will be set up, manned and opened for inspection at noon on Saturday, Oct. 1. Delegates who arrive early will have an oppportunity to inspect exhibits Saturday afternoon and Sunday, before the opening of the convention on Monday. This is in addition to Wednesday of convention week, which, as in former years, has been set aside for visiting exhibits.

An important forward step has been taken. As the convention has grown rapidly in size it has become increasingly difficult for railway men in attendance to view the exhibits thoroughly without neglecting the business sessions. When the practice was started several years ago of setting aside one full day to inspect the exhibits a considerable improvement was made. The new plan of opening them on Saturday is another move in the right direction.

Time spent among the exhibits at the convention is time well invested. Many thousands of dollars are expended each year by manufacturers to bring their equipment to the convention for inspection by operating men. The cost to operating companies for sending executives and employees to the convention is likewise heavy. Unless adequate time is available for thorough examination of manufacturers' products and for attendance at the convention sessions, full value is not derived by the industry from these expenditures.

Of course, the new arrangement will not be productive of improved results unless operating men take advantage of it by getting to Cleveland on Saturday or Sunday. Only through the co-operation of railway executives can this be assured. Get your men to Cleveland early! See to it that they go over the exhibits thoroughly! The time and effort put in will be more than amply repaid in new ideas and new enthusiasm.

A Big Step in Weight Reduction

ENTIRELY new possibilities in car design are opened up by the success which has so far marked the operation of the experimental aluminum car built by the Cleveland Railway and exhibited at the convention last fall. By the use of aluminum alloys as presented in an article elsewhere in this issue, the weight of a large city car more than 51 ft. long and equipped with four motors has been reduced to only slightly more than 30,000 lb. That is indeed light weight with a vengeance! The car was built entirely as an experiment. But after more than four months operation under the severe conditions encountered in Cleveland, it has developed no structural weaknesses.

Before attempting to draw conclusions from the Cleveland experiment it should be understood that this car was designed for steel and not for aluminum construction. When the railway decided to build an aluminum car for exhibit at the convention, time did not permit much more than merely the substitution of aluminum for steel, part for part. It seems reasonable to assume, therefore, that a car designed originally for aluminum would permit more scientific utilization of the lightweight material.

Cleveland has without doubt pioneered a most important experiment. There seems ample reason to look forward to a more general use of aluminum for car construction in the near future. If this becomes practicable, an attractive reduction in operating costs would result from the very large saving in weight that can be made.

Facts in Annual Reports Are Encouraging

OPTIMISM does not exude from the pages of the annual reports of the electric railways for 1926 so far received for digest by the JOURNAL, but it is not difficult to find very encouraging signs in them. Everything considered, the best all-around showing, perhaps, is contained in the statement of the Chicago Surface Lines. That property carried not only the largest number of passengers in its history but made its best financial showing in any year except one. This may be attributed to the determination of the management to carry on just as it had in the past, no matter what the outcome of the franchise negotiations.

One thing that stands out as most heartening is the tendency shown in practically all of the reports toward no lessening in the number of passengers carried. This is true, as before mentioned, of Chicago, and is true in lesser degree in the case of the companies in Cincinnati, Milwaukee and other cities. A striking fact of the Philadelphia report was that the number of passengers carried per trainman in that city increased from 72,405 in 1911 to 151,175 in 1926. Rides per capita in Philadelphia have increased from 329 in 1911 to 480 in 1926.

Not only this, but the reports reflect the good work that is being done in accident prevention. The Louisville Railway's accidents have been reduced from 3,272 in 1922 to 1,157 in 1926, and the number of miles operated per accident has been increased from 3,323 in 1922 to 10,386 in 1926. On the Market Street Railway of San Francisco expenses incident to injuries and damages in 1926 were 30.18 per cent less than in 1925. Statistics indicate that collision accidents per car-mile in San Francisco were reduced 26 per cent.

Both the Market Street Railway and the West Penn

Railways gave important facts in the annual reports about the work being done toward strengthening their financial positions. The conditions surrounding the Market Street Railway are in many respects peculiar, but despite the low fare at which the company is required to operate and other unfavorable conditions, the funded debt in the hands of the public was reduced $634,000 during the year. The West Penn Railways retired $5,548,500 of funded obligations. On Sept. 1, 1926, the company called and retired all of its outstanding three-year 6½ per cent gold debentures due April 1, 1927, aggregating $3,500,000, funds having been made available to its treasury through reimbursements by certain subsidiary companies to which temporary advances had previously been made for construction. In addition, all of the company's outstanding first equipment trust 8 per cent notes of 1921, aggregating $120,000 were retired on Oct. 1, 1926.

The number of reports available in pamphlet form for digest is not so very large and the method of presentation of the data contained in them is so dissimilar that a basis of real comparison between companies is not afforded even if it were deemed advisable, but the conclusion is inescapable from the digests of the reports so far presented that the managements are for the most part thoroughly alive to the opportunity which is presented for the intelligent and determined application of ideas that give promise of furthering the interests of the companies themselves and of constantly increasing the essentiality of the properties to the welfare of the people in the communities in which they operate.

Revival of Brady Award Should Stimulate Safety Work

CONSIDERABLE interest attaches to the announcement just made that the Anthony N. Brady safety award has been revived after remaining dormant since it was awarded to the Connecticut Company in 1916. The American Museum of Safety has taken charge of the contest and the next award of the medals will be for the calendar year 1926.

The conditions have been revised materially. Formerly a rather complicated series of computations was necessary to determine the winner, and the procedure made it difficult for the smaller companies to present their claims. Under the new conditions there will be three medals as before, but they will be given as first prizes to operating companies in three classes, grouped according to the number of vehicle-miles operated. The method of presentation has been modified greatly so that it will be possible for all electric railways, large or small, to present their own cases in the way that will bring out the best consideration of their records and the conditions under which their accomplishments have been made.

The plan under which the contest is to be conducted contemplates the preparation of a brief by each contestant presenting the accomplishments in gaining good will, improvements in maintenance and operating practices and promotion of sanitation and health, as a result of better safety practices. This will permit great latitude in presentations and will allow the committee in charge of the award to judge the work by a definite system of rating each of the six factors outlined in the conditions of the contest. The committee will also take into consideration any other factors or conditions which may in its judgment have a bearing on the relative accomplishments of the contestants in the field of safety.

It is desirable that as many railways as possible enter the competition. The conditions are not onerous and the amount of work that must be done in preparing the presentations should not be a hardship to any company. Separation of the companies into three groups, depending on size, gives the smaller companies an equal chance with the larger ones.

I.C.C. Split on Valuation Issue

COMMENT has been provoked in railroad and financial circles by the majority opinion of the Interstate Commerce Commission in the so-called St. Louis & O'Fallon Railroad valuation case, one in which the principles involve railroad properties valued at billions. It is the first decision of the commission interpreting and applying the so-called recapture clause of the transportation act of 1920. By a vote of six to four, the commission held, in effect, that the value of the property of a railroad for rate-making purposes, as determined by the commission for 1914, approaches more nearly the reasonable and necessary investment in the property than the cost of reproduction of it. The recapture clause provides for the payment to the federal government of one-half of the net railway operating income of a railway system in excess of 6 per cent on its value for any year following the passage of the act. No definite rule of valuation was laid down in the transportation act of 1920. So the commission proceeded on its own initiative.

The majority opinion held that Congress intended to fix values of railroad properties for recapture purposes without awaiting completion of final valuation under the provisions of the valuation act. It also held that, for that purpose, it is warranted in basing its valuation on its tentative valuation figures of 1919 (based on 1914 unit prices) as far as available, plus net additions to property in succeeding years at actual cost, less depreciation, without giving effect to the cost of reproducing the original property at present-day prices.

According to one of the commentators who summarized the long decision, the majority opinion admitted that the "cost of reproduction now at prices current on valuation date" had been laid down as a rule in previous court decisions, but it objected that such a basis of rate making would prevent stability of rates; that in 1920, for instance, valuation at current prices would have required increase of 114.64 per cent in "the element of rates and charges" over the requirements as of 1914, in order to insure the "fair percentage" of return, whereas in 1921 there would have been a reduction of 14.38 per cent, and in 1922 a further reduction of 18.23 per cent. This the majority opinion deemed unjust and unworkable, and between that method and the use of 1914 prices as a base, no intermediate process was "possible which is capable of being applied to any rule independent of the caprice of those who apply it."

It might seem offhand that this case is without interest in the electric railway and utility field, but that is not a fact. In the first place, the commission, as indicated previously, was divided on the basis of a six to four vote, and in the second place the minority opinion rested its conclusion squarely on the "law of the land" as embodied in previous Supreme Court decisions. The minority cited particularly one earlier leading decision, which acclaimed that, in valuing property used in serving the general public, consideration should be given to "present as compared with original cost of construction." Reaffirmation of this principle in the Minnesota rate case was further cited, also the Supreme Court's reversal of a lower court's decision in a public utility value, on the ground that the lower court had failed to accord "any weight to the greatly enhanced cost of material, labor, supplies, etc., over those prevailing in 1913, 1914 and 1916." The minority opinion bluntly declares that the commission's majority "refuse to follow" these clearly enunciated and definitely established principles. The basic use of 1914 prices is not challenged, but there is strong dissent from using them "in determining value in 1923 without application of corrective factors." The minority concludes that "if the law needs change, let those who made it change it. Our duty is to apply the law as it stands."

So the grounds become plain on which the radical divergence of opinion is based. They indicate clearly that the final and proper course of the commission cannot be determined except by the Supreme Court itself. In this respect it is quite clear that the issues were treated as test cases as to the method of ascertaining the value of roads for recapture purposes. The majority recognized that "having in mind the whole railroad situation, the decision is of the greatest consequence from the public and the private viewpoints." Both on that account and on account of the stand which the majority and the minority took in the matter, the case, despite the peculiarities of the terms of the transportation act, are of interest even to those who at first appear to be only remotely concerned with valuation problems.

Those Who Came to Scoff Remained to Ponder

SKEPTICS who think that accidents are an inevitable accompaniment to electric railway operation certainly would have experienced a change of heart had they attended the April meeting of the Metropolitan Section, American Electric Railway Association, reported in this issue. Representatives of three important electric railways gave definite figures showing what had been accomplished by sustained effort on their properties. Since the beginning of an organized safety campaign on the Third Avenue Railway, New York City, fifteen months ago, the number of accidents has been approximately 1,400 less than during the preceding fifteen months. The total number of accidents on the Brooklyn City Railroad during the past eight months was 8,275 as compared with 9,518 occurring during a like period before the inauguration of the present bonus plan. In Louisville, where formerly one accident occurred for every 1,800 car-miles operated, the January, 1927, ratio was one per 19,000 car-miles. Claims paid by the Louisville Railway have been reduced from 7½ per cent of the gross revenue to 4 per cent. Evidence more convincing than these figures could hardly be found to show that the efforts made in accident prevention are thoroughly worth while from an economic standpoint.

While admitting that safety work was first undertaken for economic reasons, James P. Barnes, president Louisville Railway, pointed out that the humanitarian motive is now paramount. Much as his company has accomplished in the way of financial saving, he feels that the saving of life and limb has been of far greater importance. Moreover, united work in accident prevention has created a closer bond between the employee and the officials of the railway. Truly, in the case of this meeting it might be said that those who came to scoff, if any such there were, remained to ponder upon the substantial benefits resulting from organized safety work.

Safety Platforms an Aid to Movement of All Traffic

TO THE prospective passenger waiting for a street car in the midst of a stream of rapidly moving vehicular traffic a raised loading platform is a great boon. Use of such safety platforms in most of the large cities of this country undoubtedly has prevented a great number of accidents. For this reason alone the moderate cost of construction is more than justified.

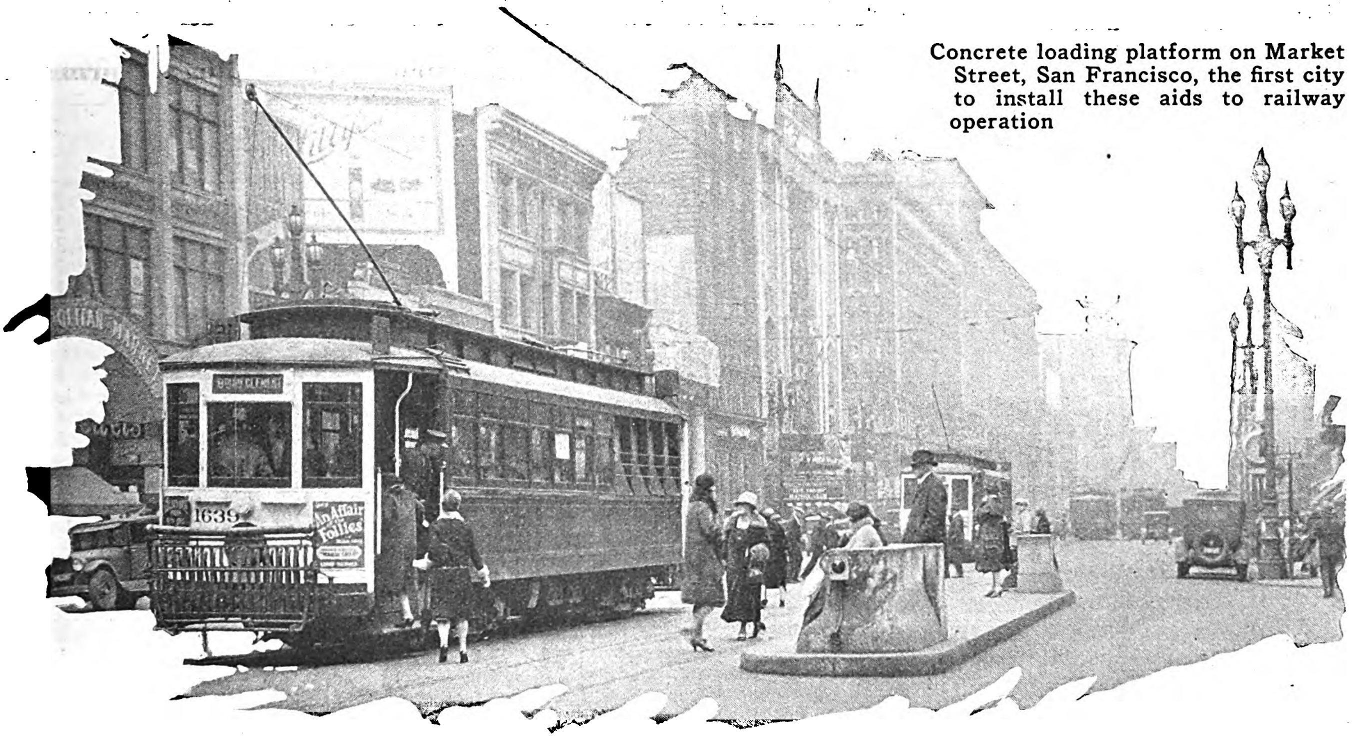
But the safety platform is more than a means of preventing accidents. It is a definite aid to the movement of all traffic. A nation-wide survey made by ELECTRIC RAILWAY JOURNAL, presented elsewhere in this issue, shows that executives of railway companies in cities where platforms are used are practically unanimous in the opinion that they speed up the operation of both cars and other vehicles.

Where loading platforms are used passengers are ready to board the car immediately it comes to a stop. Otherwise many of them wait on the sidewalk and make their way from the curb to the center of the street while the car waits. Moreover, stop-watch checks show that it takes less time for a passenger to board a car from a platform than from the street. Thus, there is a double saving of time, which in the aggregate amounts to many car-hours per day.

Vehicles other than cars should not be allowed to operate on the tracks inside the platforms. Otherwise cars are unable to draw up alongside the platform to their proper position, and one of the chief advantages of the platform is lost. The survey shows that the importance of this regulation is realized in most cities, although a few permit this harmful practice.

Loading platforms facilitate movement of other vehicles nearly as much as that of street cars. Most prospective car riders make their way from the sidewalk to the safety platform while the traffic is halted. Thus when the traffic is moving, greater speed can be attained with equal safety because of the small likelihood of pedestrians dashing out from the curb to reach the car tracks. Passengers alighting from cars have a safe place to stand and it is unnecessary for motor traffic to stop every time the car stops. All this has an important effect in relieving congestion where traffic is dense.

No uniform practice was disclosed by the survey in regard to paying for the construction of safety platforms. In some cities the railway has paid the cost, but in most instances this has been done by the municipality. As the platforms are built on public property and benefit not only the car riders but also the motorists, their construction appears to be a reasonable municipal expense. So favorable has been the experience of cities where these platforms have been used that municipal officials who understand their advantages should be quite willing to authorize their installation.



Concrete loading platform on Market Street, San Francisco, the first city to install these aids to railway operation

Safety Platforms Aid Traffic Movement

Survey shows use of raised loading areas alongside street railway tracks in 30 cities has greatly facilitated operation of cars and all vehicular traffic. Details of construction and lighting are given

By John A. Miller, Jr.
Associate Editor *Electric Railway Journal*

RAISED loading platforms, or "safety isles," alongside street railway tracks have come into use in many of the larger cities of the United States during the past few years. San Francisco, where such platforms were installed 22 years ago, was the pioneer in this development. Today they are used in Chicago, Philadelphia, Detroit, Los Angeles, Cleveland, St. Louis, Baltimore, Pittsburgh, Newark, Washington, Cincinnati, Indianapolis and numerous other cities. In order to secure definite information concerning the construction and use of these platforms a survey has been made by ELECTRIC RAILWAY JOURNAL and the results are given in this article. This shows that officials of railways in 30 of these cities are agreed in thinking that loading platforms are a substantial aid to the expeditious movement of all traffic, as well as a great protection to the car riders and pedestrians.

Dimensions of the loading platforms vary widely in different cities, but the general design usually is much the same. An accompanying table gives the principal dimensions of loading platforms used by 27 railways in 30 cities. Materials used in their construction and the agencies by which they were built also are listed. Except in a few instances the material used is concrete. The Capital Traction Company builds platforms of wood on Pennsylvania Avenue, Washington, D. C., on account of the necessity of removing them during parades. Wood platforms are used also at Cambridge and Worcester, Mass.; Akron, Ohio, and Louisville, Ky. Platforms of precast reinforced concrete slabs are used by the United Railways & Electric Company of Baltimore. These are built in 8-ft. sections at the company's material yard, as shown on page 644.

In length the platforms vary from 18 ft. to 215 ft. Those shorter than 50 ft. are the exception. Lengths between 50 ft. and 100 ft. are the most common. Among the users of platforms more than 100 ft. in length are the Northern Ohio Power & Light Company at Akron, where the platforms are 150 ft.; the Capital Traction Company, 192 ft.; the Worcester Consolidated Street Railway, 200 ft.; the Los Angeles Railway, 215 ft., and the Department of Street Railways, Detroit, 220 ft. Triple or quadruple berthing of large cars is possible at these long platforms, while elsewhere the usual practice is double or single berthing. At the other extreme of size is Seattle, where the platforms are only 18 ft. long. This length has been adopted because all passengers board and alight at the rear end.

Widths of loading platforms vary between 3 ft. and 8 ft. Most common are widths of 4 ft., 4 ft. 6 in. and 5 ft.

Principal Dimensions of Loading Platfo

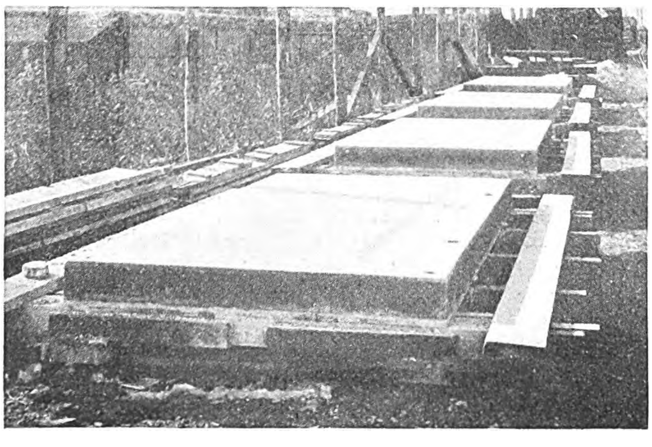
Railway	Length	Width	Height from Pavement	Distance from Rail
Atlantic City & Shore Railroad	50 ft.	4 ft. 0 in.	5½ in.	2 ft. 3 in.
Boston Elevated Railway	100 ft.	5 ft. 0 in.	6 in.	2 ft. 3 in.
Capital Traction Company	48 ft. to 192 ft.	4 ft. 4½ in. and 6 ft. 0 in.	8½ in.	2 ft. 0 in.
Chicago Surface Lines	50, 70 or 100 ft.	4 ft. 0 in.	6 in.	2 ft. 9 in.
Cincinnati Street Railway	50 ft.	4 ft. 6 in.	6 in.	1 ft. 6 in
Cleveland Railway	Various	3 ft. 6 in. and 4 ft. 0 in.	6 to 8 in.	2 ft. 1 in. to 2 ft.
Department of Street Railways, Detroit	Various	8 ft. 0 in.	6 in.	1 ft. 10 in.
Georgia Power Company	100 ft.	4 ft. 6 in.	8 in.	1 ft. 10 in.
Indianapolis Street Railway	108 ft.	6 ft. 0 in.	4 in.	2 ft. 1 in.
Los Angeles Railway	50 to 215 ft.	3 ft. 2 in. to 4 ft. 5 in.	5, 8, 9 in.	2 ft. 6 in. to 2 ft.
Louisville Railway	80 ft.	4 ft. 6 in.	8 in.	2 ft. 0 in.
Market Street Railway & Municipal Railway, San Francisco	60 ft. 2 in.	6 ft. 0 in.	6 in.	2 ft. 8 in.
Morris County Traction Company	35 ft.	4 ft. 0 in.	5 in.	....
Northern Ohio Power & Light Company	50 to 150 ft.	4 ft. 0 in.	5½ in.	2 ft. 4 in.
Pittsburg Railways	50 to 100 ft.	4 ft. 6 in.	5 to 6 in.	1 ft. 4 in.
Philadelphia Rapid Transit Company	80 ft.	Various	4 to 5 in.	1 ft. 10 in.
Public Service Railway of New Jersey	50 to 100 ft.	5, 6, 7 and 8 ft.	4 to 8 in.	1 ft. 10½ in. to 2 ft.
San Diego Electric Railway	30 ft.	6 ft. 6 in.	8 in.	2 ft. 4 in.
Schenectady Railway	80 ft.	6 ft. 0 in.	6 in.	2 ft. 0 in.
Seattle Municipal Railway	18 ft.	6 ft. 0 in.	6 in.	....
Terre Haute, Indianapolis & Eastern Traction Company	80 ft.	5 ft. 0 in.	4 in.	1 ft. 6 in.
United Electric Railways, Providence	4,000 ft.	3 ft. 6 in.	6 in.	2 ft. 6 in.
United Railways & Electric Company, Baltimore	Various	4 ft. 0 in.	6 in.	2 ft. 0 in.
United Railways, St. Louis	100 ft.	4 ft. 7 in.	Slope 2 to 5¼ in.	1 ft. 7 in.
Wilkes-Barre Railway	60 ft.	4 ft. 0 in.	6 in.	2 ft. 1¾ in
Worcester Consolidated Street Railway	80 to 200 ft.	3 ft. 0 in. to 6 ft. 0 in.	8 in.	1 ft. 10 in.

Considerable variation occurs also in the distance from the gage line of the rail to the inside edge of the platform. This distance is governed by the clearance line of the car. To avoid accidents platforms usually are so placed that an unfolded step will not overhang more than a few inches, but this practice is not always followed. At Pittsburgh the distance is 1 ft. 4 in. At Cincinnati and Terre Haute it is 1 ft. 6 in. From these figures the distances range upward to 2 ft. 9 in. at Chicago and 2 ft. 10 in. at Los Angeles. Probably the average distance is about 2 ft.

Height from pavement to top of platform varies from a minimum of 4 in. to a maximum of 9 in. Six inches is the most usual height. A sloping platform is used at St. Louis. On the side nearest the rail its height is only 2 in., while on the outside the height is 5¼ in. A sectional view is shown in accompanying drawing.

MUNICIPALITIES PAY COST OF BUILDING PLATFORMS

Cost of construction of loading platforms is borne by the municipalities in most instances, although there are also a number of cities where the railway has paid the entire expense. At Philadelphia, San Diego and at Worcester the cost is shared by the municipality and the railway. The city of Los Angeles has paid for the building of combination comfort stations and safety isles, but the ordinary loading platforms are paid for by the railway.



Precast slabs for loading platforms built by United Railways & Electric Company, Baltimore

Lighting of safety isles and protection against being overrun by vehicular traffic are prominent features of design. Nearly all of the platforms are provided with some sort of warning lights. In many instances they are placed only at the end toward approaching vehicles, but usually they are to be found at both ends. Often ornamental iron posts are employed as shown in accompanying sketches. Oil lanterns are utilized by the Capital Traction Company, the Louisville Railway, the Terre Haute, Indianapolis & Eastern Traction Company, the Georgia Power Company and the Worcester Consolidated Street Railway to light safety isles in the cities where these companies operate. An advantage claimed for this method is its independence of the general street lighting system. In case of failure of the street lights, the warning lanterns on the loading platforms continue to burn. At Seattle the lamps on the safety isle are tapped from the trolley wire. Gas lights are used on safety isles in some of the New Jersey suburban towns in which Public Service Railway operates. In Atlantic City the concrete loading platforms have mushroom electric lights at both ends. Flashing beacons are used in Chicago, Pittsburgh, Providence, Baltimore and St. Louis. Red reflectors at the end toward approaching traffic serve as auxiliary warning devices on numerous platforms.

PROTECTION AN IMPORTANT ELEMENT

To protect people waiting on the platforms from vehicular traffic, bumpers of various kinds are generally installed. Ordinarily a bumper is placed at only the approach end of the platform, although in some instances bumpers have been built at both ends, as was done in the Wilkes-Barre safety isles shown in an accompanying illustration. Concrete or reinforced concrete is frequently used for this purpose. Pieces of old rail often are buried

ed by 27 Railways in 30 Cities

Material	Built by	Lighting	Type of Protection	Period of Use
Concrete	City	Mushroom Electric	None	3 years
Wood	Railway	None	Pipe stanchions	1½ years
Wood	Railway	Oil lanterns	None	10 years
Concrete	City	Flashing Beacon	Bumpers	3 months
Concrete	City	Electric beacon	Short pieces of rail	6 months
Concrete	City	Electric lights	Concrete bumper	....
Concrete	City	Electric lights	Concrete bumper	7 years
Concrete	Railway	Oil lanterns	Concrete bumper	1 year
Concrete	City	Electric lights	None	10 years
Concrete	City and railway	Electric lights and reflectors	None	5 years
Wood	Railway	Oil lanterns	Wood and concrete pedestal	1 year
Concrete	City	Electric lights	Concrete bumper	20 years
Concrete	City	Electric lights	Reinforced concrete post	3 years
Wood and concrete	Railway	Electric lights	Pipe stanchions	2 years
Wood	Railway	Flashing beacons and reflectors	None	5 years
Wood	City	Connected with traffic lights	Stanchions	1½ years
Concrete	City	Electric and gas lights	Concrete bumper	6 years
Concrete	City and railway	Electric lights	Concrete bumper	1½ years
Concrete	City	None	Pipe stanchions	5 months
Concrete	Railway	Tap from trolley	Concrete bumper	6 years
Concrete	Railway	Oil lanterns	Concrete bumper	2 years
Concrete	City	Flashing beacons	None	4 months
Precast concrete	Railway	Flashing beacons	None	4 years
Concrete	City and railway	Flashing beacons	Concrete bumper	6 months
Concrete	Railway	Electric lights	Concrete bumper	6 months
Wood	City	Oil lanterns	None	3 months

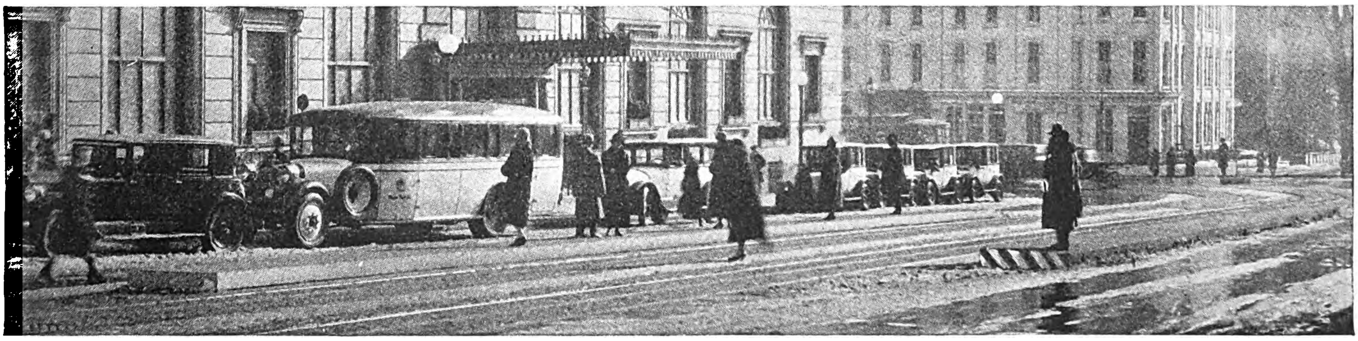
in the concrete to give added strength. At Cincinnati short pieces of vertical rail imbedded in the pavement create a substantial barrier. At Newark the concrete bumper has been extended to form a bench on which waiting passengers may sit. Sometimes these bumpers are painted with black and white stripes to attract attention. The Georgia Power Company in Atlanta utilizes the bumper to carry a list of the car lines passing that point. Pipe stanchions and chains are used by the Boston Elevated Railway and the Northern Ohio Power & Light Company. On the other hand, in a number of cities reliance is placed entirely on the height of the platform above the pavement to prevent encroachment by vehicular traffic.

CONTINUOUS SAFETY ISLE AT PROVIDENCE

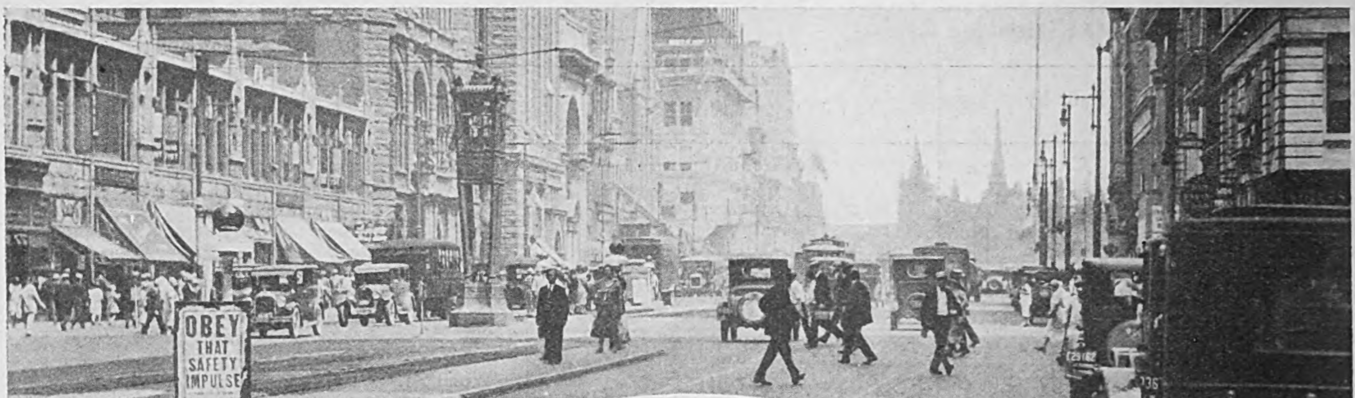
Perhaps the most unusual type of loading platform disclosed by this survey is one located on North Main Street, Providence, R. I. This extends alongside the tracks of the United Electric Railways from Grand View Street to Eighth Street, a distance of 4,000 ft. It is built of concrete, 3 ft. 6 in. wide and 6 in. high. At intersecting streets there are gaps in the platform to permit vehicular traffic to cross from one side of North Main Street to the other. At the end of these platforms and in the middle of the intersecting streets flashing beacons have been placed. The effect of this construction is practically equivalent to providing a reserved strip in the center of the street for railway operation.

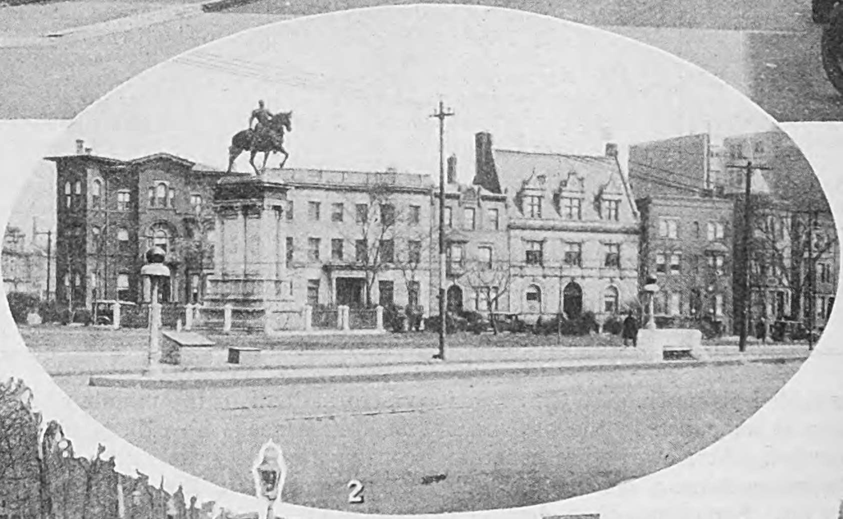
Opinion of railway officials is quite definite that the minimum width of roadway between curbs is **44 ft.** where loading platforms are to be installed alongside double track. Assuming that a double-track street railway utilizes 18 ft. of roadway, there remains 26 ft. for other vehicles, of which 13 ft. will be on each side of the track. If the width of the platform is 4 ft., there remains a 9-ft. lane for vehicular traffic. A few officials consider it desirable to have an even wider roadway between curbs where platforms are used, specifying street widths up to 60 ft. Again, assuming 18 ft. for the railway and 4 ft. for each platform, there remains a vehicular roadway of 17 ft. on each side, which may be considered sufficient for two lanes of traffic.

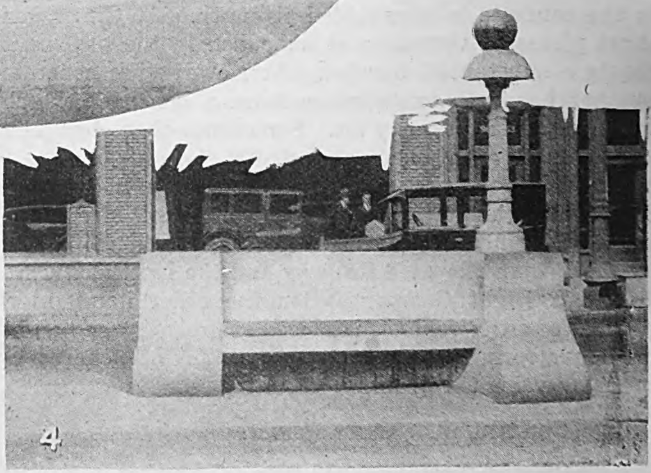
In harmony with this conclusion is the opinion that the roadway should be at least 36 ft. from curb to curb in a street where loading platforms are used alongside a single track. Assuming that 10 ft. is required for the cars and 4 ft. for the platform, there remains a 9-ft. vehicular roadway on each side of the street.

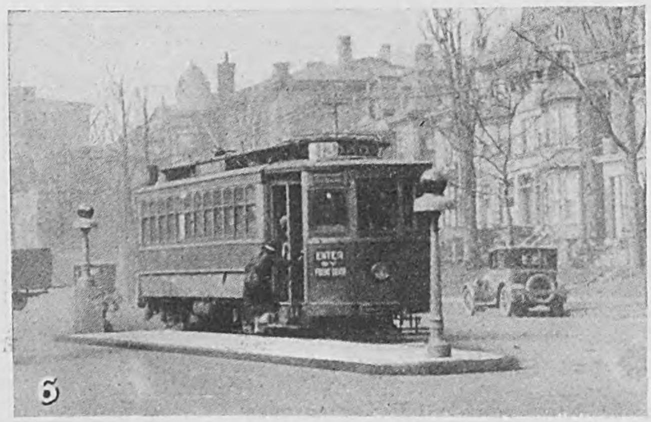


Wood platforms used by Capital Traction Company on Pennsylvania Avenue and Fifteenth Street, Washington, D. C., are built in sections to facilitate removal during parades







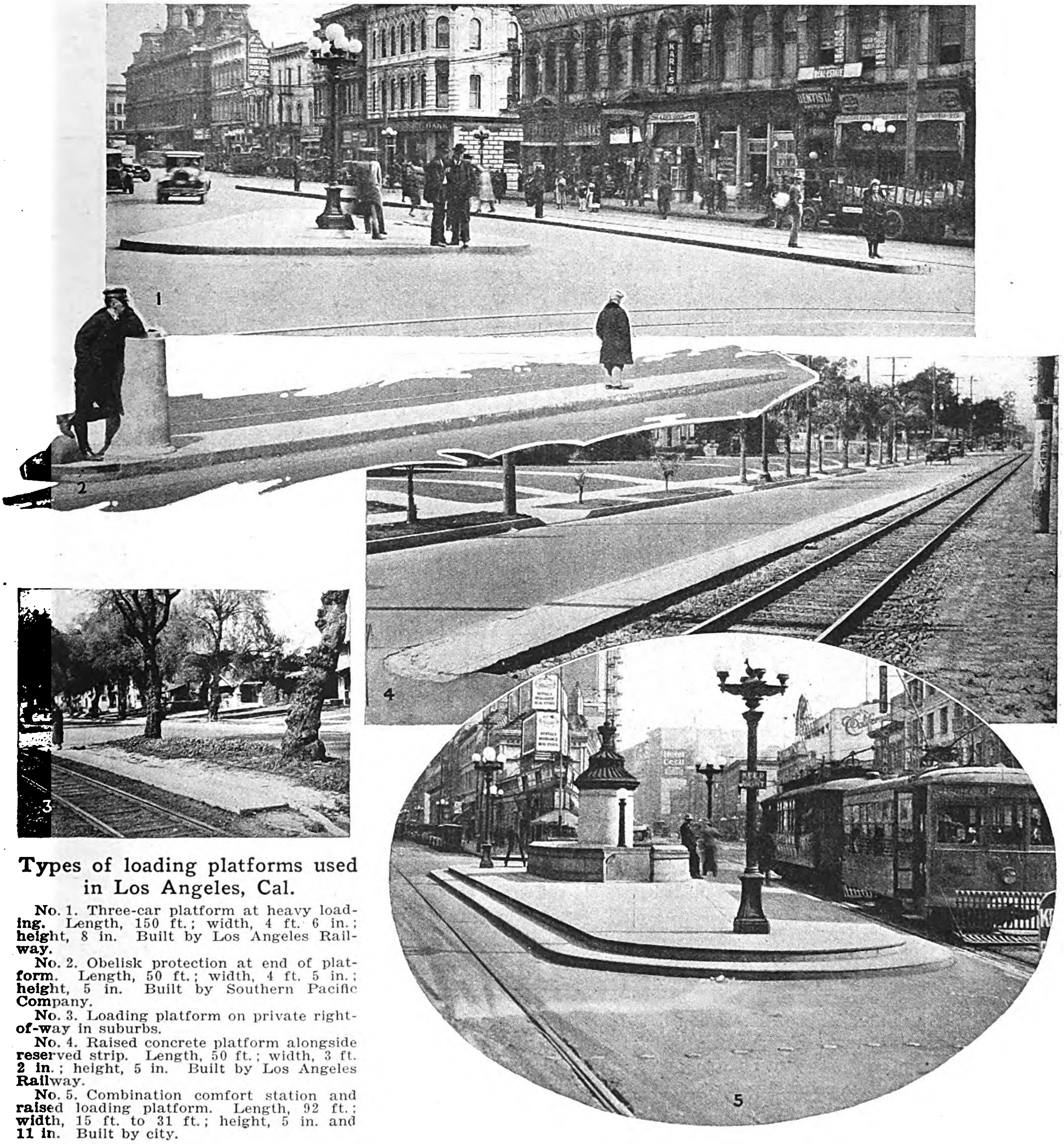


Loading platforms are used extensively along the lines of Public Service Railway, Newark, N. J.

No. 1. Platforms at Broad and Market Streets, the busiest intersection in the city, are 96 ft. in length.
No. 2. Latest type platform, which accommodates two cars.
No. 3. In the suburbs some platforms are lighted by gas.
No. 4. Combination concrete bumper and seat at end toward oncoming vehicles.
No. 5. Lamp post at unprotected end of platform.
No. 6. Passenger boarding front entrance car at platform.

In congested areas loading platforms speed up railway service because they "enable people to be at the boarding point as the cars approach instead of standing on the sidewalk and then threading their way through a maze of traffic to reach the car after it has stopped." Such is the opinion of A. E. Potter, president United Electric Railways, Providence, R. I. A similar opinion is expressed by J. B. Stewart, Jr., general manager Cincinnati Street Railway, who says: "Passengers are on the platform ready to board the car instead of being on the curb, which delays the car while passengers are trying to get across among the automobiles."

According to A. T. Warner, general manager in charge of traffic Public Service Railway, Newark, N. J.,



Types of loading platforms used in Los Angeles, Cal.

No. 1. Three-car platform at heavy loading. Length, 150 ft.; width, 4 ft. 6 in.; height, 8 in. Built by Los Angeles Railway.

No. 2. Obelisk protection at end of platform. Length, 50 ft.; width, 4 ft. 5 in.; height, 5 in. Built by Southern Pacific Company.

No. 3. Loading platform on private right-of-way in suburbs.

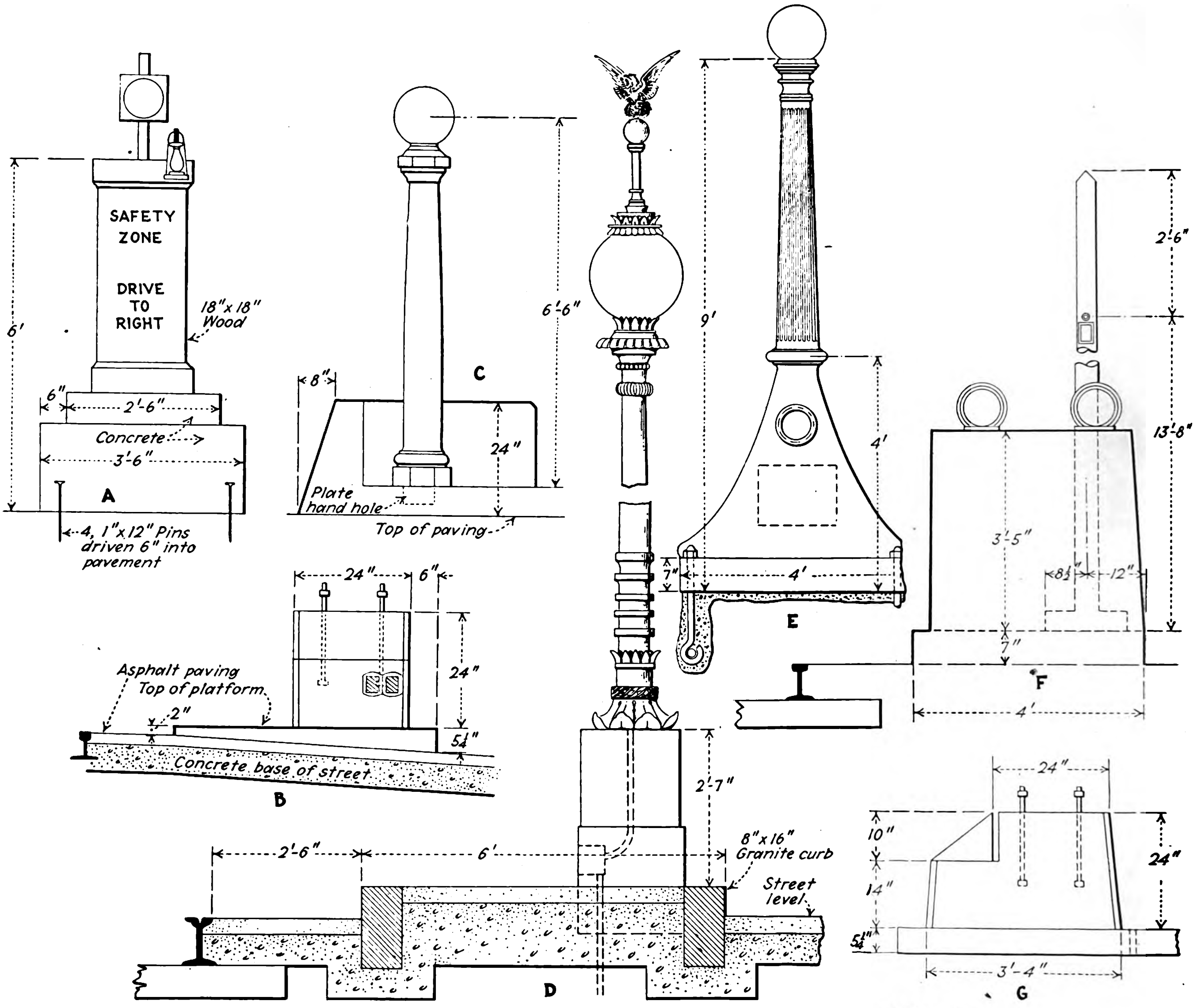
No. 4. Raised concrete platform alongside reserved strip. Length, 50 ft.; width, 3 ft. 2 in.; height, 5 in. Built by Los Angeles Railway.

No. 5. Combination comfort station and raised loading platform. Length, 92 ft.; width, 15 ft. to 31 ft.; height, 5 in. and 11 in. Built by city.

"There is no question but what a safety isle properly located has a number of advantages both from the public point of view and that of the operating company. First, it definitely establishes a point at which the cars will stop. Second, and of equal importance, it provides a haven of refuge adjacent to the track where prospective passengers can rest in safety while waiting for their cars. It also speeds up loading by making it possible for the passenger to be at one point ready to board the car when it arrives there." Stop-watch checks made at Newark show that it takes considerably less time for a passenger to board a car from a platform than the pavement.

Among others who expressed the opinion that the use of loading platforms speeds up railway service are Samuel Riddle, vice-president Louisville Railway; M. McCants, general manager Market Street Railway, San Francisco; T. H. David, principal assistant engineer Terre Haute, Indianapolis & Eastern Traction Company; R. E. Weber, engineer way and structures Schenectady Railway; D. A. Scanlan, general superintendent of railways Northern Ohio Power & Light Company; O. G. Schultz, general manager Morris County Traction Company; S. E. Mason, general manager San Diego Electric Railway; D. W. Henderson, general superintendent of railways, Seattle; A. J. Purinton, general superintendent Atlantic City & Shore Railroad; H. R. Whitney, vice-president Worcester Consolidated Street Railway, and C. A. Smith, superintendent of roadway Georgia Power Company.

On the other hand, doubt was expressed by E. J. McIlraith, staff engineer Chicago Surface Lines, and



Electric lamps, oil lanterns and reflectors used to mark safety platforms

A. At Louisville, Ky., loading platforms are protected by red lanterns as well as standard traffic lights.

B. St. Louis loading platform is lower on side near rails.

C. Arrangement of lamp post and bumper on Seattle, Wash., safety isle.

D. Graceful lamp post used to mark safety isle in San Francisco.

E. Combined lamp post and bumper to be installed at Atlanta, Ga.

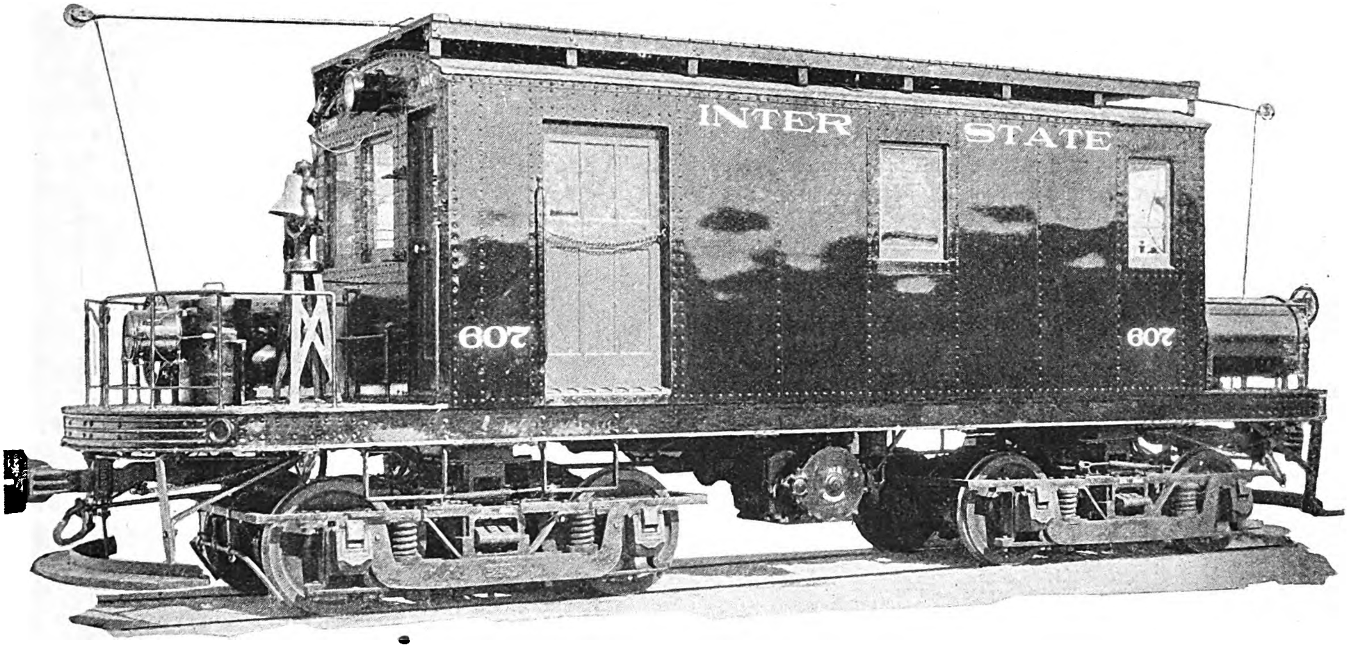
F. End view of loading platform at East Cleveland, Ohio.

G. Side view of bumper on loading platform in St. Louis, Mo.

R. B. Hill, superintendent of operation Los Angeles Railway, concerning increased speed resulting from the use of loading platforms. In Los Angeles, however the difficulty is caused primarily by the use of traffic signal lights, the operation of which nullifies the possible advantages of the loading platform so far as speed is concerned.

Opinion as revealed by the survey was practically unanimous that raised loading platforms are superior to safety zones marked by paint, buttons or stanchions. W. R. Dunham, Jr., executive engineer Department of Street Railways, Detroit, believes that platforms are superior, but not sufficiently so to warrant the additional expense. If stanchions are rugged enough to prevent the encroachment of vehicular traffic the safety zone is as satisfactory as the raised platform, according to C. W. Wilson, research manager Pittsburgh Railways. Safety zones marked by cast-iron buttons set in the pavement are used to a considerable extent. More than 150 such zones have been established in San Francisco, according to M. M. O'Shaughnessy, city engineer. A post type safety zone built in that city at Market and Stockton Streets in 1925 has proved very satisfactory. Detroit, Denver, Terre Haute and San Diego are other cities using buttons or posts to mark safety zones. The majority opinion in favor of raised platforms, however, is well expressed by R. H. Dalgleish, chief engineer the Capital Traction Company, who says: "We consider the platform much more desirable than the painted safety zone as it affords better protection to waiting passengers."

Practice concerning the operation of vehicles other than cars inside the loading platforms is not uniform throughout the country. In some cities it is permitted. At San Francisco it is forbidden on Market Street and permitted elsewhere. In Los Angeles automobiles intending to make a left turn are required to stop inside the loading platforms and wait for the signal light permitting the turn. This practice has resulted in considerable interference to railway operation. In Schenectady buses are permitted to use the space between the platforms, but other vehicles are not allowed to do so. In a majority of cities from which information was secured in this survey general vehicular traffic is not allowed to pass inside the platforms. Opinion of operating officials strongly supports this regulation.



A 40-ton locomotive built by the Interstate Public Service Company from discarded material of two old bridges

Locomotives Constructed Out of Bridge Material

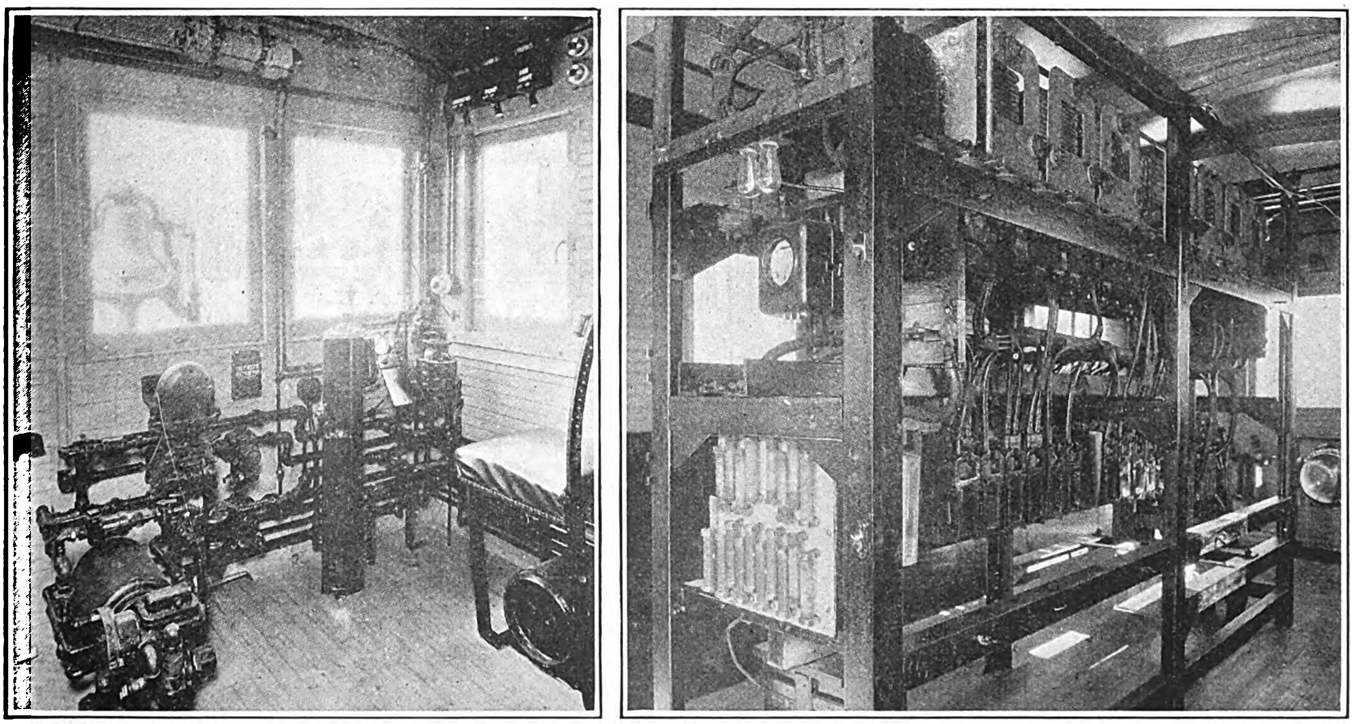
By C. M. Bange
Master Mechanic Interstate Public Service Company, Scottsburg, Ind.

When two large bridges were replaced in southern Indiana considerable steel in good condition was available. Some of this was used by the Interstate Public Service Company in the construction of a high-speed 40-ton locomotive in the Scottsburg shop. The locomotive will be used to haul freight between Indianapolis, Ind., and Louisville, Ky.

Working drawings were first prepared and the work laid out under the direction of the master mechanic. Credit for the splendid construction, however, belongs to the men in the shop.

The engine is 35 ft. long over bumpers, the central cab being 21 ft. in length. Truck centers are 18 ft. and the total height from rail to trolley base is 13 ft. 2 in. The two trucks are equipped with 34-in. rolled steel wheels.

Steel is used throughout in the construction of the cab except the floor and inside sheathing. The roof is steel, except for a wood platform to protect the crew when working on a live trolley. The window and door casings are made of No. 12-gage steel bent to the proper



At left—Motorman's position on one of the Interstate locomotives. At right—Plates removed from the control cabinet show mounting of the control equipment in the Interstate 40-ton locomotive angle and then welded at the joints and riveted to form a watertight job.

All equipment is carried above the floor line except the air compressor and brake cylinder. Reservoir tanks and sand supply are carried on the open platforms. Heavy iron railings guard the platform ends.

Propulsion equipment consists of four Westinghouse 303-A motors, 115 hp. each, geared 16:61. Control equipment is a modification of the General Electric type M, built from material on hand. Two type C6-K ten-point controllers are used, mounted in each motorman's position. All wiring is in metal conduit. Type MS-14 switches are used for control circuits, lighting and air compressors.

Westinghouse type 14-EL straight and automatic air brakes are used with a provision for using straight air on the locomotive alone.

The locomotive has a free running speed of 45 m.p.h. when running light and will haul eight to twelve loaded cars at 22 to 28 m.p.h. The cab arrangement allows full visibility in all directions. With the compressor mounted below the floor the noise is eliminated and comfortable quarters for the train crew are thus provided.

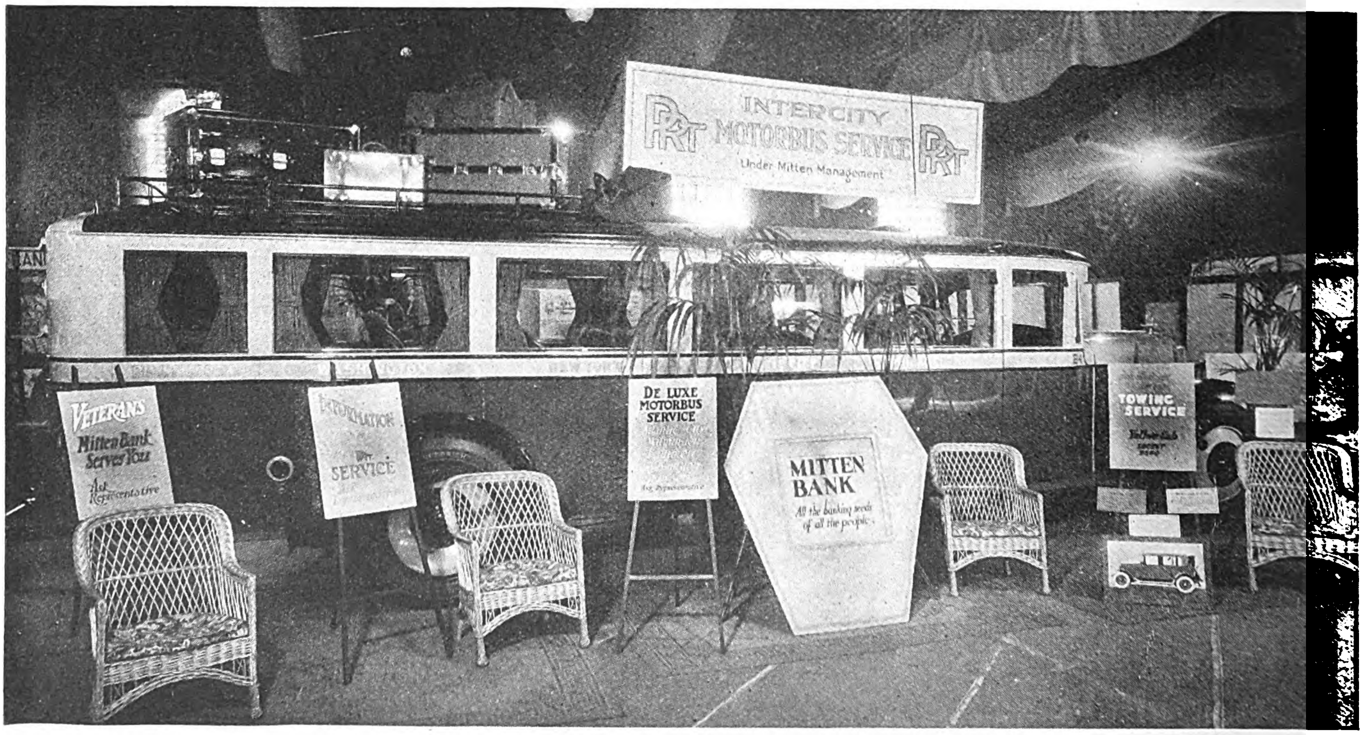
P. R. T. Bus Is Featured at the Philadelphia Home-Building Show

EACH year a home-building show is held in Phildelphia. Each year the Philadelphia Rapid Transit Company stages a comprehensive exhibit at this affair to stress the fact that adequate public transportation is indispensable to the development of a community of homes. During the show this year, which was held in the First Regiment Armory, Feb. 7-12, it was again decided to use one of the company's de luxe gas-electric parlor car type buses for the central element in the exhibit. While in the opinion of the company these units are not the type usually employed to serve newly developed residential sections, they nevertheless have a very beautiful appearance and were well adapted for a public exhibit, the comfort of the seats making them a popular resting spot for the visiting public. To encourage visitors to enter the bus and gain an impression of its roomy and comfortable interior arrangement the scheme was hit on of placing a transparent screen on the front windshield and then throwing moving pictures upon it from a machine placed directly in front of the bus.

Several reels of pictures, filmed by the P. R. T., were used, one of these gripping dramas being entitled "What the Motorman Sees," while another took the spectators on a trip through "Industrial and Historic Philadelphia." The former proved to be the most popular, particularly with the younger visitors, who swayed from side to side and squealed excitedly as the car in which "our hero" was stationed bore down upon careless automobilists and pedestrians. The films were run at frequent intervals throughout the day and evening and the S. R. O. sign had to be hung out at each performance.

Representatives of the street car, bus and Yellow Cab divisions of the company were on hand in uniform to hand out literature to the public and to answer any questions which might be asked. There was also an ex-service man on hand in his army uniform to answer questions concerning the service which the Mitten Men and Management Bank and Trust Company has been rendering to veterans in extending loans on their adjusted service certificates. An added touch of reality was given to the exhibit by the array of baggage placed in the rack on the roof.

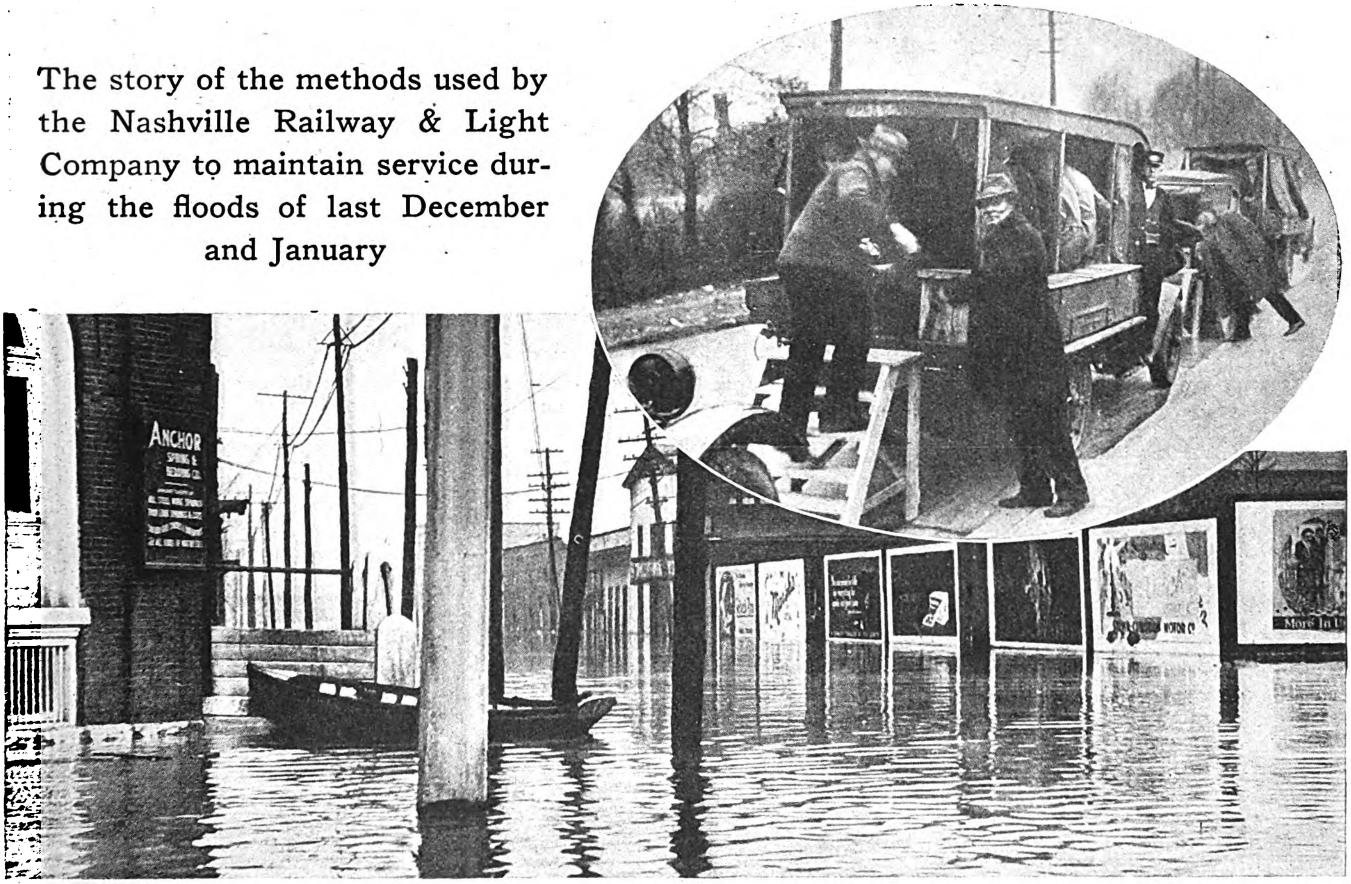
Progressive traffic control signals showing red and green lights simultaneously at alternate intersections were put in operation April 5 on Chestnut Street, Philadelphia. They replace the hand semaphores which have been in use recently. Some time ago the same electric signals were in use with a system of synchronized control. Comparisons will be made of traffic flow under the different systems.


PRT
INTER CITY MOTORBUS SERVICE
Under Mitten Management
PRT
VETERANS Mitten Bank Serves You Ask Representative
INFORMATION PRT SERVICE
DE LUXE MOTORBUS SERVICE
MITTEN BANK All the banking needs of all the people
TOWING SERVICE

One of the highlights of the recent Philadelphia Home-Building Show was the gas-electric bus exhibited by P. R. T.

Meeting an Emergency in Nashville

The story of the methods used by the Nashville Railway & Light Company to maintain service during the floods of last December and January


Scene on the North First Street line. The water at this point was about 3½ ft. deep. In oval—Emergency transportation was given by the railway's line trucks and other vehicles, in addition to which other vehicles were rented

CRISES in the operation of transportation lines are relatively rare. Some of the unusual events can be planned for in advance, but when the forces of Nature combine to attack a whole city, as they did Nashville, Tenn., during the flood of the last holiday season, it takes heroic methods to combat them. While it is to be hoped that other transportation companies will not have the opportunity of adopting methods similar to those used by the Nashville Railway & Light Company in keeping up service, the record of the preparations made and the results obtained are of great interest.

A series of terrific rains, reaching a climax during Christmas week, was experienced in the Cumberland Valley and the vicinity of Nashville. The first part of Christmas week there was a 5.5-in. rainfall, but although river traffic was tied up, trains were running late and warehouses were being vacated, it was still hardly more than a high-water story to the newspapers. On Christmas Eve the gage showed a depth of 43 ft., but even then it was expected that the river would recede within 24 hours.

Radio station WLAC went on the air Christmas Day with the first news that people were fleeing in all directions and indicating the seriousness of the situation. The rain lasted until Dec. 28, with a total precipitation of 11.38 in. The water continued to rise until Dec. 29, reaching a height of 56.2 ft. and shattering the previous record of 55.2 ft., registered in 1882. Until Sunday, Jan. 2, the Cumberland clung to its high stage, then fell to 55 ft. the next day, thereafter falling much more rapidly until it was back to something like normal.

The river at one point was more than 3 miles wide. Practically all towns to the east of Nashville became isolated and mail had to be carried to them by airplane. All main highway cities to the east were cut off. When it approached its highest point the flood began to cripple street railway and bus service, with the ultimate result that thirteen of the Nashville Railway & Light Company's lines were under water. It is a matter of record that lines of the company were kept open despite the greatest handicap they ever operated under. This was accomplished only by the greatest effort and sacrifice of the employees. The majority of the men worked day and night, sticking to their cars and seeing that they did not shut down no matter what came. As a typical example, one man who was so zealous in his work actually was on his feet 48 consecutive hours without a wink of sleep.

NEW BUSES PLAYED HEROIC PART

It just so happened that when the flood reached the perilous stage seven new Yellow motor coaches purchased by the company had arrived from Chicago. To start with, the delivery of these coaches was held up about eight hours by floodwaters when 50 miles out of

Nashville. These buses played a heroic part in the emergency, arriving just in time to go into service in order to transfer the very first water-marooned passengers around the flood area to waiting street cars.

In many instances the buses plowed through water right up to the motor. This service was performed under these strenuous conditions without any trouble and without any of the buses having either operating or mechanical difficulties of any kind, even though at times water ran right into the coaches themselves.

The flood situation became so bad that even these new motor coaches were unable to cope with the passenger transfer situation. The company pressed into service its overhead line trucks and every available motor vehicle. In addition outside equipment was rented to facilitate to the utmost the uninterrupted movement of passengers. At some points the car tracks were covered by 12 to 15 ft. of water. The following figures show the depth of water over points on the various routes:

Jo Johnson line	16.48 ft.
Lebanon line	12.31 ft.
First Avenue South line	10.2 ft.
North First Street line	10.82 ft.
Fourth Avenue South line	5.14 ft.
Main Street	5.33 ft.
North Second Street	4.79 ft.
Fourth Avenue North	4.48 ft.
Cedar Street	3.67 ft.
Fatherland Street	1.53 ft.
Woodland Street	.2 in.
Sixth Avenue South	.67 in.
Third Avenue South	.62 in.

Indicative of this condition the illustrations show the great depth of the water. In one will be noticed the car stop sign on the overhead guy line, which is just above the water line, indicating a depth of approximately 15 ft.

The company advertised in the local newspapers to keep its patrons informed from day to day as to the situation and to advise what steps had been taken to furnish them with transportation. One of these advertisements is reproduced herewith.

East Nashville is a distinct part of the town and there are three passenger bridges which connect it with the remainder of the city. Early in the flood, two of these three bridges were closed to traffic on account of the high water and the danger that they might collapse, the water having risen over the roadways on them. This left only one bridge open between the main part of the city and East Nashville, with the water continually rising. At this time the water height had broken a hundred-year record. The remaining bridge was the Woodland bridge, a steel structure,

NOTICE TO STREET CAR PATRONS

SOUTH NASHVILLE

Outbound passengers on the Fairfield and Radnor lines will ride cars bearing those names, but which will be routed out Sixth avenue, south, to Sixth and Ash. At this point transfers will be given, acceptable at Ash and Third avenue, for the remainder of the Radnor or Fairfield trip.

Inbound Radnor and Fairfield passengers will transfer at Third and Ash to cars waiting at Sixth and Ash, for the remainder of the trip to town.

EAST NASHVILLE

Outbound passengers on the Shelby line will ride either Porter Road or Inglewood car to Third and Woodland, at which point transfers will be given, acceptable at Third and Fatherland on Shelby cars, which will complete the outbound trip.

Inbound Shelby passengers will be given transfers at Third and Fatherland, acceptable at Third and Woodland, for the remainder of the inbound trip.

NORTH NASHVILLE

All passengers on inbound St. Cecilia and Buena Vista street cars will transfer at Fourth Avenue and Jefferson street to Jefferson street cars. By street car and motor bus, passengers will be transferred from this point to Twenty-second avenue and Cedar, where inbound West Nashville cars will take them, by way of Church street, to the uptown business district and the Transfer Station. Patrons of the Jefferson street line will be transferred at Sixteenth avenue over to Jo Johnson street cars and on to Twenty-second avenue and Cedar, where West Nashville cars will take them to the uptown business district and the Transfer Station.

Patrons of the Jo Johnson line wishing to reach the business district will ride the Jo Johnson car to Twenty-second and Cedar, transferring there to West Nashville cars for the trip to the business district and the Transfer Station.

Patrons of the Cedar street line wishing to reach the business district will ride the Cedar street car to Twenty-second and Cedar, where they will transfer to West Nashville cars, going to the business district and the Transfer Station.

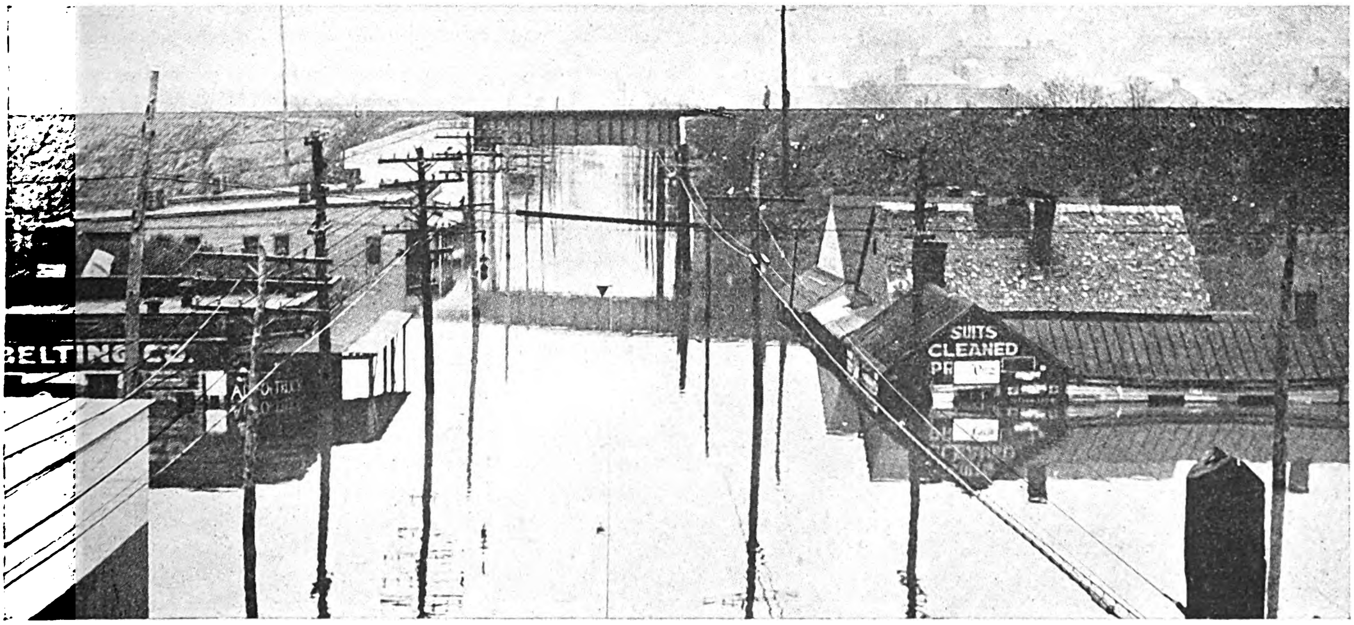
Patrons returning home on all the above lines will ride outbound West Nashville street cars to Twenty-second and Cedar, where they will be transferred to their respective street car lines.

THESE CHANGES IN SERVICE ARE DUE TO FLOOD CONDITIONS

The system of transferring on all other lines in the affected area remains unchanged.

Nashville Railway & Light Company

Advertisements like this one in the Nashville *Tennesseean* kept the public informed of the steps taken by the company to give emergency service



On the North Nashville car line the water was between 5 and 6 ft. deep

What Public Officials Thought of the Railway's Flood Service

CITY OF NASHVILLE
NASHVILLE, TENN., Jan. 21, 1927.

Mr. J. P. W. BROWN, Vice-president
Nashville Railway & Light Company,
Nashville, Tenn.

MY DEAR MR. BROWN: I want to commend publicly your company for the outstanding service it rendered a distressed city during the worst flood in Nashville's history.

I am sure that the public at large sincerely appreciates the service rendered by your company in such an extreme emergency.

With best wishes for you and your company, I am,

Sincerely yours,
HILARY E. HOWSE,
Mayor.

CHAMBER OF COMMERCE
NASHVILLE, TENN., Jan. 21, 1927.

Mr. J. P. W. BROWN, Vice-president
Nashville Railway & Light Company,
Nashville, Tenn.

MY DEAR MR. BROWN: As president of the Nashville Chamber of Commerce, I want to take this opportunity to recognize and to commend the Nashville Railway & Light Company for its splendid service during the recent flood.

I have heard on every hand the most laudatory comment concerning the tireless efforts and splendid accomplishments of your railway, power and lighting departments in the face of a tremendous handicap. Your company not only met the emergency by transferring passengers in buses around the flood area, and by organizing your other departments for flood relief, but it also made a generous contribution to the fund for alleviating distress.

In all of this work, I am sure that you have strengthened your friendship with the people of Nashville, and in this expression I am sure that I reflect the appreciation of all Nashville.

Sincerely yours,
CHAS. M. MCCABE,
President Chamber of Commerce.

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across which ran every street car line carrying passengers to East and Northeast Nashville. At this point centered the efforts of the railway. When the water started to climb on the east approach of the bridge it was realized that it would be only a matter of a few hours until East Nashville would be completely shut off from the rest of the city.

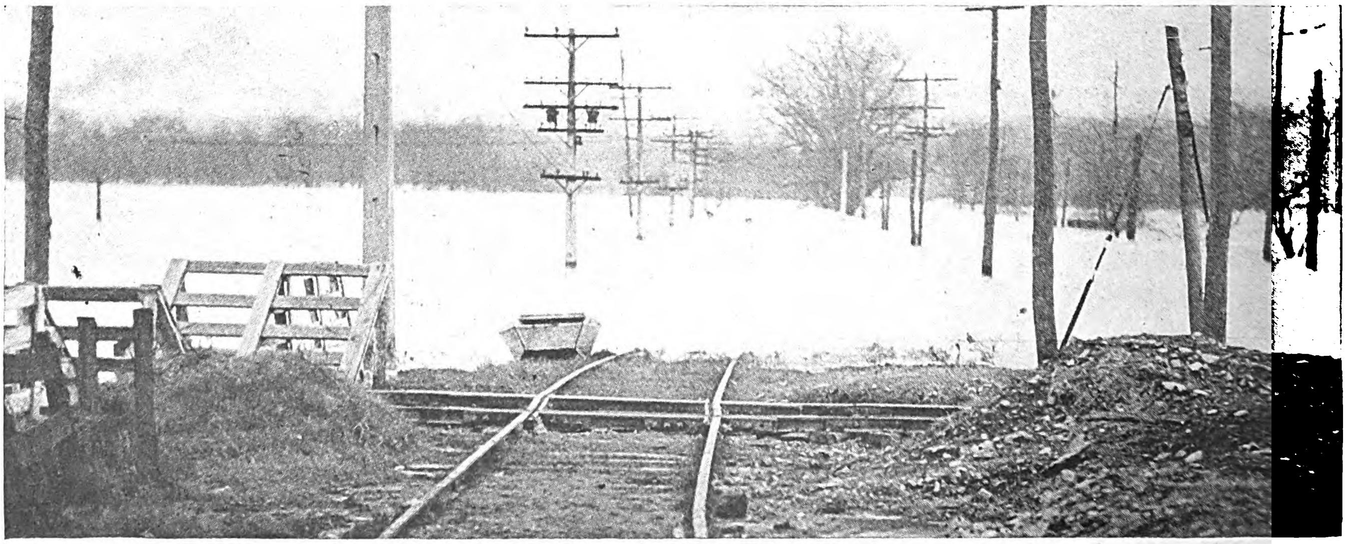
TRESTLE BUILT READY FOR USE

A hurried conference was held called by J. P. W. Brown, vice-president, with the department heads and it was decided to keep the East Nashville lines open at any cost. The shop forces immediately went to work to build a railroad trestle, the material being cut and placed in the carhouse. The trestle was built and the rails actually placed on it in the shop and held there, so that it was all ready to rush to the scene the moment it became necessary to operate the cars through water. The plan was to erect this trestle over the existing tracks and run the trolley cars over it. However, as it was completed the flood started to recede and its use became unnecessary.

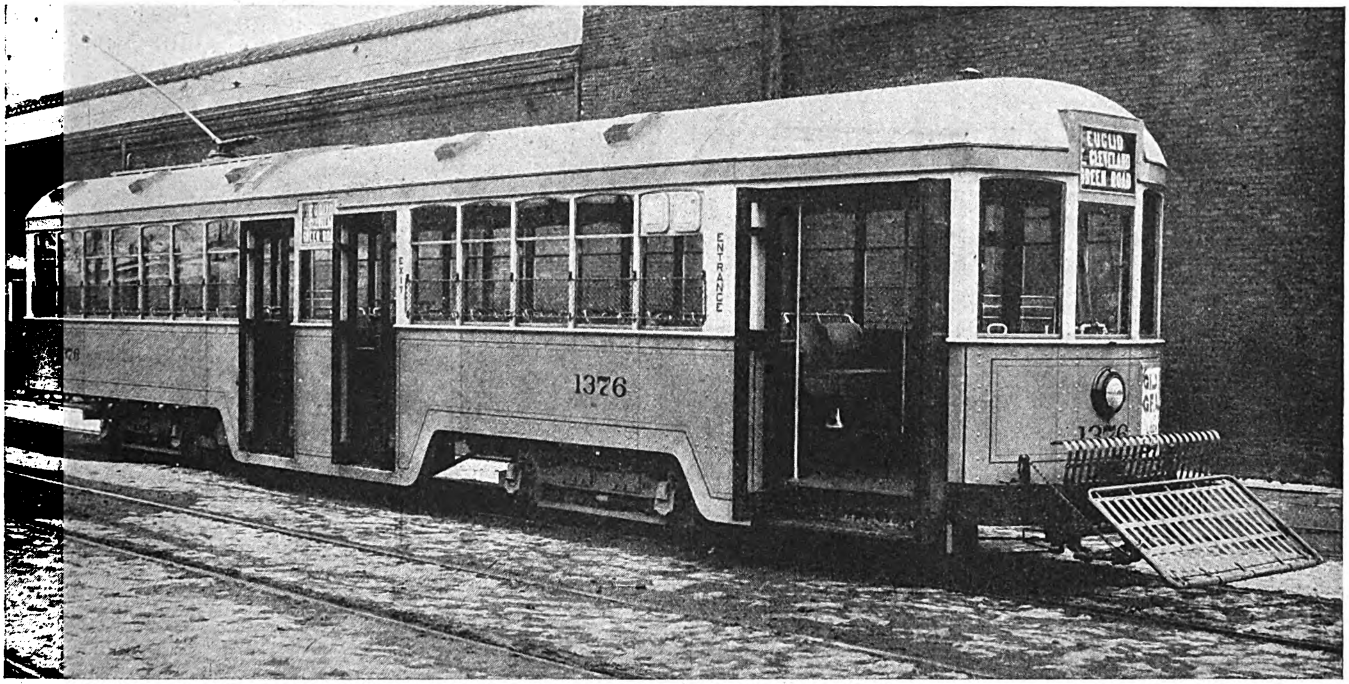
The property damage to the railway company's lines was not very great, but the company suffered a severe loss in revenue and was put to great expense in running the transfer service on the thirteen lines on which railway service had to be discontinued. The flood receded rapidly after passing the crest. Traffic was resumed by Friday, Jan. 7, on all lines.

Many letters were received by the company commending it on its meritorious service during these flood conditions. Outstanding among these were a letter from Mayor Hilary E. Howse and another from Charles M. McCabe, president of the Nashville Chamber of Commerce. Both of these letters are reproduced. They expressed the thanks of the residents of the city for the untiring efforts and the splendid accomplishments of the railway during the flood, although the company was operating in the face of tremendous handicaps.

In addition to the loss of revenue and the enormous expense the company was put to, it made a very generous contribution to the flood relief fund, for which subscriptions were solicited in the city, all of which received very favorable publicity.



The deepest water was on the Greenwood extension. A stop sign on the span wire may be seen in the distance just above the surface, indicating a depth of about 15 ft.



By the use of aluminum alloys for car framing and trucks this 51-ft. Cleveland car was made to weigh 30,300 lb., as compared with 43,200 lb. for the company's standard car of similar dimensions

Cleveland Aluminum Car
Proving Successful

Experimental car built by Cleveland Railway to determine possibilities of using aluminum alloys in car construction develops no weakness after more than four months operation

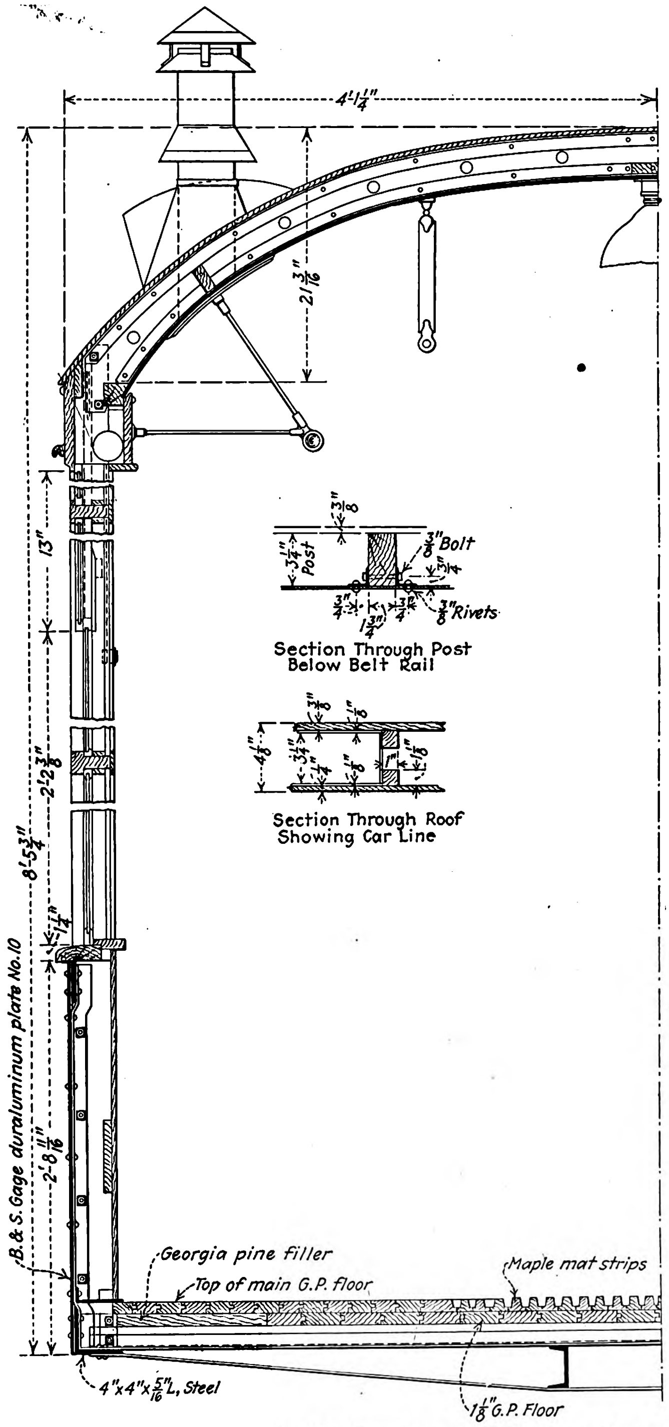
DURING the annual convention of the American Electric Railway Association at Cleveland last fall keen interest was shown by many delegates in the double-truck "aluminum" car for city service built by the Cleveland Railway. Since then many inquiries have been received by the company's officials from railway men in this country and abroad as to how this sample car has stood up in service. Due to the short time in which the car was built and the extent to which aluminum alloys were used for parts subjected to strains and shocks, even those who conceived the idea of building such a car expected that some weaknesses in the structure might develop after a period of operation under the severe service and loading conditions encountered in Cleveland. But more than four months of operation has failed to develop a single serious evidence of structural weakness.

The material used is duralumin, an alloy of aluminum with various combinations of magnesium, manganese, copper and silicon, to give the desired physical characteristics after heat treatment. This material, which is used extensively in the construction of aircraft, is obtained in form available for forgings, structural shapes, tubing and castings. It is claimed for duralumin that after it has been tempered the strength approaches that of mild steel.

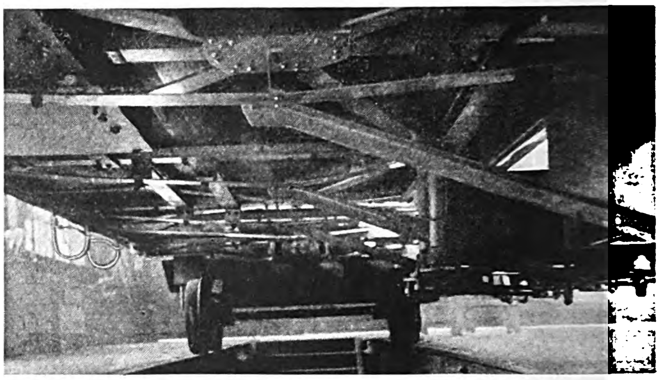
USED STANDARD CAR DRAWINGS

When J. H. Alexander, president of the Cleveland Railway, decided to go ahead with the construction of an experimental aluminum car for exhibit at the convention, time did not permit the structure to be specially designed for the new material. Consequently, the standard Cleveland drawings for a steel car of what is known as the 1300 type were followed, the duralumin being substituted for steel with practically no change in section sizes. The only parts in which the size was increased in aluminum alloys over steel were the body side sheets, the truck side frames and the body bolsters. The car was built in the Harvard shops of the railway company under the direction of Terence Scullen, master mechanic.

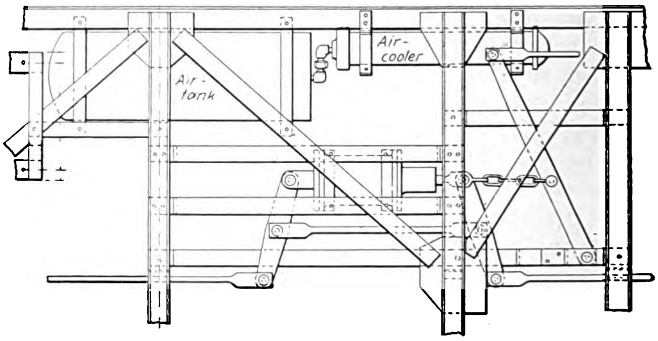
Except for the windows, doors, side sill angles, wheels, axles, springs, gears, journal boxes, air tanks, resistor grids, trolley base, motor magnet frames and the main body of the air compressor, the car structure and equip-


4'-1 1/4"
2'-1 3/16"
13"
2'-2 3/8"
8'-5 3/4"
1 1/4"
2'-8 11/16"
B.&S. Gage duraluminum plate No.10
3/8"
3 1/4" Post
3/8" Bolt
3/4"
1 3/4"
3/8" Rivets
Section Through Post Below Belt Rail
4 5/8"
3 1/4"
Section Through Roof Showing Car Line
Georgia pine filler
Top of main G.P. floor
Maple mat strips
4"x4"x5/16"L, Steel
1 1/8" G.P. Floor

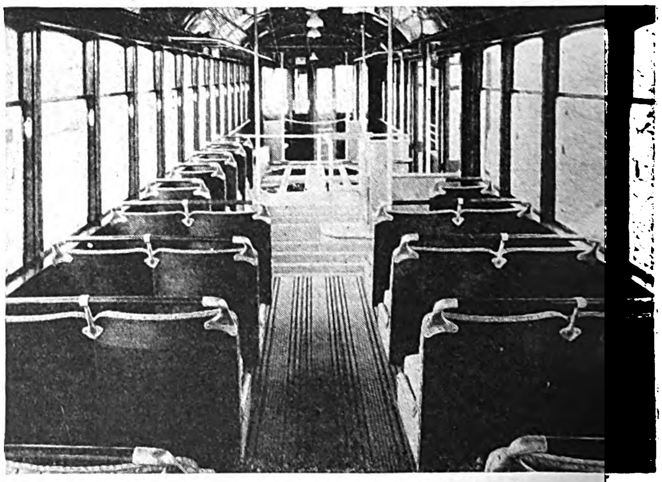
Vertical section through side framing of "aluminum" car. Side posts are wood, fastened to the duralumin side sheet by 1¼-in. duralumin angles riveted to the sheet and bolted through the post



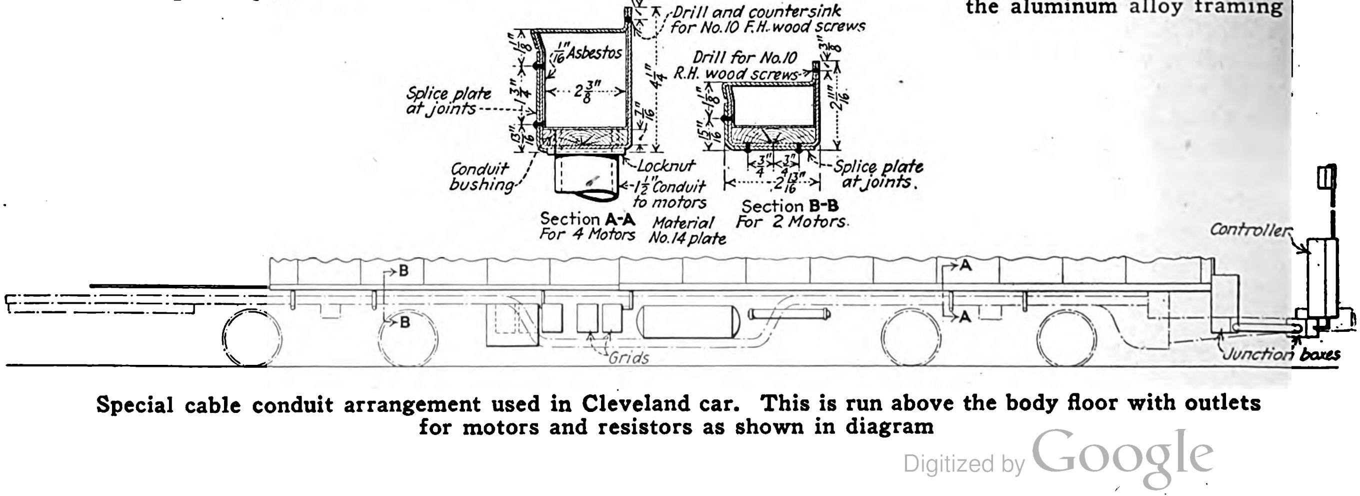
View looking up under car, showing aluminum alloy framing members, apparatus hangers and door mechanism


Air-cooler
Air-tank

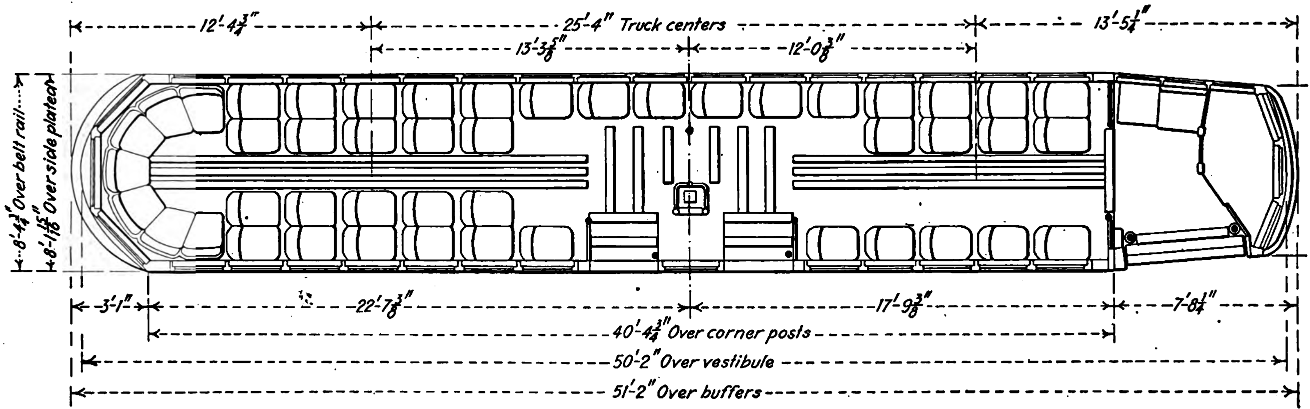
Foundation brake rigging layout of Cleveland car. Brake cylinder, levers and pull rods are aluminum alloy



Interior view of experimental "aluminum" car as exhibited during Cleveland convention, showing twin seat arrangement. For exhibit purposes a portion of the floor at the front end was cut away to show the aluminum alloy framing

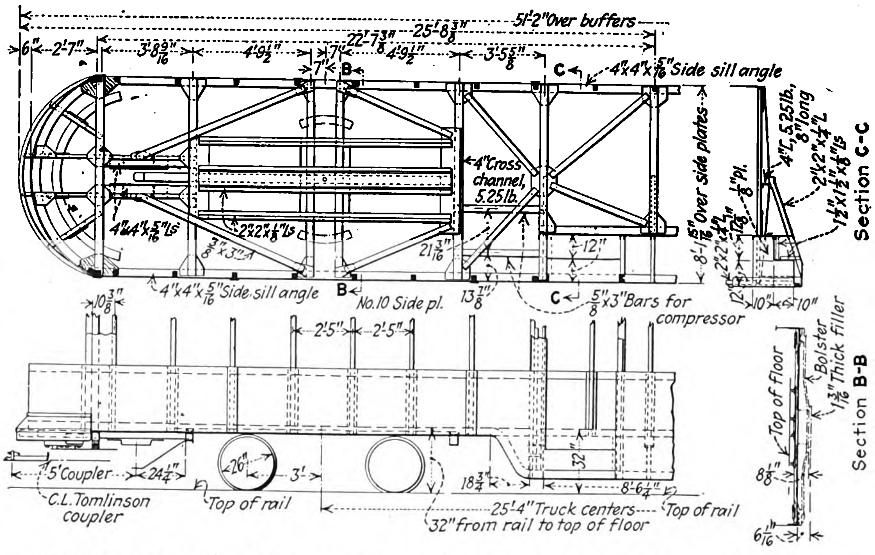

Drill and countersink for No.10 F.H. wood screws
1/16" Asbestos
2 3/8"
Splice plate at joints
Drill for No.10 R.H. wood screws
Conduit bushing
Locknut
1 1/2" Conduit to motors
Section A-A For 4 Motors
Material No.14 plate
Section B-B For 2 Motors
Splice plate at joints.
2 13/16"
Controller
B
A
Grids
Junction boxes

Special cable conduit arrangement used in Cleveland car. This is run above the body floor with outlets for motors and resistors as shown in diagram

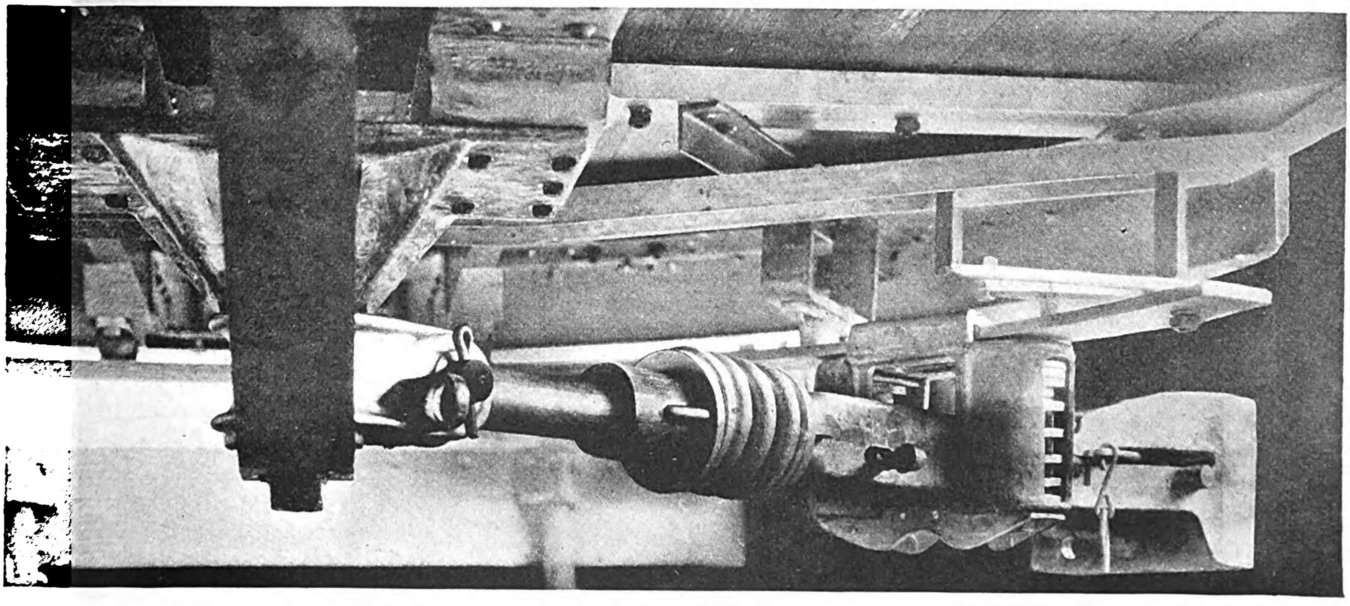

12'-4¾"
25'-4" Truck centers
13'-5¼"
13'-3⅝"
12'-0⅜"
8'-4½" Over belt rail
8'-1 5/16" Over side plates
7'-1"
3'-1"
22'-7⅜"
17'-9⅜"
7'-8¼"
40'-4¾" Over corner posts
50'-2" Over vestibule
51'-2" Over buffers

Comfortable individual seats in the Cleveland "aluminum" car are upholstered in rattan. The car is of the Peter Witt type, front entrance and center exit

ment are built almost entirely of duralumin. The material was furnished by the Aluminum Company of America in standard alloys of various compositions and physical characteristics depending upon the nature of the application. Rolled plates and extruded structural sections are made of what is known as 17-S alloy tempered to an ultimate strength of 55,000 to 60,000 lb. per square inch, yield point 30,000 to 40,000, elongation 18 per cent to 20 per cent, and modulus of elasticity 10,000,000. Standard commercial shapes in duralumin are made by the process of extrusion instead of rolling. In this process the alloy is heated until it has the consistency of jelly, and while in that condition is forced through dies into the desired shapes. The material used in forgings is called 15-S alloy and has practically the same physical characteristics as 17-S alloy except that the elongation is 16 per cent to 18 per cent instead of 18 per cent to 20 per cent. Duralumin tubing is made of 51-S alloy with an ultimate strength of 40,000 to 45,000 lb. per square inch, yield point 30,000 to 40,000 and elongation 10 per cent to 12 per cent. What is known as 195 alloy is used for castings. The normal characteristics of this material are: Ultimate strength, 28,000 to 30,000 lb. per square inch, yield point 15,000, elongation 6 per cent, and Brinell hardness 50. By varying the treatment of 195 alloy it is claimed that the ultimate strength can be increased to 36,000, the


51'-2" Over buffers
25'-8⅜"
22'-7⅜"
6"
2'-7"
3'-8 3/16"
4'-9½"
7"
4'-9½"
3'-5⅝"
B
C
4"x4"x 5/16" Side sill angle
4" Cross channel, 5.25 lb.
4"x4"x 5/16" Ls
2½"x2"x¼" Ls
21 3/16"
8'-1 5/16" Over side plates
12"
4" L, 5.25 lb., 8' long
2½"x2"x¼" L
Section C-C
4"x4"x 5/16" Side sill angle
No. 10 Side pl.
13⅞"
⅝"x3" Bars for compressor
10"
10⅜"
2'-5"
2'-5"
5' Coupler
24¼"
26"
3'
18¾"
32"
8'-6¼"
C.L. Tomlinson coupler
Top of rail
25'-4" Truck centers
32" From rail to top of floor
Top of rail
Top of floor
Bolster
1 3/16" Thick filler
Section B-B
8⅛"
6 1/16"

Framing diagram of Cleveland car. Duralumin is used throughout with exception of bumper and side sill angles



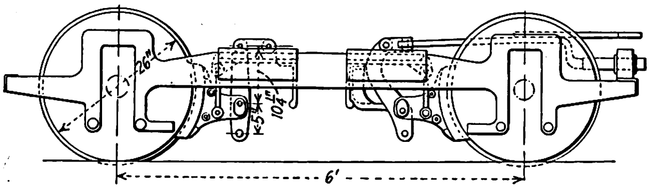
Coupler, anchorage casting and framing at rear end of Cleveland car are all made of aluminum alloys with the exception of springs and coupler hook

COMPARATIVE DATA ON THE STEEL AND ALUMINUM CARS

	Steel	Aluminum
General		
Class of car	Front-entrance, Center-exit	Front-entrance, Center-exit
Seating capacity	49	49
Standing capacity	91	91
Total load	140	140
Entrance arrangement	Front	Front
Exit arrangement	Center	Center
Car builder	Cleveland Railway	Clevelaıd Railway
Electrical Equipment		
Motors per car (four)	Westinghouse 340	Westinghouse 510-E
Horsepower per motor	40	35
Gear ratio	15:57	13:69
Control	K-35-G	K-35-KK
Truck and Air Brake		
Air brake	SME straight air	SME straight air
Compressor	Westinghouse DH-20	Westinghouse DH-20
Truck, type	Brill 68-E-1	Brill 68-E-1
Dimensions		
Length over bumpers	51 ft. 2 in.	51 ft. 2 in.
Length between truck centers	25 ft. 4 in.	25 ft. 4 in.
Truck wheelbase	6 ft. 0 in.	6 ft. 0 in.
Height from rail to top of roof	10 ft. $\frac{9}{16}$ in.	10 ft. $9\frac{7}{16}$ in.
Height from underside of sills to top of roof	8 ft. 5¾ in.	8 ft. 5¾ in.
Width of car body over side plates	8 ft. $1\frac{15}{16}$ in.	8 ft. $1\frac{15}{16}$ in.
Axle bearing diameter	4½ in.	4½ in.
Wheel diameter	26 in.	26 in.
Weights		
Car body without trucks or equipment	18,354 lb.	13,851 lb.
Trucks per pair without gears	12,096 lb.	8,220 lb.
Motor equipment	9,242 lb.	5,720 lb.
Control equipment	1,298 lb.	827 lb.
Air brake equipment and piping	1,764 lb.	1,301 lb.
Heater duct and heater	446 lb.	381 lb.
Total weight without load	43,200 lb.	30,300 lb.
Saving by use of aluminum alloys	12,900 lb.	

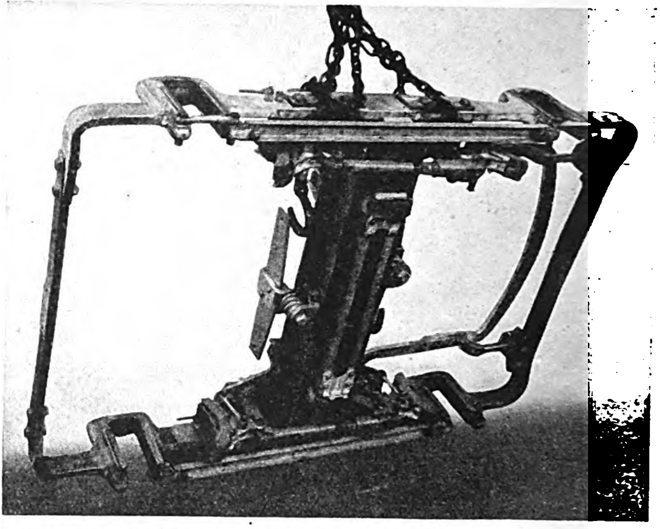
yield point to 27,000 and the Brinell hardness to 80. In this condition, however, there is no elongation and the material is very brittle.

On the body the side sill angles, rear bumper, the left-hand support of the front platform and a few minor parts of the structure are of steel. The duralumin side sheets are 0.125 in. thick in place of the 0.102-in. steel sheets used on the standard cars. The body bolsters are cast of 195 alloy, having a section approximately 20 per cent greater than the steel castings for which they were substituted. The trucks are Brill type 68-E-1 with forged side frames. Here again duralumin was substituted, but the side frame section was made somewhat thicker than normal to allow a greater factor of safety. The truck bolsters are likewise made of forged duralumin. Although the motor magnet frames are necessarily of steel, the motor axle caps, armature bearing housings at both ends and the gear cases are aluminum. All heater ducts, piping, brake levers and pull rods, apparatus hangers and the brake cylinder are aluminum. Although it was not possible to make the entire compressor frame of duralumin, this material was used for the end castings of the frame. Even such parts as the Tomlinson couplers and anchorage castings are aluminum alloy in their entirety with the exception of coupler hooks and springs.



Elevation drawing of Brill 68-E-1 truck. Side frames are made of forged duralumin

The rivets used throughout the body and truck are steel. It was not thought practical within the limited time available in building the car to attempt to develop a successful technique for hot driving and tempering aluminum alloy rivets in shops which were unfamiliar with their use.

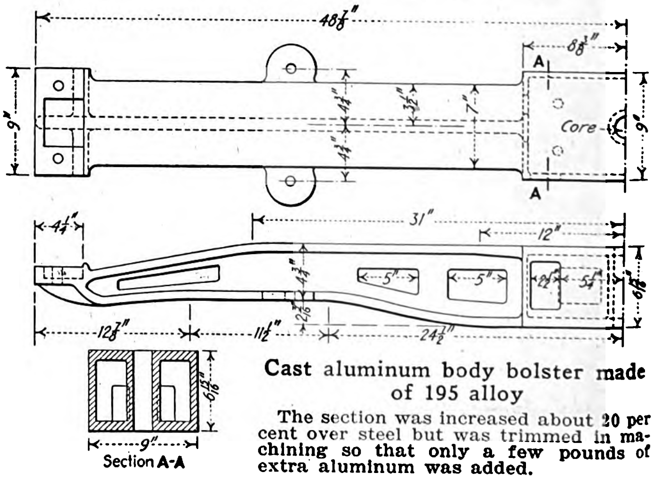


Frames of the Brill 68-E-1 trucks are forged duralumin. Likewise brake rigging, bolster, transoms and spring plank are made of the lightweight material

The car, which is shown in accompanying illustrations, is 51 ft. 2 in. long over the bumpers. Truck centers are 25 ft. 4 in. Height is 10 ft. $9\frac{7}{16}$ in. above rail and the car is 8 ft. $1\frac{15}{16}$ in. wide over side plates. It is of the front-entrance center-exit type with a seating capacity of 49 and an estimated standing capacity of 91, making a total carrying capacity of 140. Four Westinghouse 510-E, 35-hp. motors are used, with K-35-KK control. A Westinghouse DH-20 air compressor is provided. The car is glazed throughout with plate glass ⅛ in. thick.

Since the "aluminum" car was built entirely on an experimental basis, no comparative cost figures are available. In general, the aluminum alloys weigh about one-third as much as steel and the cost per pound in structural form is roughly six times that of steel. For a given structure, then, the cost in duralumin would be about double the material cost in steel. Against this should be credited the scrap value of the aluminum alloy.

Based upon its experiences with the sample car, the Cleveland management has found no serious obstacle to the general application of duralumin to car construction. The saving in weight that is made possible by the use of the lighter material is strikingly shown in the accompanying tabulation, which gives the principal dimensions, specifications, and a comparison of weights for a standard 1300 type car built of steel and the "aluminum" car made from the same drawings.



Cast aluminum body bolster made of 195 alloy

The section was increased about 20 per cent over steel but was trimmed in machining so that only a few pounds of extra aluminum was added.

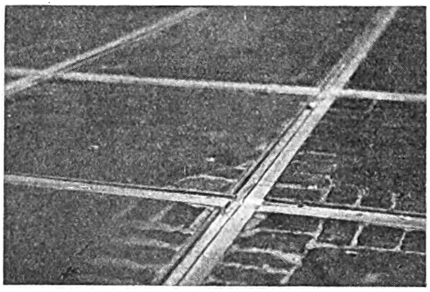
Maintenance Notes

Bearings Heated Over Slow Fire Before Babbitting

IF SUCCESSFUL babbitting of undersized journal and armature bearings is to be done, it is essential, in the opinion of J. W. Gordon, master mechanic Atlantic City & Shore Railroad, Atlantic City, N. J., thoroughly to remove all oil before beginning the process. This is accomplished in the shop of this railway by heating the brasses for one hour over a blacksmith's slow fire. Oil which has worked into the bearings is boiled out by this means. Only genuine babbitt metal is used. Babbitt that has been melted off armature brasses is used on journal brasses and axle bearings. For the armature bearings, however, only new metal is used. Due to the care in preparation of bearings, failures are said to have become practically a thing of the past on this road.

Maintenance Cheaper with Built-Up Special Trackwork

EXTENSIVE use is made of built-up special trackwork by the Market Street Railway of San Francisco for both angle and 90-deg. crossings. This type of special work is considered economical to maintain because it allows for extensive repairs by means of electric welding. The built-up type of crossing is assembled of 9-in., 106-lb. grooved girder rail. One set of rails is carried through the crossing, the head being cut out to allow for the flangeway of the crossing rail. The other rails are in short sections fastened to the through rails by angle plates ⅞ in. thick bolted directly to the short cross rails and through a 1⅛-in. filler block to the through rails. The entire assembly is mounted on a ⅝-in. steel plate 33 in. square. It is anchored by clips held in place with ⅞-in. key head bolts. After the crossing is made up all bolts are spot welded to prevent loosening. As this is a flange-bearing crossing, two steel wheel riders are riveted into the grooves of the rails at the crossing. With this type of construction it is possible to build up by electric welding those portions of the short lengths of rail which have a tendency to wear.



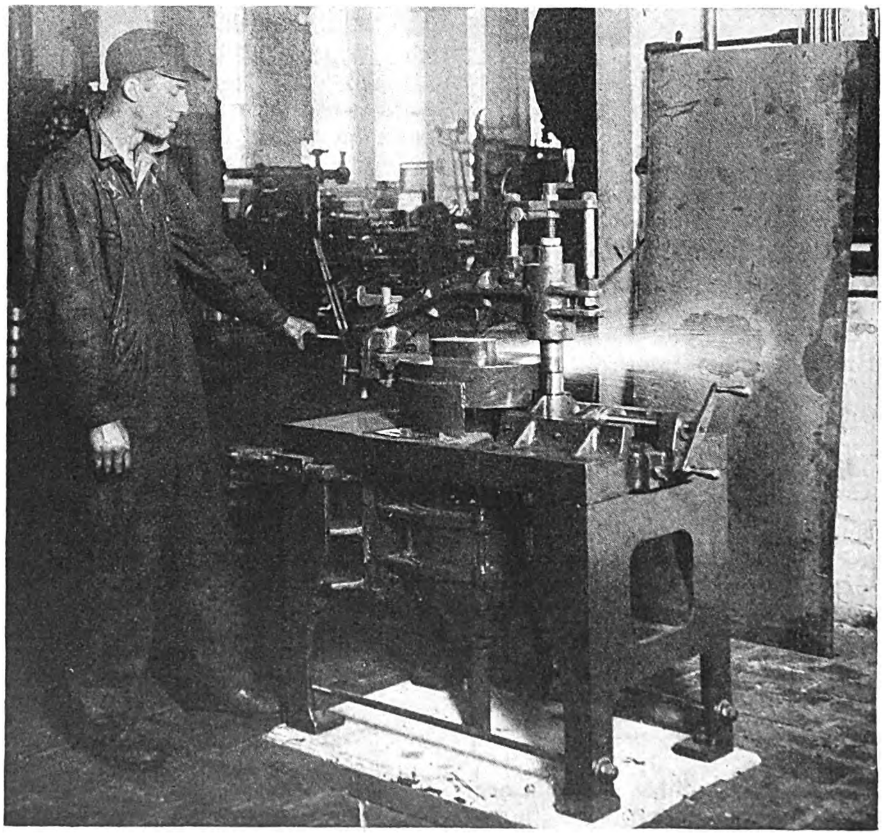
Built-up crossing which has been maintained in satisfactory operating condition by electric welding on the Market Street Railway

Repairs to this type of crossing are made very easily. For instance, in the case of a damaged short section between joints in the crossing, a plug is made up of a section of rail head mounted on a joint plate. The plate is bolted to the web of the rail and the head welded into the cut-out section of the original rail head. It is then built up by electric welding and made a continuous portion of the original rail. Complete rebuilding of an entire double-track crossing costs the company approximately $500.

A "hand to mouth" sustenance, applied to Maintenance, is downright extravagance.

Shoe Heads Ground Quickly

REALIZING that there was room for improvement in the method of grinding shoe heads, the Los Angeles Railway, Los Angeles, Cal., has constructed in its machine shop a very much improved machine for doing this work. One man with the new machine can grind from 150 to 180 shoe heads per day. This is 50 per cent more than by the previous



Grinding a shoe head by means of the new machine method, which used a rocker arm attached to a standard grinding machine. The grinding operation is part of the work done in reclaiming old shoe heads. Worn portions, particularly the tips of old shoe heads, are built up by welding and are then brought to the desired surface by grinding.

The new machine consists of a cast-iron bed 30 in. high, 22 in. wide and 38 in. long. A coarse alundum grinding wheel, 14 in. diameter by 3 in. thick, is mounted at the top of the bed. The wheel is driven by a vertical 5-hp., 1,500-r.p.m. motor which is installed underneath the bedplate.

For grinding the shoe head is held on a radius arm which rotates about a vertical post. This post is 2½ in. in diameter and stands 18 in. above the bed. A feature of the new machine is the simple and quick adjustment so that shoes can be placed in position and removed quickly. A pin placed through the shoe head fastens it to the radius arm. This pin has a tapered key on the top side for quick adjustment. Adjustments are also made by two screws of four-pitch on either side of the pin holding the shoe head. This adjustment is used for grinding the ends so the grinding can be done either vertically or horizontally.

The radius arm is 20¼ in. long, kept constant regardless of the size of the grinding wheel. Adjustment for bringing the shoe head to the grinding wheel is made through a pitch screw that forces the supporting base for the upright post either forward or backward, in guides along the bedplate. In the accompanying illustration this is shown at the right-hand end of the machine. In the grinding work both automatic and hand feed are provided.

To provide against possible accidents the radius arm has a stop pin which comes in contact with a stop plate fastened to the bed of the machine. This prevents the radius arm from swinging too far and endangering the workmen.

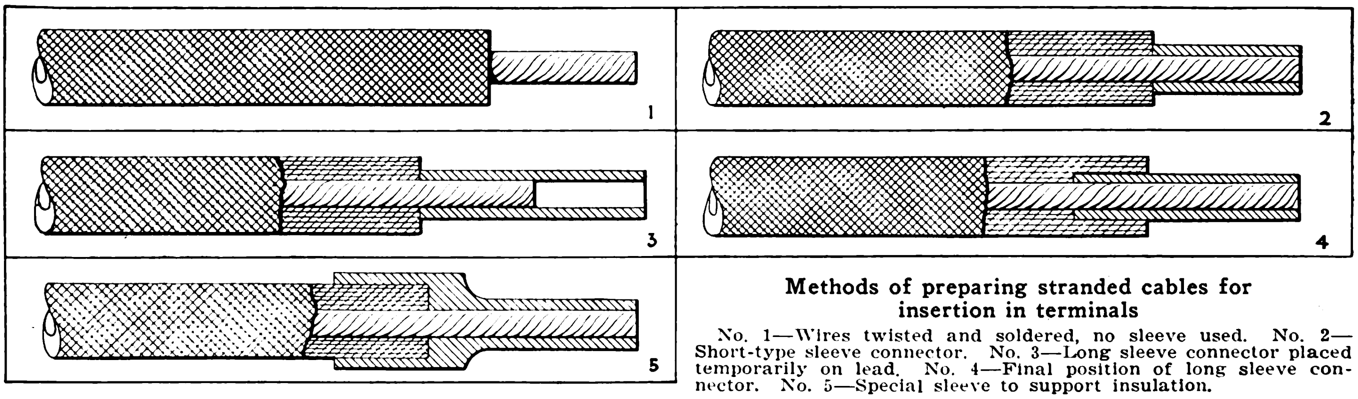
With the old method of grinding the shoe head was held in position by nuts. After one point had been ground down the nuts had to be loosened and the shoe head changed to another point. It was then tightened up again for grinding.

Sleeves for Cable Leads

By J. S. Dean

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

CONTINUALLY troubles occur in railway motors with the wiring around the frames and with the cable leads outside, due to breaking of the copper wires at the point where the insulation is cut away from the cable. It is almost impossible to remove this insulation without nicking or cutting several of the copper wires. In a comparatively short time these nicks cause the wire conductor to break at this point. Some of the schemes in common use at present and a few new ones suggested to remedy this condition are given in the accompanying illustration.



Methods of preparing stranded cables for insertion in terminals

No. 1—Wires twisted and soldered, no sleeve used. No. 2—Short-type sleeve connector. No. 3—Long sleeve connector placed temporarily on lead. No. 4—Final position of long sleeve connector. No. 5—Special sleeve to support insulation.

The most common method used to finish the ends of the cable leads is shown at the top. Here the strands of wire are soldered together to make a solid conductor. This provides a solid seat for the ends of the screws in the terminal and makes a better joint than if the strands of wire are left unsoldered.

The second method shows the end of the cable with a short sleeve slipped over the strands of copper and soldered in place. This is an improvement over the preceding, as it provides a better contact in the terminal and thus is less liable to heat up in service.

The next two illustrations show how a long copper sleeve can be forced underneath the insulation. The sleeve is first placed temporarily over the copper strands and then is pushed in place under the rubber insulation of the cable. This is done while the sleeve is being heated and soldered to the copper wires of the cable, which in turn softens the insulation. This type of sleeve reinforces the copper wires at the end of the insulation and transfers the strains on these wires back under the insulation on the cable, so minimizing the breakage of wires at this point.

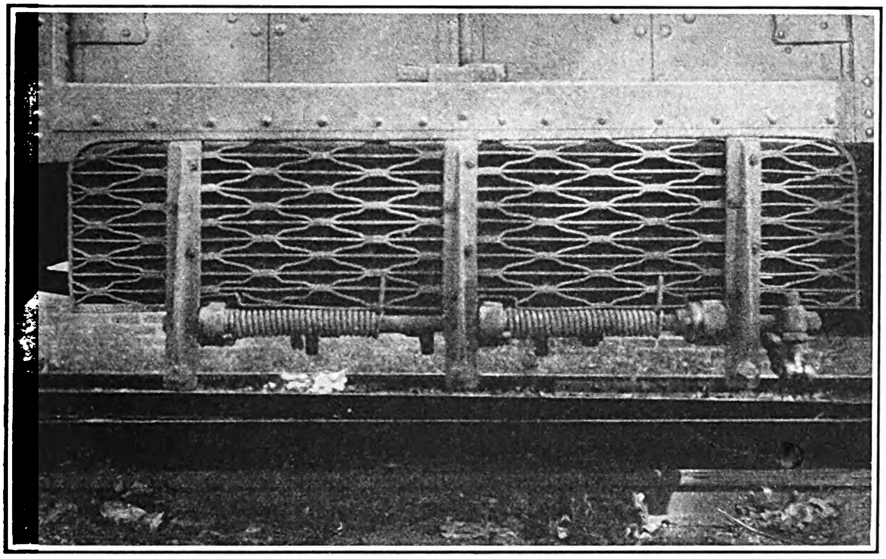
The bottom illustration shows a special type of combined terminal and sleeve which supports the insulation on the cable. This type of terminal strengthens the copper wires of the cable where they may have been damaged by cutting off the insulation. It also transfers the strain on the wires back some distance under the insulation of the cable, so as to increase the life of the connection.

Investigate your troubles, then
Invest-in-a-gate to stop them.

Hot Water Used for Truck Cleaning

WATER at 300 lb. pressure and at 140 deg. temperature is now used by the Market Street Railway, San Francisco, Cal., for cleaning dirty trucks. This is taken from a new high-pressure water system recently installed in the shops and makes the cleaning of dirty trucks a matter of only a few minutes.

Metal Car Steps Reduce Maintenance



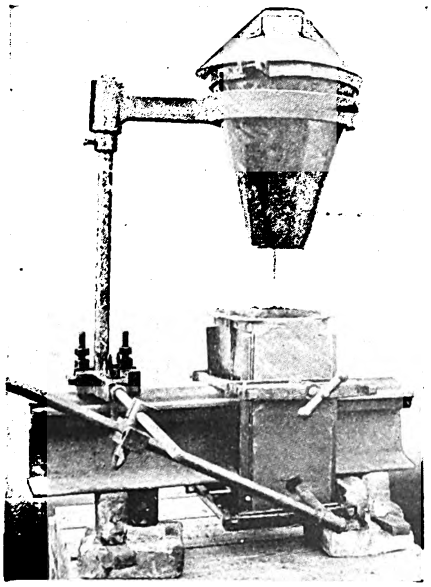
Standard metal step folded up

ONLY a few cars of the Wilkes-Barre & Hazleton Railway, Hazleton, Pa., are operating with wooden steps, as a metal step made by the Irving Iron Works has been adopted which is sanitary, self-cleaning, fireproof, non-slipping and presents a very neat appearance. Wooden step maintenance costs are usually very high due to breakage, splitting and decay. It is claimed that since the metal steps have been installed this item of maintenance costs has practically ceased.

New Equipment Available

Improved Thermit Nozzle Holder

COMBINATION of a crucible stand, base and nozzle holder has been made recently for thermit rail welding. This adaptation simply has used the pedestal type holder with the heavy base replaced with a simple clamping device which is clamped on the rigid crucible stand.



Crucible and preheater holder clamped to rail

This new method of holding the preheater nozzle is an improvement over the pedestal type in which the weight of the base held the nozzle in place against an occasional jar caused by a workman striking or stepping upon the hose leading from the preheater.

Shoe Brake for Crane and Hoist Motors

WITH the purpose of meeting the demand for a shoe brake for crane and hoist motors with long life for the lining and permitting quick removal of motor armature with the brake wheel in place and without the necessity of taking the brake apart, the Electric Controller & Manufacturing Company, Cleveland, Ohio, has brought out the type WB brake. This brake has no levers or rods to pass over the top of the brake wheel. The brake shoe arms are caused to operate in opposite directions by means of a simple lever movement having the connecting links within the base below the wheel. Steel castings machined to a high degree of accuracy and oversize bearing pins are used. The brake shoe linings are of asbestos interwoven with wire and molded to shape under heavy pressure. Linings are ½ in. thick on the smallest size brake and ⅝ in. thick on the largest size. This permits a large amount of wear before replacement is needed.

Convenient Wrench Kit

CHROME-VANADIUM right-angled wrenches are a new style recently introduced by the Bonney Forge Tool Works, Allentown, Pa. These are of the double-end type, but vary from the conventional wrench in that the jaws are at right angles to the handle. The new No. 4 kit is a sample, consisting of three of the most popular sizes. The price of the complete kit is less than would be paid for the wrenches alone if bought singly.

Three wrenches in convenient case

The manufacturer guarantees that these wrenches are stronger than the bolt or nut which they fit and will strip the thread or break the bolt without damage to the wrench.

Disinfectant for Cars

LEINOL pine is now being used by the Market Street Railway, San Francisco, Cal., to disinfect its cars daily. Leinol pine is manufactured by the John F. Leinen Sanitation Company, San Francisco, Cal., and has a pleasing pine odor. Its inoffensiveness makes it possible to apply it daily by means of a simple machine.

American Association News

American Executive

SEVERAL important committee reports were carefully studied nad fully discussed by the American Electric Railway executive committee at a meeting held April 1 at association headquarters in New York. Progress was reported in carrying out the plans started under the leadership of President Sawyer and Managing Director Storrs for improving the association's service to the industry and keeping abreast of changing conditions and modern transportation requirements. Those in attendance at the meeting included the following: W. H. Sawyer, president; R. P. Stevens, J. P. Barnes, J. H. Hanna, L. S. Storrs, F. R. Coates, L. E. Lippitt, C. B. Proctor, Daniel Durie, Harry Reid, C. E. Morgan, E. P. Waller, B. A. Hegeman, Jr., G. A. Richardson, T. A. Kenney, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, H. L. Brown, T. W. Casey, J. N. Shannahan, C. D. Emmons, W. R. Robertson, W. R. Power, A. E. Reynolds, R. B. Stearns, T. R. Langan, F. B. Bullock representing J. H. Alexander, H. V. Bozell, Paul E. Wilson, Edward Dana, Charles Gordon, J. W. Welsh, G. C. Hecker, J. W. Colton, Leslie Vickers, F. C. J. Dell and Labert St. Clair.

CHANGES IN CONSTITUTION PROPOSED

With the object of making the association representative of all constructive factors in the development of transportation, the committee on revision of the constitution recommended that bus companies not directly affiliated with electric railways be made eligible for membership under definitely defined conditions. This broadening of membership requirements was recommended under the following conditions:

"Company members shall consist of American companies operating any form of organized urban or interurban transportation system, or lessees or individual owners of such systems, or management or holding companies all of whose eligible subsidiary companies are company members of the association, or steam railroads having electrified sections or operating motorized equipment, and of companies, firms or individuals manufacturing or supplying materials or rendering service to such transportation companies.

"Before passing upon applications for membership of operating transportation companies, the executive committee shall cause to be published to the membership in the official publication of the association, or otherwise as the executive committee may direct, a list of such applicants under consideration together with the recommendation of the membership committee.

"Further, in the consideration of such applications as mentioned above the executive committee shall endeavor to secure in writing the advice of all operating member companies in the immediate vicinity of the applicant. Further, one of the essentials to membership shall be that, in the opinion of the executive committee, the applicant shall be fully serving or able in fact and holding itself in readiness fully to serve the transportation needs of the territory in which the applicant is operating, and/or shall be conducting its operations in line with the policies of co-ordinated transportation which the association indorses.

"Further, affirmative action of the executive committee at the time of first consideration of such application shall be only tentative; final affirmative action at a subsequent regular meeting shall be necessary before election of the applicant is effected.

"American, as here used, shall be understood to mean 'located inside the United States of America and Canada.'

"In the ordinary association procedure each company member shall be entitled to one vote, which shall be cast by its properly accredited delegate. Any accredited delegate may demand plural voting on any question, in which case each company member shall be entitled to one vote for each five hundred dollars ($500.00) or major fraction thereof, of annual dues paid to the association, with a minimum of one vote. Plural voting shall always be used in adopting standards of the engineering association. Representatives of company members shall be entitled to hold office in the association. Company members, whether operating, manufacturer or foreign, shall, in general, be entitled to all of the privileges and services of the association. The executive committee may define, from time to time, other privileges of such members and the amount of service which may be furnished and any additional charges necessary."

Other changes contemplated in the constitution were outlined by H. V. Bozell on the request of C. D. Emmons, chairman of the committee on constitution revision. The executive committee discussed the revisions as they were presented. Action was postponed until the next meeting so as to give each member an opportunity to go over the revised draft in detail.

Recommendations by the policy committee for co-ordinating the efforts of the association and other agencies working in the interest of industry development were presented in a report by Chairman R. P. Stevens, which was as follows:

"First—Your policy committee recommends that the magazine *Aera* be continued substantially in its present form, but with the advertising eliminated, cost of publication reduced, and with closer co-ordination with the technical press, to minimize duplication. Also, that the president be authorized to appoint a committee to work out such a plan, with no increase in expense to the association, and report back such plans to the executive committee.

"Second—That there should also be much closer co-ordination between our statistical department and the technical press as to securing, analyzing and publishing statistics, and that the president be authorized to appoint a subcommittee to work out a plan for such co-ordination, with no increase in expense to the association, and report back such plan to the executive committee.

"Third—Your committee recommends that no action be taken just at the present time as to the Washington office."

Discussion of the committee's recommendations brought out the fact that there has been some misunderstanding in the industry as to the purposes of the study which is being made of the association's publishing policy. Chairman Stevens pointed out that the committee's recommendations were predicated on the continuation of the association magazine in a form most useful to the industry and the association. He explained, further, that the object of the committee's recommendation was the co-ordination of the associa-

COMING MEETINGS
OF
Electric Railway and Allied Associations

April 13-14—National Automobile Chamber of Commerce, meeting, Chicago, Ill.

April 20-22—American Society of Civil Engineers, spring meeting, Kenilworth Inn, Asheville, N. C.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

April 27-29—American Welding Society, eighth annual meeting, Engineering Societies Building, New York City.

May 6—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 29-30—Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

tion's activities and that of the existing industrial press.

The executive committee passed the following motion by J. N. Shannahan regarding the policy committee's report:

"I move that the president be authorized and directed to appoint a committee of five to devise, if possible, a plan to carry out the recommendations of the policy committee."

President Sawyer, in commenting on the discussion and the action taken, stated some of the reasons for the changes in policy advocated. He said that the association's object should be to encourage rather than discourage every agency working constructively in the industry's interest.

For the committee on membership, C. R. Ellicott, chairman, reported the transfer from associate to operating membership of the Illinois Traction System, Springfield, Ill. In addition, one new associate member, five new manufacturer members and 83 individual memberships were reported. A sub-committee on special assignments has been appointed to co-operate with the membership committee, as follows: C. L. Bardo, vice-president American Brown Boveri Electric Corporation; L. C. Brown, vice-president Elwell-Parker Electric Company; B. I. Budd, president Chicago Rapid Transit Company; C. D. Cass, vice-president Waterloo, Cedar Falls & Northern Railway; A. H. Ehle, vice-president Baldwin Locomotive Works; C. D. Emmons, president the United Railways & Electric Company; C. B. Keyes, district manager railway department, General Electric Company; M. B. Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company; L. H. Palmer, vice-president and general manager Fifth Avenue Coach Company; Paul Shoup, president Pacific Electric Company, and J. N. Shannahan, Old Dominion Land Company, Newport News, Va.

Harry Reid, chairman of the committee on national relations, reported the serious illness of C. L. Henry, who had charge of the work at the Washington office. On motion of Mr. Coates, the secretary was instructed to write a letter to Mr. Henry expressing the committee's regret at his illness and hoping for his speedy recovery.

Concerning the work of the sub-committee on depreciation, J. H. Hanna, chairman, said that one meeting had been held to consider the situation in the electric railway industry. A hearing on the depreciation question before the Interstate Commerce Commission is scheduled for May 22. Mr. Hanna said that a second meeting of the committee would be held in Chicago on April 6, at which time a form of questionnaire will be decided upon and the general policy to be advocated by the committee will be determined.

Regarding the Charles A. Coffin Prize, President Sawyer, speaking as chairman of the committee, said that "Electric Railway Practices, 1926" is just about completed and ready for distribution.

Mr. Vickers, economist of the association, made a brief report for the committee on taxation. He said that progress on the work of the taxation committee is being held up pending determination of the attitude to be taken by the National Electric Light Association and the American Gas Association.

Supplementing the action taken at the last executive committee meeting in Toledo, at which time the presidents or authorized representatives of state and sectional associations were made eligible to meet with the executive committee, F. R. Coates, chairman of the committee on co-operation with sectional associations, suggested that the president of the community section in the locality in which the executive committee meeting is held be invited to attend. This suggestion was adopted.

C. E. Morgan, chairman of the finance committee, read a report by the auditors regarding the association's finances. President Sawyer explained that work of the finance committee is held up to a certain extent pending final decision regarding the policy to be followed in connection with various phases of the association's activities.

EXHIBITS TO OPEN SATURDAY NOON

A report of the exhibit committee outlining the progress of plans for the coming convention at Cleveland was read by F. B. Bullock, representing J. H. Alexander, chairman. There were available for the inspection of the executive committee diagrams prepared by the exhibit committee and showing the space layouts for the Cleveland convention. A proposed new building to be located between the main auditorium and the west wing, just off the esplanade between the two buildings, is expected to be available for the meetings of the American and the Transportation and Traffic Associations. Space is to be provided in exhibit hall for the meetings of the Engineering, Claims and Accountants' Associations. It is expected that this arrangement will make the remaining space in exhibit hall more attractive for exhibit purposes. C. E. Morgan, vice-chairman of the exhibit committee, outlined to the executive committee some of the plans that are being made in connection with the exhibit. He called attention particularly to the recommendation that the exhibits be opened at 12 o'clock noon on Saturday, thus giving early delegates an opportunity of inspecting them before the official opening of the convention on Monday. The executive committee approved this plan, also fixing Wednesday as the day set aside for the inspection of exhibits. The convention will close on Friday noon as heretofore. The rate for inside exhibit space was fixed at 75 cents per square foot. T. W. Casey was appointed by President Sawyer as chairman of a special committee of manufacturers to represent the views of exhibitors and to form an official point of contact with the exhibit committee.

Additional hotel space to be available at Cleveland this year was listed by Paul E. Wilson, chairman of the hotels committee. The procedure followed last year of making all room assignments through this committee is to be followed again. Approval of the contract with the Cleveland convention committee was reported by T. A. Kenney, chairman of the sub-committee on contract.

Regarding the Anthony N. Brady Memorial Medal, Mr. Storrs said that circulars outlining the contest are being sent out to all electric railway companies by the Museum of Safety.

The following were appointed as delegates to the annual meeting of the U. S. Chamber of Commerce to be held in Washington May 3-5: J. N. Shannahan, national councillor; F. R. Coates, Edward Dana, W. A. Draper, C. D. Cass, E. C. Faber, W. F. Ham, R. P. Stevens, S. B. Way and F. H. Wilson.

Alternate delegates who have accepted are as follows: J. H. Hanna, substitute national councillor; H. L. Brown, H. C. Clark, S. J. Cotsworth, C. R. Ellicott, J. W. Hancock and B. A. Hegeman, Jr.

Delegates were also appointed to attend the National Conference on City Planning to be held in Washington May 9 and are as follows: J. H. Alexander, J. P. Barnes, C. D. Emmons, Thomas Fitzgerald, J. H. Hanna, A. T. Perkins, W. W. Wysor.

Presidents of sectional associations in attendance were welcomed by President Sawyer and responded by expressing their desire to co-operate heartily in the work of the American Association.

The next meeting of the committee will be held in New York on Friday, June 3.

Rolling Stock

PROGRESS reports were made at the second meeting of the rolling stock division of the American Electric Railway Engineering Association held in Detroit, Mich., March 10 and 11. Those present at the meeting were: A. T. Clark, chairman; W. S. Adams, C. Bethel, W. C. Bolt, R. S. Bull, J. M. Bosenbury, F. J. Foote, R. W. Cost, R. A. Hutchins, M. R. Hanna, T. H. Nicholl, E. S. Sawtelle, R. B. Smyth, W. G. Stuck and H. S. Williams.

The report of the special committee on revision of manual sections contained an outline of the work accomplished so far. Decisions have been reached in regard to revision of certain dimensions of brake shoes and work is being done looking to the revision of the specification of steel axles and wheels. Information is being tabulated regarding couplers in use by various interurban railways and manufacturers will be invited to submit suggestions for revision of the test specifications.

The committee on improvements in car equipment made a skeleton outline of the work which is being covered by this committee and the committee on lighting submitted a progress report with blue prints covering various methods and tests which will be made.

The chairman of the committee on roller bearings reported that a meeting of this special committee was held March 9, at which very thorough discussion was made on the various phases of roller bearing construction. It was decided to send out a questionnaire to obtain additional information.

Special committee No. 6 on lubrication reported that a questionnaire has been sent out to various electric railway men and so far 52 per cent have answered. A test of lubrication will be made by the use of a dynamometer. Progress reports were also submitted by the committees on suction strainers for air compressors and on motor brushes.

The chairman of the special committee on noise reduction submitted a description of the work done by this committee. It is expected that the noise measuring instruments will be used in connection with several new truck constructions which have been designed to reduce noise.

The committee on gearing is making a study of tolerances with the idea of introducing certain revisions in this specification. A questionnaire has been sent out by the special committee on current collecting devices and work on this subject is going forward. Progress reports were made by special committees on journal boxes and on limits of wear. In regard to this latter committee, it was decided that the limits of wear to be taken into consideration are axle bearing wear, axle bearing housing wear, axle wear, armature shaft wear, armature bearing housing wear and armature bearing wear.

Humanitarian Motive Predominates in Safety Work

PREVENTION of accidents was the theme of a meeting of the Metropolitan Section, A.E.R.A., held on April 1 at the Engineering Societies Building, New York City. More members were present than at any previous meeting this season. James P. Barnes, president Louisville Railway, spoke on the safety methods used by his company and the good results obtained. The difficulties confronting this railway were brought out when he mentioned that his company operates 14,000 cars every day across steam railroad tracks at 84 different locations.

Safety work was first undertaken for economic reasons. At that time the company was spending 7½ per cent of its gross revenue for accident claims. Now this has been reduced to 4 per cent. It is not the economic side of this achievement, however, which is most gratifying to the management, but the humanitarian side.

When it was first decided to inaugurate a definite movement for the reduction of accidents, the principle was accepted that human failure is back of every accident. The first step was the organization of a safety council among the employees of the railway. Following that a challenge was issued by the men at one carhouse to the men at all other carhouses to see which group could operate during one entire month with the fewest number of accidents per 1,000 car-miles. This proposition originated with the employees but secured the immediate approval of the officials. As a result of this challenge and its acceptance it became necessary to decide upon some classification of accidents and the responsibility for them. The company adopted at that time and has since adhered to the definition that any accident which might reasonably have been prevented by the exercise of care on the part of a trainman is to be charged against him.

From this beginning the work of accident prevention has progressed into a comprehensive and continuing program which covers the entire property. At the start one accident occurred for every 1,800 car-miles operated. It was decided that this must be cut down to one-tenth of that figure. The goal was reached in January, 1927, when the company had only one accident for every 19,000 car-miles operated. The high record for a single month last year was one per 76,000 car-miles.

Together with other organizations interested in accident prevention work, the Louisville Railway some time ago sponsored the organization of a Life Savers' Club among the drivers of commercial vehicles. Any one who has operated a commercial vehicle in the streets for an entire year without being involved in a single accident is eligible for membership. At the present time there are 219 railway motormen among the members.

In conclusion, Mr. Barnes emphasized the changed conception of safety work, saying that the program which was undertaken as an economic measure had ended by becoming a humanitarian movement. Nothing does more, he said, to create a bond between the officials and the men than their common interest in safety work.

James J. Duffy, supervisor of the school of instruction Brooklyn-Manhattan Transit Corporation and Brooklyn City Railroad, outlined the accident prevention work of those companies. He explained the bonus plan that has been in effect for the past eight months and said that the total number of accidents had been reduced from 9,518 for a corresponding period the year before to 8,275 under the new plan.

Chester Briggs, a motorman of the New York Railways, spoke on the care necessary in the operation of cars on Broadway, New York City. He emphasized the point that accidents do not "just happen" but are caused by negligence. During the past fifteen months accidents have been reduced 14 per cent on the Third Avenue Railway System, according to William E. Foley, director of claims. Harry C. White, supervisor of industrial relations Edison Lamp Works of the General Electric Company, said that safety is largely a matter of salesmanship by executives. Anything can be accomplished if a sufficiently determined effort is made. He told of certain experiences he had had with Charles P. Steinmetz and stressed the success attained by this great genius in overcoming almost insuperable obstacles.

Before the commencement of the regular program, T. R. Langan, president of the section, introduced W. H. Sawyer, president American Electric Railway Association, and Daniel Durie, president American Electric Railway Engineering Association. Mr. Sawyer told the members that the job before them today is too big to permit telling of hard luck stories. Too much is at hand waiting to be done to waste time in that manner. The complexity of transportation problems today, he said, creates an unprecedented opportunity for the men in the industry.

Brady Safety Medals Again Offered

FOR the first time in ten years the Anthony N. Brady medals are being offered. At the request of the American Electric Railway Association the contest is being conducted by the American Museum of Safety, with headquarters at 130 East Fifteenth Street, New York City. The next award is to be for the year ended Dec. 31, 1926.

A committee on the award has been appointed, consisting of Lewis Gawtry, president the Bank for Savings, chairman; Col. A. B. Barber, James H. McGraw and Lucius S. Storrs. A committee to determine the conditions of the competition has also been named, consisting of Thomas Fitzgerald, vice-president Pittsburgh Railways, chairman; H. K. Bennett and C. H. Evenson. The plan of award has been somewhat modified. There are to be three medals, as formerly, but each to be given as a first prize to railway organizations, as follows: Gold medal, for electric railways operating more than 5,000,000 vehicle-miles; silver medal, for those operating more than 1,000,000 but not over 5,000,000 vehicle-miles; bronze medal, for those operating less than 1,000,000 vehicle-miles. The committee of award may also, in its discretion, make honorable mention of one or more electric railway organizations, based on the same criteria as the award of the medals, or any other factors that may appeal to it as especially worthy of commendation.

The conditions of the award are, in brief, as follows: Every competing company shall include data covering all its electric railway and bus operations without regard to technical ownership. Presentations should cover broadly and as completely as possible all of the factors prescribed. A definite rating will be assigned by the committee to each of these and a grading will be assigned to each company's presentation based upon the relative accomplishments under each heading.

The factors are: (1) The success in gaining good will as indicated by the initiative, skill and enterprise manifested in improved safety conditions; (2) the improved safety conditions that have resulted from original ideas, as well as the extent to which the company has taken advantage of new development of safety in operating and maintenance practice and equipment originating with others; (3) improvements in safety practice that have resulted in reduced maintenance, or greater reliability of service; (4) particular success in conducting a safety program and actually reducing the number and seriousness of accidents; (5) outstanding accomplishments in development of co-operation between management and employees in safety promotion; (6) outstanding accomplishment in measures to promote sanitation and health. All presentations must be in the hands of the American Museum of Safety on or before Aug. 1, 1927. Details may be obtained from the American Electric Railway Association.

The News of the Industry

Enabling Legislation in Philadelphia

A bill has been introduced in the Pennsylvania Senate to empower the city of Philadelphia to take over the Philadelphia Rapid Transit Company's underlying properties under condemnation proceedings, but requiring a vote of the people. The measure has the approval of Charles S. McChord, utility expert engaged to investigate the transit situation by the Public Service Commission. The proposed new legislation is considered necessary. The bill would permit the city to acquire the underlying companies without taking over the Philadelphia Rapid Transit Company, whereas under the existing Hecht law it is said both the franchise holding companies and operating company would have to be taken over under condemnation proceedings.

The recommendations contained in the McChord report were the subject of a brief review in the ELECTRIC RAILWAY JOURNAL for March 26, page 584.

Another Coffin Contest Announced —Grand Rapids

Plans are being made by Vice-President and General Manager DeLamarter to have the Grand Rapids Railway, Grand Rapids, Mich., enter the contest for the Charles A. Coffin award for 1927. In its house organ, the *Token*, for March, the company says in part:

> All of which means that from now until July 15 the Grand Rapids Railway must be one of the best, if not the best, in the United States. Many visitors will be inspecting the property, riding the new coaches to determine their superiority over the old style cars, and also to get first-hand information on the kind of service and courtesy we are giving the public. In fact, it means that all of us must be on our best behavior and give the best service possible to prove our brief.
>
> In trying for this award there must be co-ordinated effort. Each of us must give the best in us to improve the service. By pulling together employees of the Grand Rapids Railway can prove that all of the good things broadcast about us are in everyday practice on our system. And the reward may be establishing our company as the best of its size of any in the United States.
>
> Let's go out and win it!

Baltimore Line Takes Advantage of Gas Rebate

The United Railways & Electric Company, Baltimore, Md., will take advantage of a rebate of 1 cent per gallon on the state gasoline tax which became effective on April 1. Two new laws passed by the Maryland General Assembly add 2 cents to the former 2-cent gasoline tax. Of the increase 1½ cents is for lateral roads in the state and the other ½ cent is to help defray the expense in eliminating grade crossings.

A provision in the law creating the lateral road tax enables the owners of buses, trucks and other vehicles used entirely within the limits of incorporated cities and towns to receive a rebate of 1 cent per gallon on gasoline used by such vehicles. The United Railways & Electric Company operates 50 passenger buses within the limits of Baltimore.

Home Rule Defeated in Chicago

Sight of the local railway problem was largely lost in Chicago's bitterest mayoralty campaign, which ended on April 4. Candidates of both major parties soft-pedaled the issue, but the vote of less than 60,000 for John Robertson, independent candidate, indicates public ownership and 5-cent fare talk was not taken seriously. William Hale Thompson, successful candidate, polled 41,000 more votes than his opponents combined.

The present Mayor, William E. Dever, stood on his record of efforts to win home rule and unify local transportation under a new franchise. Mr. Thompson offered stereotyped promises of a fair deal to all. In his previous administration he sought to cut 8-cent car fares to 5 and in his effort at a political come-back charged that the 1925 city purchase referendum and the present franchise negotiations were evidence of Mr. Dever's subservience to traction interests. Mr. Dever accused Mr. Thompson of displaying favoritism to Mr. Insull by attempting to block the city's fight to lower gas and electric rates and by squelching opposition to the State Commerce Commission's order increasing elevated fares to 10 cents in 1920. Mr. Dever pointed pridefully to his fight on the Barr terminal permit bill and his strong advocacy of the Durso bill, now pending, which would create a local utility commission.

Mr. Robertson flooded the city with sensational literature denouncing New York banker control of the surface line companies and insinuated that the companies had contributed to the campaign of his opponents. He pledged himself to stand by the straphanger and bring about a public ownership referendum.

With the election over it is hoped the City Council will resume consideration of the plans for a franchise settlement, dropped last February. The ray of hope here is not brilliant, for many of the Aldermen seem to be confused by the complexities of the franchise task and a second temporary extension of the franchise of the Surface Lines may be necessary.

Only 15.000 votes stood in the way of adoption of a home rule amendment voted on in Chicago an April 5 on the petition of 260.000 citizens. This amendment would have taken control of all local utilities from the hands of the Illinois Commerce Commission and vested it either directly in the Chicago City Council or in a local commission created by the Council. The measure was fashioned after the state public utilities act and would have taken effect almost immediately.

Paving Relief Bill Defeated in Detroit

The proposed charter amendment designed to relieve the Detroit Department of Street Railways, Detroit, Mich., from the cost and responsibility of paving between the tracks was defeated by an overwhelming majority of the 60,000 voters who went to the polls on April 4. Early returns indicated that the proposition was defeated in at least 75 per cent of the city precincts. The proposed amendment was sponsored by Mayor Smith and the Street Railway Commission.

It was pointed out that the cost of paving between car tracks amounted to between $600,000 and $700,000 annually. The charter amendment as it appeared on the ballot also provided for removing the cost of repaving and watering between the tracks. The measure fixed a rate of fare on the municipal system sufficient to pay:

(a) Operating and maintenance expense exclusive of paving, repaving and watering between tracks.

(b) Taxes on the physical property of the entire railway system the same as though privately owned.

(c) Fixed charges.

(d) A sufficient per cent per annum to provide a sinking fund to pay the principal of the mortgage bonds issued, at their maturity, and such other additional per cent per annum to provide, in the sound discretion of the board, a sinking fund to pay the principle of the general bonds issued as soon as practicable, to the end that the entire cost of the railway shall be paid eventually out of the earnings thereof.

Boston & Worcester Decision in May

The petition of Receiver Miller of the Boston & Worcester Street Railway, Framingham, Mass., in which he seeks to gain authority to operate buses instead of trolleys as he sees fit, was heard a second time before the Supreme Court recently. Representatives of the bondholders of the railway who are seeking to reorganize the road were successful in securing a postponement of the decision in the matter until May 3.

At the hearing it was stated that actual steps in the reorganization proceedings had taken place. The Boston & Worcester Street Railway has bonds outstanding to the amount of $2,460,000, while the Framingham, Southboro & Marlboro line, which is controlled by the Boston & Worcester, has bonds outstanding to the amount of $60,000.

The Boston & Worcester Street Railway reorganization plan proposes formation of a new company to have $252,000 first mortgage 20-year 7 per cent bonds, $756,000 reorganization bonds to be secured by second mortgage,

$756,000 of 6 per cent preferred stock and $1,388,000 common stock. Each depositor, whether a subscriber for first mortgage bonds or not, will receive for each $1,000 bond, plus any accrued interest, $300 face amount of reorganization bonds, $300 par value of preferred stock and $400 par value of common.

Cincinnati's Community Chest Subsidized by Railway

A gold mine of good will was discovered by Hudson Biery, Director of Public Relations of the Cincinnati Street Railway, Cincinnati, Ohio, in the small fare announcement board in the front of the street cars when he converted it into a medium for advertising Cincinnati's social agencies. This board which had established itself in people's minds as the place to find notices of increase in fares, was performing no present service. No change in fares had taken place for more than a year.

Under the heading "Do You Know," a 25-word message is carried in this space for each of Cincinnati's humanitarian enterprises, each one appearing for half a week in all cars. This series of advertisements will last more than a year.

The service-at-cost franchise, under which this system operates, does not permit a cash donation and the advertising, donated to the ninety-two members of the Community Chest, is directed to tell the public what each group is really accomplishing.

A typical message is as follows:

Do You Knbw?

The Salvation Army gave 208,137 meals, supplied 73,854 beds and gave garments, shoes and medical aid to 7,856 in 1926. Individuals helped, 56,045. Aided by the Community Chest.

A small trade mark of the railway appears in the lower right-hand corner as it was the only way of showing that the company was donating the space.

The *Times-Star*, the *Post*, the *Enquirer* and the *Commercial-Tribune* are co-operating by carrying each new message as it appears in the cars.

1928 Calendar Announced by Safety Council

While the present time seems early for 1928 calendars, the National Safety Council has adopted a new policy by producing its calendars ten months in advance in order that its member companies may obtain a supply early.

The calendar is the most artistic ever put out by the National Safety Council. A picture for each month carries a special safety message appropriate to the season. The pictures are by well-known artists and are excellently reproduced. On the reverse side of each sheet is a safety message.

A schedule of prices has been worked out, the price depending on the quantity. Discounts are allowed for early orders and shipment, being greatest at present and reducing monthly until July 1. As is customary, there is a space on the face of the calendar in which the name of the company distributing it may be inserted.

Those desiring further information should communicate with W. H. Cameron, managing director, 108 East Ohio Street, Chicago, Ill.

Corporation Counsel Says Chicago May Bar Downtown Parking

Citing numerous court decisions in which the authority of cities to prohibit the obstruction of the streets by parking has been repeatedly upheld, the law department of the city of Chicago recently presented an opinion on this question to Mayor William E. Dever. A special committee on downtown parking appointed by the Mayor early in January following publication of the $50,000 traffic survey by the Chicago Association of Commerce has had the subject under consideration for several months, but as yet no meetings have been held or other action taken.

It was to ascertain what can be done to restrict parking in Chicago's congested business streets that the opinion was prepared. According to Corporation Counsel Francis X. Busch, who approved the document, "the city council has the legislative power, both in principle and authority, to enact ordinances for restricting in proper cases the use of the streets for parking, standing and storage purposes, where the same is deemed by the Council to impair the use of the streets for the passage and travel of the public, or to interfere with the ingress and egress of abutting property."

Though all such ordinances are subject to judicial review and condemnation when plainly arbitrary or unreasonable, Mr. Busch points out, they must be presumed reasonable and valid until proved to be otherwise, and should therefore be enforced by the administrative and executive officers of the city.

The parking of cars, except for the loading and unloading of persons or goods, is storage and standing, in the opinion of the corporation counsel's office. "Such standing or parking of vehicles upon the streets amounts to the use of the streets for the purpose of storage and not for the purpose of travel," Mr. Busch declared. "It makes no difference whether such periods of storage use continue for a few minutes only or for much longer periods. The character of the use of the streets will not be different whether such vehicles be left unattended or left in charge of a driver or other caretaker awaiting the return of an owner or occupant having general control and direction over the vehicle, nor will the character of that use be changed whether the person so parking shall be the owner or occupant of property abutting on the street, or any other member of the general public."

Among the various authorities quoted by the city attorney was the Illinois Supreme Court.

Legislative Results in New York Considered Disappointing

The day of legislative reckoning in New York State was concluded with Governor Smith's "Finis" on April 7. Some constructive work was done. But the opinion seems to prevail at Albany that the session just closed will go down in history mostly for what it did not accomplish rather than for what it did do. As an instance, all of the gasoline tax bills failed of passage. A measure drawn just before the adjournment of the Legislature imposing a tax of 1 cent a gallon which it was proposed to introduce on the closing day of the session was abandoned by the legislative leaders.

Compulsory motor vehicle insurance for all cars also met with disapproval of the legislative leaders. The bill transferring the provisions of the highway law, in relation to motor vehicles to the tax law, passed by the Legislature, was withdrawn from the Governor due principally to the fact that so many amendments were offered to the highway law which had been passed that to have re-enacted the provisions of the law into a new law might have left a situation whereby the state would have been without any motor vehicle law at all until the Legislature could meet and correct the situation.

Some bills that have become law follow:

Chapter 278 the Bartholomew bill, Assembly print No. 1,456, amending highway law in relation to deposit with commissioner of motor vehicles of number plates of uninsured car.

Chapter 296 the Bartholomew bill, Assembly print No. 1,099, amending highway law in relation to operation of motor vehicle while license is suspended or revoked.

Chapter 271 the Bartholomew bill, Assembly print No. 1,093, amending highway law in relation to motor vehicles carrying passengers for hire.

Chapter 272 the Bartholomew bill, Assembly print No. 1,097, amending the highway law in relation to keeping clean number plates on motor vehicles.

Chapter 274 the Bartholomew bill, Assembly print No. 1,091, amending the highway law in relation to registration fees for trailers.

The Pammenter bill, Assembly print No. 947, as chapter 152, amending the town law authorizing appropriations by the town board for the purchase and maintenance of traffic signals.

Track Space Being Sought for October Convention

Following on the heels of the application of J. R. Blackhall of the Chicago & Joliet Electric Railway for track space to show one of his new cars at the October convention of the American Electric Railway Association, Thomas Conway, Jr., president of the Cincinnati, Hamilton & Dayton Railway, has advised Fred Dell, director of exhibits, that he will also want track space upon which to show at least one or perhaps two of his new cars if traffic conditions permit of the withdrawal of two from service at that time. These care are low-level, high-speed interurbans, designed and equipped for train operation.

By no means does this exhaust the good news. Mr. Dell has also received a letter from H. B. Potter, general manager of the United Railways & Electric Company, Baltimore, making application for track on which he intends again to exhibit one of his articulated cars this year. In addition, and owing to the recent research and development work which the United Railways has been conducting, Mr. Potter has indicated he intends to have inside booth space in which he will show some very interesting models of rheostatic car heaters, automatic slack adjusters, articulated car parts, etc.

These requests for track space at this early date, six months prior to the convention, indicate that the track exhibit will surpass the magnificent showing of 41 car units at Cleveland last year.

Foshay Company Announces the Judges in Advertising Contest

Judges who will decide upon the prize winners in the $5,000 advertising contest of W. B. Foshay Company are B. C. Forbes of *Forbes Magazine;* Col. W. N. Wamsley, manager financial bureau New York *Times;* Edson B. Smith, financial editor Boston *Herald-Traveler;* Harper E. Leech, feature financial writer Chicago *Tribune;* E. C. Hillweg, assistant publisher Minneapolis *Tribune;* Carl W. Jones, general manager Minneapolis *Journal*, and Wilbur B. Foshay, president W. B. Foshay Company.

As announced previously in the ELECTRIC RAILWAY JOURNAL the W. B. Foshay Company, public utility operators, started a contest on Nov. 1, 1926, for the submission of either a series of newspaper advertisements or some other form of advertising such as a folder, single booklet, slogan or other form advertising the W. B. Foshay Company's system of controlling and managing public utilities and selling the securities of these companies. The contest, an open one, closes on April 30 and the prizes will be awarded on June 1, 1927. All advertising material is to be sent to contest editor, W. B. Foshay Company, Foshay Building, 826 Second Avenue, South, Minneapolis, Minn.

Chicago Surface Lines Awards Prizes for Accident Prevention

For the best record in accident prevention of any division of the Chicago Surface Lines during 1926 motormen and conductors at the North Avenue station were awarded first prize at the annual safety dinner of the company in the Congress Hotel, Chicago, on March 3. The award was made by Guy A. Richardson, vice-president, and the large plaque given as first prize was accepted by William Pasche, division superintendent. The second prize, an artistic shield, was won by the Lincoln Avenue division.

The contest, engaged in by all of the twelve divisions of the system, began a year ago and was concluded on March 1. About 500 employees of the company attended the dinner. Among them were the oldest trainmen from the winning divisions, some of whom have been in service for from 25 to 40 years. A new contest was begun to continue throughout the current year.

New Oneida Fares Approved

The city of Oneida, N. Y., having withdrawn its objection to proposed fares on the Oneida line of the New York State Railways, the Public Service Commission on April 1 approved of the following fares on and after May 1:

Between any two points in Oneida, 10 cents.

Between any two points in Sherrill, 10 cents.

Between Oneida and Sherrill and points intermediate thereto, 10 cents.

Between Oneida and Wampsville and points intermediate thereto, 10 cents.

Between Wampsville and Oneida Castle and points intermediate thereto, 10 cents.

Between Sherrill and Oneida Castle and points intermediate thereto, 10 cents.

With the privilege of purchasing three tickets for 25 cents, each to be good between any of the two points named where the fare is 10 cents.

For single trip rides between Oneida and Kenwood, 10 cents.

Fifteen cents per ticket for round trips good between Oneida and Kenwood.

Fifteen cents per ticket for round-trip tickets good between Oneida and Wampsville, but such round-trip tickets to be good only on interurban local cars.

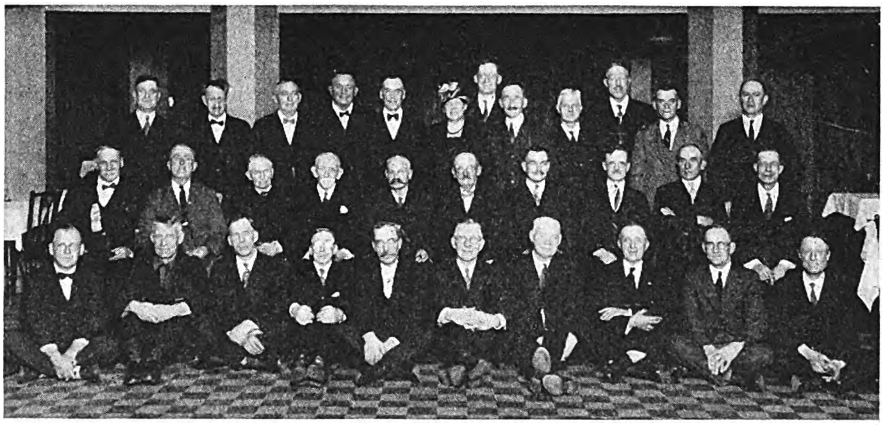
A 30-day 50-trip commutation book for $2.50 between Oneida and Sherrill and also between Oneida and Wampsville, and to cancel the 46-trip school ticket between said points, now sold for $2.75.

Petition for increased fares was filed by the company on April 9, 1926, and hearings held before Commissioners Lunn and Van Voorhis on July 12, 1926, and March 25, 1927. Decision was withheld pending hearings on similar applications filed by the company for increased fares in Rome, Utica and Syracuse. At the hearing on March 25, 1927, the city was represented by Charles R. Coville, city attorney, and at his request the company made certain changes in its proposed schedule. Later the city withdrew its opposition.

Celebrate Twenty-five Years of Service in Salt Lake City

An organization known as the "Quarter Century Club" has been formed by veteran employees of the Utah Light & Traction Company, Salt Lake City, Utah. Every employee with a continuous service record of 25 years or more is eligible to membership, regardless of the department in which he may be employed. Thirty-four members are now enrolled.

The organization of the club was featured by a dinner on the evening of Jan. 28, at which the members were guests of the management. George W. Manning, traffic superintendent of the company, was elected president of the club. G. A. Partridge was chosen vice-president and Miss Flora Manning secretary.



Salt Lake City company honors veterans

Tax Commissioner Renews His Plea for Relief

Electric railways should be absolved from paying costs of paving between car tracks and 2 ft. outside. So said State Tax Commissioner John Merrill on March 9 at the winter meeting of the State Conference of Mayors.

Mr. Merrill spoke somewhat along the lines of his recent utterance in New York, reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 5, page 260.

Awards to North Shore Employees for 1926 Business Tips

More than 500 employees of the Chicago, North Shore & Milwaukee Railroad gathered at the Hotel Sherman in Chicago recently to celebrate with a dinner and appropriate speechmaking the successful completion of the company's Better Business Campaign conducted during 1926.

This event was unusual in the annals of the electric railway industry inasmuch as the North Shore line is believed to be the first transportation organization to enlist its employees in an organized effort to obtain new business. Those present included the individual prize winners, members of the leading teams and their wives and friends.

At the time the campaign was started in January, 1926, the North Shore line management offered $5,000 prize money for those individuals and teams making the best record in securing new passenger and freight business during the year. In the course of the drive a total of 7,714 tips were turned in to the traffic department by 647 employees. Cash prizes ranging from $250 to $10 were awarded 76 employees at the big banquet, which was the award for the leading teams.

The entire North Shore line personnel was organized into teams and each team was assigned a quota of new business each month. The excellent results attained are shown by the fact that the highest team averaged 430 per cent of its quota for the year.

Recent expansion of the company's facilities, including service over the new $10,000,000 Skokie Valley route, purchase of electric refrigerator cars and flat car-trailer equipment, 20 new passenger cars and three new diners and construction of new passenger stations and a $125,000 garage, was the incentive for the increased traffic drive.

As a result of the success attending the first campaign and the splendid effect upon employee morale another drive has been launched for the present year and is already witnessing the establishment of new high records.

A similar campaign of traffic solicitation by employees of all departments was initiated last month by the Chicago, South Shore & South Bend Railroad under the active leadership of Charles H. Jones, general manager.

Increased Wage Sought in New York State

A straight increase of 9 cents an hour for employees of the New York State Railways in Rochester, Syracuse and Utica, N. Y., is demanded by the union in the first negotiations for a new wage and working agreement for the year starting May 1. The demands of the employees, as framed by a joint board of union executives, were read at a meeting of the men in Rochester on April 1. In replying to the demand, James F. Hamilton, president of the railways, said that the increased cost of improvements in the three cities will prevent the granting of the pay boost at this time. Chief among the increased expenses was cited the mounting cost of paving improvements.

The union contends that the recent fare increases in the three cities justify an increase in wages. In Rochester the fare was raised from 7 to 8 cents on Jan. 1, 1925; in Syracuse and Utica the fare has been increased to 10 cents within the past few months.

The present scale for motormen and conductors in cents per hour on two-man cars is 55 cents, on affiliated interurban lines 57 cents and for operators of one-man cars 60 cents.

Further negotiations are under way, with a conference between railway and union officials scheduled for April 20. The contract calls for arbitration.

Rapid Transit Measure for St. Louis Is Dead

The rapid transit enabling act for St. Louis, Mo., died with the Missouri General Assembly on April 2. Major C. E. Smith, consulting engineer for the city, has stated that if the bill was not passed it was virtually useless to talk of constructive steps toward building a rapid transit system for St. Louis until the next meeting of the Legislature in January, 1929. The rapid transit system contemplated would cost upward of $100,000,000.

Under the bill as originally drawn the people of the city were empowered to decide at the polls the way in which they desired to pay for a rapid transit system. As amended the bill requires financing looking toward higher fares.

Downtown property owners were the principal objectors. They claimed that the measure as drawn would have given the Board of Aldermen unlimited authority to assess special benefits against property for the payment of the subway. These property owners want 40 per cent or less assessed against downtown property, the city at large to pay the balance of the estimated $200,000 needed to build a complete rapid transit system.

P.R.T. Consolidates Its Business and Executive Offices

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has leased more than half of the floor space in the new Equitable Building, located at the corner of Broad and Locust Streets. Twelve office floors will house the office forces of the parent company and of its various subsidiaries, while the mezzanine floor will be converted into a bus ticket office and waiting room. In addition Mitten Management has leased the entire twentieth floor for its executive offices. Heretofore the executive offices of P.R.T. and of Mitten Management have been located at 1520 Spruce Street, while the general business offices were at Eighth and Dauphin Streets. Other offices were located in the Land Title Building, the Liberty Building and the *Bulletin* Building. It is understood that all of these are to be relinquished at the time the move to the new location is effected.

Under the new arrangement all officials of the companies will have their offices in the Equitable Building, save for the actual operating supervisors. The transfer to the new building will be made during the current year. The company believes that considerable economies can be effected through the centralization of general and executive office functions.

Louisville Award Presented

The Anthony F. Connelly award for 1926 was presented to Lewis Elmore, motorman, Fourth Avenue carhouse, at the February safety dinner held in Safety Hall of the Louisville Railway, Louisville, Ky., on March 15. Mr. Elmore was selected from among some 50 men of the company as the employee qualified to receive the designation "best public servant." James P. Barnes, president, presented to Mr. Elmore the Connelly award, consisting of the Gold Award Medal, $75 in gold and an invitation to be the guest of the company at the annual convention of the American Electric Railway Association to be held at Cleveland next October. Mr. Elmore has been employed by the company for the past eight years.

Transfers Simplified in Houston

A simplified form of transfer will hereafter be used on the street cars and buses of the Houston Electric Company, Houston, Tex. Carl B. Frazier, superintendent of traffic, says the new transfer has the names of the street car and bus lines grouped into six divisions, exclusive of South End, Kensington, shuttle and car to car changes. Under the new plan the operator will punch the name of the car line upon which the transfer is issued and it will be good on any of the other lines in the city except those named in the same group as the line from which it is issued. It will be good on cars in the same group as the line from which it is issued at the first point of intersection.

Operators will have only to punch the name of the line on which they are working, the time, and if inbound or outbound. Under the old system they punched the line to which the passenger wished to transfer, the line from which the transfer was issued, the date and the time. Each transfer had to be punched as it was called for. Under the new plan the operator can punch a number of transfers at the end of his line sufficient to last him on his inbound trip, and on the outbound trips all he will have to punch is the designation that the transfer was issued while the car was operating outbound.

New Disposition for Lost Articles in Atlanta

A new method of disposing of unclaimed articles found originally on its cars has been adopted by the Georgia Power Company, Atlanta, Ga. The wives, mothers and daughters of the employees are organized into a women's auxiliary, which is again divided into six groups. Each month unclaimed articles are turned over to one of the women's auxiliary circles, which holds an "old hoss" sale. The money thus secured is placed in a special fund for charitable purposes giving the organization a definite and considerable sum for welfare work.

The company found that the old method of keeping the articles for 30 days at the office of the starter resulted in an accumulation of stock which every month or two had to be given over to the Salvation Army or some other organization. Although the honest trainman frequently became the unexpected owner of an unbrella for himself or a bag for his wife, it is said he, too, lost interest in the arrangement.

News Notes

Seek Wage Increase.—Employees of the Sioux City Traction Company, Sioux City, Iowa, members of the Amalgamated Association, are asking a 10 per cent increase in their wage scale, which expired March 1. The scale is now 56 cents an hour maximum down to 51 cents. The company recently increased its fare from 7 cents to 8 cents. One-man cars are used exclusively.

Franchise Law in Missouri Killed.—The proposed perpetual franchise law for Missouri died with the General Assembly on April 4, being on the calendar of the Senate when the final adjournment was taken. The bill had been reported favorably by the Senate judiciary committee, but amended so as not to apply to St. Louis or Kansas City. Public utilities of the state had favored the measure, which was also supported by the Missouri utilities, including the North American Company, the Studebaker organization and many others.

Hearing in Council Bluffs on April 11.—Hearing in the fare case of the Omaha & Council Bluffs Street Railway, Council Bluffs, Iowa, has been adjoined until April 11, giving the city time in which to prepare its side of the case. Four weeks time has been consumed in presenting the railway testimony before Special Master Claude R. Porter in Council Bluffs. The value of the property used in giving service is to be determined and also the rate of return. Then a fare rate will be decided.

Madison Tries Free Ride.—The Madison Railways, Madison, Wis., in conjunction with the city's leading department store, has solved the problem for the store of increasing the number of shoppers during the quiet morning hours. This difficulty was successfully overcome when the store leased the railway system between the hours of 9 and 12 a.m. on March 29. Approximately 2,000 persons were carried free by the company's cars during these three hours. Store officials declared the success of the plan fully merited the expense involved.

Council Approves Rate Increase.—An ordinance raising rates on the Iowa Southern Utilities Company in Burlington, Iowa, from 7 cents to 10 cents for cash fares and the purchase of tickets in blocks of three for 25 cents has been passed by the City Council.

Upholds Paving Order.—The Appellate Division of the Supreme Court at Albany, N. Y., has upheld the order of the State Public Service Commission directing the International Railway, Buffalo, to pave a 2-ft. strip along its tracks in Walden Avenue and in Grant Street and to reconstruct its roadbed in these two streets. The International appealed from the order of the commission, issued in December, 1925.

Applies for Fare Increase.—The Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., has applied to the Missouri Public Service Commission for an increase in rates from 2½ cents to 3 cents per mile effective on May 1. This company operates an interurban between Kansas City and St. Joseph, a distance of 50 miles, and a branch between North Kansas City and Excelsior Springs, a distance of 32 miles. If increased fares are not granted officials of the company state it will not be possible to pay even interest on the outstanding bonds. The estimated receipts for 1927 are $759,279 under the 2½-cent fare and $843,615 under a 3-cent fare. The former figure would fall short by $14,000 of paying interest on bonds.

Ten Cents in Macon.—A 10-cent fare with the privilege of selling four tickets for 30 cents was allowed the Macon Railway & Light Company, Macon, Ga., by a recent decision of the City Council. The old fare was 7 cents. The company was also relieved from paying further paving assessments and permitted a complete change in the routing of its cars so that practically all will have terminals in the downtown district instead of operating from one side of the city to the other. The request in the petition, filed by the company on March 15, looking toward relief of a gross income tax, now amounting to 2 per cent, was denied.

Rebate Slips for Dilatory Coin Dropper.—Because of numerous complaints from passengers who inadvertently or accidentally drop more change than is necessary in the Johnson fare boxes, the Southern Colorado Power Company, Pueblo, Col., is using a rebate slip. Inasmuch as one of the mottoes of the Byllesby organization is "Never forget that your company is a public servant that wants no dollar it does not fairly earn," a system has been devised wherein the operator punches the amount of overpayment, which is collectible by the bearer at the company's offices. Heretofore there has been no practicable way in which the operator could repay the customer as he was charged with all coins registered. The new system protects the operator and avoids ill feeling on the part of the customer.

Recent Bus Developments

Bus Regulatory Measure Before Missouri Governor

The Missouri Senate has passed the amended House bill providing for the regulation of bus lines in the state. The measure is now before Governor Baker, who has stated he will sign it.

The bill places the People's Motorbus Company, St. Louis Bus Company and other lines of the United Railways, St. Louis, under the control of the Missouri Public Service Commission, but the strictly city lines will not be compelled to pay the special bus taxes, nor is the city deprived of the right to control the use of its streets and regulate the use of buses operating within the corporate limits. However, if a St. Louis bus company sought to extend or change its routes it would be compelled to obtain a certificate of convenience and necessity from the Public Service Commission. That body is also given jurisdiction over the fares to be charged by bus companies.

The bill also provides that the Public Service Commission in considering applications for certificates of convenience and necessity for a bus company to operate or extend its lines shall take into account the transportation service being furnished by any railroad, street railway or motor carrier and shall pass upon the likelihood of the proposed service being permanent and continuous.

Oil-Electric Bus Developed in Philadelphia

Experiments in the use of fuel oil in driving gasoline-electric buses are being carried on by Mitten Management in Philadelphia, according to a recent announcement. Apparatus has been devised by which the changeover can be made at an approximate cost of $50 per bus, it is said.

Double-deck bus No. 300 of the Philadelphia Rural Transit Company has been operating on a regular city route for several months equipped with the fuel-oil apparatus. It has run more than 15,000 miles and its mileage per gallon of fuel oil is reported to be slightly in excess of the average miles per gallon of gasoline. The official statement declares that the use of fuel oil will not only effect a substantial saving, due to the fact that its cost per gallon is about one-half that of gasoline, but that it will provide a greater factor of safety because oil is less inflammable than gasoline.

In a report to T. E. Mitten on the subject, J. A. Queeney, vice-president of Mitten Management, under whose direction the fuel oil feature has been developed, had this to say:

> The work has now progressed to the point where we feel confident that our gasoline-electric buses can be successfully operated with fuel oil. The first bus so equipped—a double-deck—is now in regular daily service on Broad Street and up to date has made approximately 15,000 miles. Its general performance is satisfactory.
>
> The engine of the oil-electric bus is started with gasoline and thereafter operates on fuel oil. The change from oil to gasoline is made automatically, no action by the driver being necessary.
>
> While I am not yet ready to recommend that the engines of all our motor buses be arranged for operation with fuel oil, as we still have a number of refinements to make, nevertheless sufficient progress has been made to demonstrate to our satisfaction that it is thoroughly practical to operate on fuel oil, and this work will be carried forward as rapidly as possible.

Blue Goose and Purple Swan End Hostilities

The Purple Swan Safety Coach Lines discontinued its St. Louis to Alton, Ill., service on April 1, abandoning the field to the East St. Louis & Suburban Railway and its subsidiary bus line, the Blue Goose line. To the same railway and bus properties it had previously given a monopoly of the trade between St. Louis and Belleville.

The Purple Swan company opened service between St. Louis and Alton on Aug. 1, fixing its rates at 75 cents for one way and $1.25 for the round trip. The electric railway at that time was charging $1.86 for the round trip. When the competition began to cut heavily into the receipts of the car lines the Blue Goose bus line entered the field as an auxiliary to the street cars. At the same time the round-trip rate on the electric line was slashed to $1, while the service was greatly speeded up.

Following the abandonment of the Purple Swan line from St. Louis to Belleville, the East St. Louis & Suburban Railway on March 27 put into effect a new schedule of street car and bus fares between these two cities. The rates are practically the same as were charged prior to the competition of the Purple Swan line with the Blue Goose Bus Line, operated by the railway. The new rates are: Street cars, 39 cents one way and 60 cents round trip on date of sale and 70 cents for round trip with fifteen-day limit. The bus fare is a flat 45 cents for one way.

Buses Will Supply Service.—Discontinuance within the next 60 days of the interurban line which the Wisconsin Public Service Corporation has been operating at a loss for many years between Two Rivers and Manitowoc was agreed upon at a joint meeting of railway officials and representatives of the two city governments held at Two Rivers on March 24. Four new interurban buses of 25 passenger capacity will be purchased at a cost of $48,000 to supply 30-minute service between the two cities. Bus fares between the cities will remain the same as charged by the interurban, while city fares on buses in Manitowoc will be 10 cents. Interchangeable transfers will be issued to city and intercity patrons without charge. The interurban tracks between Manitowoc and Two Rivers will be replaced with a 30-ft. concrete highway at the expense of the county.

Financial and Corporate

Sale Date at St. Louis Set

Property of Railway There to Be Sold Under Foreclosure Probably by May 12

United States District Judge Faris of St. Louis, Mo., on April 1 ordered the public sale of the United Railways, which went into receivership in April, 1919. He approved the recommendation of Special Master Williams that the property be foreclosed and appointed former Congressman William L. Igoe to conduct the sale. The date for the sale was not fixed by the court, but it is likely it will occur about May 12.

It is almost certain that the only bidder at the sale will be the St. Louis Public Service Company, formed by the reorganization committee to take over and operate the system upon the termination of the present receivership. If the property is sold to the reorganization committee Judge Faris would then be called upon to approve the plan of reorganization.

Under the reorganization plan the common stock will be wiped out, but the preferred stock holders will have the right to purchase the common stock of the St. Louis Public Service Company at $12.50 a share.

Judge Faris has fixed an upset price of $46,600,000 for the property. This is sufficient to cover the entire issue of United Railways general 4 per cent bonds and $2,300,000 of suburban consolidated bonds. There is $30,300,000 of the United Railways general bonds outstanding.

Negotiations between the city officials and J. K. Newman of Newman, Saunders & Company, agents for the reorganization committee, relative to a service-at-cost franchise for the railway were resumed on March 31. Little was accomplished at the March 31 meeting as Mayor Miller told Mr. Newman further conferences would be useless until the Public Service Commission hands down its decision on the company's application for an 8-cent fare.

The reorganization committee desires to earn 7 per cent on a valuation of $60,000,000 for the first five years under a 30-year franchise, but Mayor Miller has been contending the company should accept 6 per cent on a valuation of $51,781,348 as of 1919 fixed by the Missouri Public Service Commission plus additions and betterments of about $6,000,000 since that date. This would make the final valuation about $58,000,000.

It is expected that the Public Service Commission's decision on the 8-cent fare application may also include a recommendation as to whether the city should allow a 6 or 7 per cent return.

Recently when Receiver Rolla Wells went into the federal courts in an attempt to obtain an 8-cent fare at once he contended that the real valuation of the railway property is $75,000,000.

That move indicated that if the city is not willing to accept the $60,000,000 valuation and grant the reorganized company a 30-year blanket franchise under the service-at-cost plan, it is probable the company may enter the courts for the right to obtain a reasonable return upon a valuation of $75,000,000.

Traffic Fare and Wage Figures

While there was a slight increase in the electric railway passenger traffic in February, 1927, compared with February, 1926, the increase was much less than has been generally reported in recent months. This is attributed to the extraordinarily good weather conditions during the month, compared with February last year, when there were a number of severe snowstorms.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 216 companies is as follows:

February, 1927	781,891,790
February, 1926	779,296,724
Increase, per cent	0.33

Average cash fare in cities of 25,000 population and over:

	Cents
March 1, 1927	7.8194
February 1, 1927	7.7827
March 1, 1926	7.65432

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913=100% Per Cent
March 1, 1927	56.97	209.06
February 1, 1927	56.94	208.95
March 1, 1926	56.66	207.93

$279,075 Received from Ottawa Electric in 1926

In the thirteenth annual report of the Ottawa Traction Company, Ltd., Ottawa, Canada, T. Ahearn, president, stated that the amount received from the Ottawa Electric Railway for the year ended Dec. 31, 1926, was $279,075, with which was paid the usual quarterly dividends of 1 per cent and a bonus of 1 per cent.

Following the signing of the new agreement with the city of Ottawa in January, 1924, the company had successfully carried on the rehabilitation and modernizing of its railway system. Every department has been carefully scrutinized and its assets put into first-class condition. With the exception of eighteen cars, all the passenger rolling stock is either new or has been rebuilt along modern lines.

A bus department was organized in 1924 and, the report states, consists of nine 21-passenger Reo buses and an up-to-date garage. Mr. Ahearn states that this department is making steady progress and has already justified its creation.

The new car shops were constructed after a careful study of the latest shops in the eastern part of Canada and the United States and embody the latest ideas in shop design. With the shops is carhouse accommodation for about 50 cars, the whole building being arranged so that as more shop accommodation is required with the growth of the system it can be taken from that part of the building which is now used for housing cars.

The entire construction program, entailing an expenditure of $2,250,000, was carried out without interruption.

Mr. Ahearn says that the efforts of the company during 1926 were directed toward the maintenance of the plant and equipment in an efficient condition.

Character of Missouri Interurban Road's Business Changing

Total gross earnings of the Kansas City, Clay County & St. Joseph Railway, St. Joseph, Mo., for 1926 from operation were $828,176, representing a decrease of $46,239 in comparison with the year 1925. Total net earnings available for interest charges, reserves, etc., for the year 1926 were $222,318, or $35,680 less than in the previous year. After providing for interest on the company's bonds and miscellaneous deductions aggregating $157,358 the year's operations showed net income available for reserves and surplus of $64,959. Of this amount, $17,359 was appropriated for the reserve for depreciation.

During the year $102,000 principal amount of the company's bonds were retired through operation of the sinking fund. There remains in that fund a balance of $50,036 which may be used for the retirement of additional bonds or withdrawn for capital additions to the property.

Approximately 23 per cent of the gross revenues were derived from freight transportation. The character of the freight traffic handled by the road is undergoing a change. There has been a decrease in the less-than-carload or package business due to sharp competition from motor trucks. However, the carload movement has greatly increased. Intensive work is being done to increase joint rates and routes with more of the steam railroads of this territory and to locate along the property of the company active industries productive of carload traffic. The company has physical track connections with the Chicago Great Western, Chicago, Burlington & Quincy and the Chicago, Rock Island & Pacific Railway and indirect connections with all other steam railroads at Kansas City and St. Joseph. Through these facilities approximately 3,500 carloads of freight moved inbound or outbound to or from points on this company's line in 1926. Approximately half of the movement was line haul, and the remainder was handled in switch movement.

Approximately 14,000 cross ties and 170 cedar trolley poles were renewed. More than 400 trolley poles were treated with hot creosote. All track bonding was rehabilitated and twelve passenger cars were overhauled and repainted. In this latter respect a con-

INCOME AND SURPLUS ACCOUNT OF THE KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY FOR YEAR ENDED DEC. 31, 1926

INCOME ACCOUNT

Gross Earnings from Operations:		
Revenue from transportation		$815,34
Revenue from operations other than transportation		12,828
Total gross earnings from operation		$828,176
Operating Expenses and Taxes:		
Operations		$439,472
Maintenance		159,547
Taxes		22,326
Total operating expenses and taxes		$621,346
Net earnings from operations before depreciation		$206,829
Add non-operating income		$15,489
Total net earnings before depreciation		$222,318
Interest deductions		$157,358
Surplus net income before depreciation		$64,959

SUMMARY OF SURPLUS ACCOUNT

Balance, Jan. 1, 1926		$807,93[illegible]
Add:		
Surplus net income before depreciation	$64,959	
Less depreciation of rolling stock	17,395	
Net income after depreciation	$47,563	
Refund of federal income tax for years 1917 to 1921	2,953	
Discount on $102,000 of first mortgage bonds purchased and canceled	51,527	
Total additions		$102,044
		$909,978
Deduct:		
Portion of unamortized bond discount and expense written off	$11,230	
Premium on United States Treasury notes written off	1,218	
Normal tax withheld at source	2,086	
Materials and supplies inventories adjusted	9,344	
Advertising and purchasing expense on canceled bonds	397	
Total deductions		$24,277
Balance, Dec. 31, 1926, per balance sheet		$885,700

siderable saving was effected by substituting a cellular lacquer in lieu of the former paint and varnish method.

The passenger train service furnished by the railroad was substantially the same as that during the past few years, except that on the St. Joseph Division four limited trains were operated, of which two displaced local trains.

The Kansas City, Clay County & St. Joseph Auto Transit Company, which operates bus lines connecting with the company's railroad lines, now has four separate routes, to wit: Kansas City to Excelsior Springs, Kansas City to St. Joseph, Kansas City to Parkville, and, since Dec. 9, 1926, a touring car line between Platte City and the company's railroad line at Ferrelview. Its gross revenues for the year were $120,105. They covered operating expenses, taxes and reserve for depreciation, but provided no return on the capital investment. The details of the revenues of the Auto Transit Company were not included in the income account of the railway.

The company explains that the improvement of the highway between Kansas City and St. Joseph has resulted in a substantial increase in the use of the private automobile, and that as a consequence the railroad suffered from a reduction of 118,971, or 14.4 per cent, in the number of revenue passengers carried on the St. Joseph division. The Excelsior Springs Division, however, recovered some of the loss of passenger business which it has previously suffered from a similar cause, with the result that the total number of revenue passengers carried by the two divisions decreased only 2 per cent.

Net in Duluth Lower

Under New Fare Passenger Revenues Increase in 1926—Improvement Noted in Bus Operation

The net income of the Duluth-Superior Traction Company, Duluth, Minn., for the year ended Dec. 31, 1926, transferred to profit and loss showed a decrease of $23,064 compared with the year previous. This disclosure was made in the annual report to the stockholders. The gross revenues for the year showed an increase of $14,448, and operating expenses, including all taxes, showed an increase of $38,799.

Previous to Oct. 15, 1926, at the 6-cent fare the passenger revenue showed a decrease of $50,867 compared with the corresponding period during 1925. On Oct. 4, 1926, the Railroad and Warehouse Commission of Minnesota filed its order fixing the value of the property of the company in the city of Duluth as of Dec. 31, 1925, at $5,291,710 and the rate of return which the company was entitled to receive on such valuation was fixed at 7½ per cent. The rate of fare which was authorized in the city of Duluth was fixed at 8 cents cash, five tickets or tokens to be sold for 35 cents. The new rate of fare became effective on Oct. 15, 1926. From Oct. 15 to Dec. 31, 1926, under the new rate the passenger revenue shows an increase of $25,342 when compared with the corresponding period in 1925.

STATISTICAL STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY

(Street railway only)

	1926	1925
Total revenue	$1,888,303	$1,905,001
Total operating expense including depreciation	1,508,472	1,494,898
Net revenue	379,831	410,102
Revenue passengers carried	29,254,508	30,638,092
Transfers redeemed	5,031,592	5,309,085
Operating, per cent of revenue, taxes included	86.73	85.58

COMPARATIVE STATEMENT OF RAILWAY OPERATING REVENUES*

1917	$1,621,952
1918	1,665,909
1919	1,937,142
1920	1,919,579
1921	1,777,330
1922	1,784,774
1923	1,904,606
1924	1,789,402
1925	1,873,013
1926	1,849,463

*Above comparative statement has been made to conform with the Interstate Commerce Commission's classification of accounts. Non-operating income not included.

Depreciation has been accrued and charged monthly to operating expense at the same rate as the previous years, with the exception of the property comprising the Duluth, Minn., Division for the months of October, November and December. During these months depreciation on the Duluth Division has been accrued and charged into operating expense at the rate of $100,000 a year as provided in the order of the Railroad and Warehouse Commission of Minnesota dated Oct. 4, 1926.

TRACK MILEAGE AND PASSENGER EARNINGS PER MILE OF THE DULUTH-SUPERIOR TRACTION COMPANY

(Street railway only)

Total miles, single track	16.94
Total miles, double track	44.64
Total miles, special track	6.15
Total miles, all track reduced to single	112.36
Average total miles, all track reduced to single, operated during 1926	110.39
Total miles of street and right-of-way occupied by tracks, 1926	61.58
Average total miles of street and right-of-way occupied by tracks, operated during 1926	60.37
Revenue from transportation, per mile single track	$16,604.37
Revenue from transportation, per mile street occupied by tracks	$30,362.05
Revenue from transportation	$1,832,956.77

A. M. Robertson, president, stated that the management hoped to have the charge for annual depreciation of the property in both Duluth, Minn., and Superior, Wis., fixed and accrued upon a percentage basis which would be uniform in both states instead of a percentage basis in one state and a flat annual amount in the other.

The amount accrued to depreciation reserve during the year 1926 was $194,760. There was expended for renewals and charged against depreciation reserve the sum of $48,402. There was expended for additions to property during the year the sum of $116,801.

Bus service operated as feeders to railway lines has been fully justified, according to Mr. Robertson, and affords a means of supplying transporta-

CONSOLIDATED INCOME STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY*

	1926	1925
Operating revenues:		
Revenue from transportation	$1,934,636	$1,928,624
Revenue from other operations	16,506	14,868
Total operating revenues	$1,951,142	$1,943,493
Operating expenses:		
Way and structures	$213,616	$209,908
Equipment	235,637	225,193
Power	176,183	178,704
Conducting transportation	746,487	729,398
Traffic	1,526	2.521
General and miscellaneous	260,065	243,109
Transportation for investment-credit	—11,384	—10,832
Total operating expenses	$1,622.131	$1,578,012
Net revenue from operations	$329,011	$365,480
Taxes assignable to operations	$133,974	$139,294
Operating income	$195,036	$226,186
Non-operating income:		
Income from funded securities	$22,284	$15,169
Income from unfunded securities and accounts	2,425	2,456
Income from sinking fund and other reserves	14,091	13,980
Miscellaneous income	67	465
Total non-operating income	$38,869	$32,070
Gross income	$233,906	$258,256
Deductions from gross income:		
Interest on funded debt	$169,664	$171,054
Interest on unfunded debt	2,740	2,736
Miscellaneous debits	704	604
Total deductions from gross income	$173,109	$174,395
Net income transferred to profit and loss	$60,796	$83,861

*The above income statement includes the results from the operation of the street railway system and motor coaches.

tion service to sparsely settled districts which could not support a railway. The earnings from bus operation during the past year have not been satisfactory, but a steady improvement has been shown and the year 1927 should show still further improvement.

During the year one railway extension of 2.63 miles of track was built in Duluth. This extension is known as the Crosley Avenue line and was put in service on Oct. 1, 1926.

No general mortgage bonds were authenticated or sold during the year, while $28,000, par value, of general mortgage bonds were retired under the sinking fund provision of the mortgage.

The report goes into some detail on the status of the appeal of the city of Duluth to the United States Supreme Court from the order and decision of the United States District Court and the appeal of the city of Duluth from the decision of the District Court of St. Louis County.

Revenue at Youngstown Holds Up Well.—The revenue of the Youngstown Municipal Railway, Youngstown, Ohio, during January was $184,679, compared with $185,393 for a similar month of 1926. During the first month of the year the revenue failed by $10,762 of paying all expenses, including a return on the investment.

Will Remove Tracks. — The Pacific Electric Railway has been granted permission by the California Railroad Commission to abandon and remove the tracks on its San Antonio Heights Line in the county of San Bernardino.

Files Abandonment Petition. — The New York & Stamford Railway filed a petition on April 4 with the Public Service Commission asking for the approval of a declaration of abandonment of its railway lines in the village of Port Chester, Westchester County, on North Main Street from Mill Street to the state line between New York and Connecticut. A public hearing will be held on this petition. This is part of the plan for readjustment to which reference has been made before in the JOURNAL.

May Reimburse Treasury.—The Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission, in a supplemental order, to use $175,740 of the proceeds received from the sale of bonds heretofore authorized by the commission to reimburse its treasury.

Revenue in San Diego $1,667,519.—The San Diego Electric Railway, San Diego, Cal., reports to the Railroad Commission its 1926 operating revenue at $1,667,519, compared with $1,608,501 for 1925. The operating expenses, excluding taxes for 1926, are reported at $1,350,373, and at $1,405,130 for 1925, leaving net operating revenue of $317,146 for 1926 and $203,371 for 1925. During 1926 taxes charged to operation amounted to $113,828 and for 1925 to $106,583. Deducting the taxes leaves operating income of $203,318 for 1926 and $96,788 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $303,888 for 1926 and $175,822 for 1925.

Net Income Lower.—For the eight months period ended Feb. 28, 1927, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $7,518,803, against $7,486,575 for a similar period last year. Operating expenses and taxes increased from $6,394,466 for the eight months period ended Feb. 28, 1926, to $6,542,038 for the 1927 period. After the consideration of income deductions a net corporate income remained this year of $766,626, against $930,680 in the eight months period ended Feb. 28, 1926.

Service Discontinued.—The Sacramento Northern Railway has been granted permission by the California Railroad Commission to discontinue passenger service over its Suisun-Vacaville branch in the county of Solano. The commission found that the service was not required by public convenience and necessity.

Abandonment Petition Dismissed.—Application of the Utah-Idaho Central Railroad for permission to abandon its passenger service between Ogden and Plain City, Utah, has been dismissed without prejudice by the Utah Public Utilities Commission.

Rail Lines at Tampico to Discontinue.—All of the railway lines of the Tampico Electric Company, Tampico, Mexico, except the one which runs from Tampico to the beach resort suburb of Miramar, were shut down on March 14. Whether or not the suspension will be permanent will depend on future conditions. Should there be no indications of improvement in patronage, the tracks will be taken up and the rails along with other equipment sold, it was stated. The Tampico Electric Company is owned by British interests.

New Directors Elected.—Harold J. Gallagher, New York, and W. Graham Boyce, vice-president of the Union Trust Company, were elected directors of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., at the recent annual meeting. They succeeded J. H. Beatson and R. W. Graham, Baltimore.

Cable Road Reports.—The California Street Cable Railroad, operating in San Francisco, reports to the Railroad Commission its 1926 operating revenue at $532,537, compared with $557,858 for 1925. The operating expenses, excluding taxes for 1926, are reported at $462,344, and at $412,082 for 1925, leaving net operating revenue of $70,193 for 1926 and $145,776 for 1925. During 1926 taxes charged to operation amounted to $49,858, and for 1925 to $49,405. Deducting the taxes leaves operating income of $20,334 for 1926 and $96,370 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $41,869 for 1926 and $117,624 for 1925.

Net Income Up in St. Paul.—Total operating revenue of the St. Paul City Railway, St. Paul, Minn., for February was $391,008 compared with the January income of $428,574 and a total revenue of $402,566 for February, 1926. The operating expenses were $280,881, compared with $299,216 for the similar period a year ago. Operating expenses for February, 1927, were cut nearly $19,000 below similar expenses in February, 1926. Because of the sharp reduction in operating costs, the net income of the company for February, however, showed an increase of approximately $7,500 over the income of the corresponding month a year ago, despite a drop of $11,500 in total operating revenue. Net income for February was $24,575, after all deductions for taxes, operating expenses and miscellaneous debits had been made.

Would Dispose of Property.—The Pacific Electric Railway has applied to the California Railroad Commission for permission to sell its resort property in the city of Redondo Beach, Los Angeles County, valued at $1,800,000, to T. R. Gardner for a corporation to be chartered for the purpose of taking over and operating the property and designated as the Amusement Company. The Pacific Electric Railway has also requested permission of the Railroad Commission to dispose of certain real estate located along its Newport Beach Line in the city of Long Beach and in the city of Seal Beach, valued at $126,000.

Slight Earnings Decrease on Indiana Road.—The net income of the Terre Haute, Indianapolis & Eastern Traction Company for 1926 shows a decrease of $14,988 under the net income for 1925, according to a financial statement of the company filed with the Indiana Public Service Commission. The net income for 1926 was $137,929. Operating revenue was $3,155,296. Operating expenses were $3,129,919. The gross income was $1,185.513. The report shows, among deductions, $676,897 interest on the funded debt and $55,847 interest on unfunded debt. The total valuation of the property is $18,200,000.

Offers New Prior Lien Issue.—The first public offering of 6 per cent cumulative prior lien stock of the Midland Utilities Company, Chicago, Ill., was made March 24. The Midland Utilities controls the Chicago, South Shore & South Bend, the Gary Railways and Indiana Service Corporation. A new issue of 25,000 shares of this stock has been authorized and 15,000 shares is being offered to investors by the Utility Securities Company, Chicago, and the Central States Securities Corporation, New York. The additional 10,000 shares, which will be offered in the near future, take the place of 10,000 shares of 7 per cent prior lien stock which was repurchased and converted into 6 per cent stock. The stock is being sold at $92.50, to yield about 6.50 per cent. Dividends on other prior lien and preferred stocks are payable at the rate of 7 per cent annually. The new 6 per cent prior lien stock is on a parity in all respects with the 7 per cent prior lien stock except as to the annual dividend rate and the callable price, which is $110 per share.

Book Reviews

Profit Sharing and Stock Ownership for Employees

By Gorton James, Henry S. Dennison, Edwin F. Gay, Henry P. Kendall and Arthur W. Burritt. New York: Harper & Brothers. 394 pages. Price $4.

Profit motive is a strong force. As the authors point out, it may well be utilized in some one of its manifold forms as an agent of efficient management and of social betterment. The point of the present volume, however, is not only that it can and should be so used, but that its application demands an understanding of its principles and an analysis of the situation it is meant to fill.

Within these pages is a study of principles. There are no recommendations of ready-made plans, since, as the authors say, no plan is uniformly applicable to all situations. The hope of the authors is merely that the book will help managements to find the points of usefulness of profit sharing as well as to recognize the places in which it is not effective.

The present volume really is the successor to "Profit Sharing, Its Principles and Practice," published in 1918. That book has, in the present volume, been entirely rewritten, for since its publication there has been a steady and continued interest in the subject, while at the same time the business world has gone through changing conditions which have tested the various plans and revealed in many ways their points of weakness and strength. Moreover, there has recently been a wide use of employee stock participation to serve equivalent purposes if not identical ones.

The authors say that the principal conclusions of the former volume as to the great strength of the profit motive, when effectively applied, have been sustained and strengthened by the facts of experience, but that there has been some modification of previous conclusions regarding specific applications of the principles. Especially has it been proved that profit sharing and management sharing are very closely interdependent, and this fact has led to the addition of several chapters to the present edition. Furthermore, the use of stock participation has been studied, in so far as it has been used in place of profit sharing, or for the same purposes, and this subject has formed the basis for three additional chapters. The volume is wide in its appeal to railway executives.

What a Business Executive Should Know About Patents

By Roger Sherman Hoar, head of the patent department of the Bucyrus Company. New York, N. Y.: Ronald Press Company, 1926. 22 pages, bound in paper. 6x9 in. Price $4.50.

All things considered, the author has achieved well his object to prepare a treatise on tactics plus a translation into plain English of so much of the patent law as will enable a business executive to understand his attorney and to co-operate fully with him. This is said even with the fact in mind that the "business executive" is the one in charge of a manufacturing business and not the head of a transportation business.

With this end in mind the emphasis of the author is placed on patent applications, interferences and searches and on the contractual arrangement desirable in case of licenses. Considerable attention is paid to the problems of the inventor, the employer and employees, the right to repair patented machines and to the shop rights that may be developed when an employee has invented something that may be built outside. The chapters on infringements and on the choice of an attorney discuss many practical matters not usually put down on paper, but still of importance to any one interested in the patent question. In conclusion, the author summarizes a number of misconceptions about the whole matter far too prevalent even among those who are not without experience in dealing with patent problems.

Street Railway Transportation in Cincinnati

By Rebecca Van Hamm. Vocational Pamphlet of the Cincinnati Public Schools, No. 6. 64 pages.

Did you ever want to be a motorman when you were a boy? "Street Railway Transportation in Cincinnati" opens up new vistas of thought for the high school boy of today in choosing a life work, and it goes into the fields of mechanical, electrical and civil engineering. In fact, the story of railway transportation in Cincinnati is the sixth of a series of vocational studies for junior high school boys and girls, presented in pamphlet form and published by the Board of Education of Cincinnati, and the first of the public utilities in this series to be discussed. It develops all of the allied vocations in every line connected with the electric railway industry. Its author, Miss Rebecca Van Hamm, has brought together two great civic bodies, the Cincinnati Street Railway and the Board of Education.

She has shown the student his relation to the community through the very car on which he rides to and from school. How many more advantages he has today than his father yesterday are told in the introductory chapter. Health and safety of the workers whom he meets every day, the various organizations with which they are connected, how they are at work in constructing lines, their duties in the carhouses, shops and power stations; how they are instructed before they are allowed to go out on their new jobs; how they spend their moments of recreation in the shelter rooms; how their wages are determined; how many passengers ride on the cars every day, and statistics of the transportation department's functioning are all woven into this brief text and portrayed by pictures and charts.

In the glimpse into the future, the author asks the question, "How shall we come to town, or ride to school 25 years from today?" The student will be better prepared to think along these lines after reading some of the books and magazines appendixed to the text in the bibliography.

Switching Equipment for Power Control

By Stephen Q. Hayes, A.B., E.E., general engineer Westinghouse Electric & Manufacturing Company. Second edition. New York, N. Y.: McGraw-Hill Book Company, Inc. 556 pages. Price $5.

Progress in the design of generators, transformers and other electric machinery since the first edition of this book has made it desirable to bring the contents abreast of present practice. A number of European ideas have also been incorporated in the revision.

In America there has been a great development of the steel-clad switchgear, represented by truck panels, truck type oil circuit breakers, steel switchhouses for outdoor service and steel switchboards. In the second edition of this book a separate chapter has been devoted to these advances. A separate chapter has also been allotted to automatic substations so as to take care of the advances made in automatic railway substations, also automatic stations for d.c. light and power, substations for mining service, automatic hydro stations and similar automatic equipment. There is a discussion of supervisory control and a certain amount of information for load dispatching. The tying together of neighboring power systems has introduced many interesting problems connected with voltage adjustment and regulation by means of induction regulators, step induction regulators and ratio adjusters or tap changers to permit change of transformer ratio under load. A chapter is devoted to this subject.

The author describes the switching apparatus approximately in the order in which the various devices were developed and then proceeds to the consideration of the main connections desired in a power plant and the means of carrying them out so as to obtain the maximum amount of security and flexibility with minimum outlay. Switchboard panels, control desks, etc., are considered next with the location of breakers, bus structures, etc. Description of apparatus has been confined almost exclusively to present-day standards.

Employment Statistics for the United States

By Ralph C. Hurlin of Russell Sage Foundation and William A. Berridge of Brown University. 215 pages. Price, $2.50.

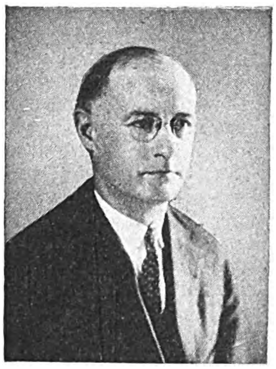
This is a plan for a national collection of statistics and a handbook of methods recommended by the committee on governmental labor statistics of the American Statistical Association. It presents the consensus of opinion of the members of that committee concerning problems involved in the collection and publication of adequate employment statistics for the United States.

Personal Items

Stone & Webster Confer Honor

In Promotion of Messrs. Clifford, Burke, Townsend, Wentworth, Management Recognizes Long Service Records—Careers of New Incumbents Reviewed

SINCE April 1 the Boston office of Stone & Webster, Inc., has been enriched by the services of George H. Clifford, who was recently appointed division manager in charge of the companies located in the Southwestern district, the Virginia Electric & Power Company and subsidiaries and the northern district properties of the Eastern Texas Electric Company. This change, along with several others, was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 5, 1927, page 438.


W. H. Burke

G. H. Clifford

A. S. Townsend

Mr. Clifford brings to his new position a record of valuable experiences, gained mostly on the Stone & Webster properties. About 26 years ago he entered the service of the Northern Texas Traction Company as secretary to F. M. Haines, general manager of the company, owned by the Bishop & Sherwin syndicate of Cleveland. Two years later Mr. Clifford was made secretary and treasurer. He held this position until 1905, when the property was purchased by Stone & Webster. After the change in ownership he was made general superintendent and in 1910 was elected vice-president and general manager of the Northern Texas Traction Company and in addition general manager of the Fort Worth Southern Traction Company, operating 32 miles of interurban line between Fort Worth and Cleburne. A little less than two years ago Mr. Clifford was made Southwestern district manager over all Stone & Webster properties in Texas, Louisiana and New Mexico. The properties involved embraced companies with many diversified interests, but his talents proved equal to the responsibilities imposed upon him. Mr. Clifford was born at Fort Worth in 1881. He was graduated from the public schools and attended Weatherford College.

Walter H. Burke, the new district manager in the Southwestern district, was appointed less than two years ago manager of the Northern Texas Traction Company of Fort Worth and the Tarrant County Traction Company. He went to Fort Worth at that time from the Houghton County Traction Company as successor to Mr. Clifford. Mr. Burke, too, has been identified with the Stone & Webster organization for many years. He entered the statistical department at the Boston office in 1910, remaining there for a year.

In 1911 he was sent to Dallas as clerk to E. T. Moore, then manager of the Dallas group of utilities under Stone & Webster management. Later he left Stone & Webster to go to Milwaukee and assumed the position of manager of the light and power operations of the Milwaukee Electric Railway & Light Company. However, in 1915 he was back again in the Boston office of Stone & Webster as assistant to M. M. Phinney, who was vice-president of the Stone & Webster Management Association. His next move was to Keokuk, Iowa, where he served as manager of the Keokuk Electric Company. From there he went to the Houghton County Traction and the Houghton County Electric Light Company. Mr. Burke was born in Maine. He was educated at the University of Maine, where he took an electrical engineering course. He was graduated in 1906. Following his graduation he spent about two years with various companies in New York and Pennsylvania on power house and substation operation and maintenance.

Alfred S. Townsend, formerly manager of the Florida Motor Lines, Inc., and its affiliated companies and vice-president of the Florida Motor Lines, Inc., is now manager of the Northern Texas Traction Company and the Tarrant County Traction Company. He has been associated with Stone & Webster for the past 26 years and during that time has been identified with the utilities at Lowell, Mass.; Ponce, Porto Rico, and Sydney, Nova Scotia. In 1916 he was appointed manager of the properties at Beaumont and Port Arthur, included in the Eastern Texas Electric Company.

Mr. Townsend began his career in the electrical industry with the Lewiston & Auburn Electric Light Company, filling various positions with the company until he was made general superintendent in 1898, serving in that capacity for about two years. In 1925 Mr. Townsend was appointed vice-president and general manager of the operating subsidiary company of the Western United Corporation with headquarters at Aurora, Ill. These subsidiary companies had previously signed contracts with Stone & Webster for executive management service. To Mr. Townsend will fall the task of preserving the reputation of the progressive company at Fort Worth. The company a few years ago won the Coffin medal and has aspiration for that distinction again this year. Recently the management instituted a cash fare of 10 cents and a ticket fare of 40 cents a week plus 5 cents per ride. The officials believe that the new rate schedule will help not only to build volume but will really solve the fare problem for the infrequent rider, the casual rider and the wholesale rider.

Philip M. Wentworth, who will replace Alfred F. Townsend as manager of the Florida Motor Lines, Inc., and its affiliated companies, was formerly manager of the Truckee River Power Company, Reno, Nev. Later he served as manager of the Fort Madison Company in Fort Madison, Iowa, and also manager of the Dallas City, Ill., Light Company. He succeeded Walter M. Bird in 1924 as manager of the Keokuk company.

C. A. Semrad Succeeds S. B. Irelan at St. Joseph

Charles A. Semrad, vice-president and commercial manager of the Public Service Company of Colorado, Denver, has been made vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo. He succeeds S. B. Irelan, recently appointed Western manager of the securities department of Henry L. Doherty & Company.

Mr. Semrad became associated with the Boulder office of the Northern Colorado Power Company in 1912. A year previous to that he had assumed management of the Cheyenne Light, Fuel & Power Company, Cheyenne, Wyo., a subsidiary of the Northern Colorado Power Company, and later became manager of the Western Light & Power Company's properties, with headquarters at Boulder. Six years later Mr. Semrad was transferred to Denver to assume the duties of vice-president and commercial manager, which position he has held until his recent promotion. He is a graduate of the University of Wisconsin, class of 1907.

Promotions in Charlotte

A. B. Skelding, manager of the branch of the Southern Public Utilities Company at Charlotte, N. C., resigned, effective on April 1. His successor is Harry A. Orr, who has been manager of the Anderson branch since that city has been included in the Southern Public Utilities System. Coincident with the announcement of Mr. Orr's succession to the managership of the Charlotte branch, E. C. Marshall, president of the company, announced the appointment of T. F. Hill to succeed Mr. Orr at Anderson.

The former manager at Charlotte has interested himself in the formation of the Piedmont Wood Preserving Company, a new $100,000 corporation, being organized to establish a wood preserving plant near Charlotte. He will be president and treasurer of the new enterprise. At one time he organized and operated a wood preservation plant as a department of the Tidewater Power Company at Wilmington. Mr. Skelding has been manager of the Charlotte branch of the company for the past six years.

Harry A. Orr, his successor, has been engaged in utilities work since his college days. He was graduated from the Alabama Polytechnic Institute at Albany, Ala., where he specialized in electrical engineering. Following his graduation he spent two years in the engineering department of the General Electric Company at Pittsfield. When the Anderson Water, Light & Power Company was purchased by the Southern Utilities Company and became a branch of that system Mr. Orr was made manager of the Anderson branch of this company. This position he has filled since the transfer was made in 1912.

Thomas F. Hill, who succeeds Mr. Orr at Anderson, has also spent practically all of his time since his graduation from Wofford College with the utilities in Anderson. He joined the old Anderson Traction Company in 1909 and became its superintendent in 1914.

Engineering Firm Established

William H. Baker and C. G. Spencer announces the organization of the firm of Baker & Spencer, Inc., for the general practice of engineering and construction at 117 Liberty Street, New York City, N. Y.

Mr. Baker has had broad experience in investigating, financing, organizing and managing industrial businesses following an extensive engineering training. He was graduated from Cornell in 1901 and spent six years in diversified design and construction. He acted for ten years in managerial capacities for the Atlas Portland Cement Company, two years as vice-president and general manager of the Hardinge Company, three years as president of the Quigley Fuel Systems, Inc., two years as president of the Acme Cement Corporation and one year, until his resignation to organize this firm, as vice-president of the North American Cement Corporation.

Mr. Spencer, since his graduation from Cornell in 1904, has been engaged in the design, construction and operation of projects, including power plants for industrials and public utilities, railway electrification, passenger stations and repair shops, war construction, industrial plants for foundry and machine shops, leather tanning, copper wire and cable, paper making and cement manufacture during nine years with Westinghouse, Church, Kerr & Company, three years with the Toronto Power Company, two years with the Chile Exploration Company in South America, two years in the United States Army, two years with the American Sugar Refining Company and five years with McClellan & Junkersfeld, Inc., New York.

McGraw-Hill Editor Will Report Geneva Conference

In order to give American industrialists and engineers first-hand information on the deliberations and conclusions of the international Economic Conference at Geneva, the McGraw-Hill Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, is sending Edward J. Mehren, one of its vice-presidents, to the meeting. He will sail on the same ship with the American delegates and experts on April 20.

Mr. Mehren has a broad knowledge of American industry and engineering. Joining the staff of *Engineering Record* more than twenty years ago, he became in turn editor of *Engineering Record*, editor of *Engineering News-Record* and vice-president and chairman of the editorial board of the McGraw-Hill Publishing Company, Inc. In his editorial travels he has covered engineering and industrial developments in every part of the United States, in eastern Canada and in the leading countries of western Europe.

In addition to his experience gained through his editorial and publishing work, Mr. Mehren was at one time manager of the Emerson Company, thus securing an intimate insight into management technique. He was one of the organizers of the National Association of Corporation Schools and of the wartime Highway Industries Association. He has been a director of the New York Building Congress and is a director of the American Arbitration Association and chairman of the arbitration committee of the American Society of Civil Engineers.

Mr. Mehren's ability as a public speaker makes him much in demand for meetings of industrial and engineering associations and societies.

Grandville Officers Elected

At a recent directors' meeting of the newly organized United Suburban Railway, Grandville, Mich., F. F. McCarrick, Grandville, was elected president of the railroad. Other officers elected by the board were Paul E. Gezon, Wyoming Park, vice-president, and Harold T. Slaght, Grandville, secretary and treasurer.

This company is the successor to the defunct Grand Rapids, Holland & Chicago Interurban line between Grand Rapids and Jenison. Mention of this project has been made previously.

Changes in Detroit Municipal Personnel

John A. Mulqueen has resigned as supervisor of employment of the Department of Street Railways of the City of Detroit, Mich. William S. Ready, who has been in charge of the instruction of new men in the department, has been named by General Manager Del A. Smith as temporary successor to Mr. Mulqueen.

Frank J. Denny has resigned as assistant general manager and director of publicity for the Department of Street Railways. Mr. Denny, a former newspaper man, entered the railway organization about twenty months ago as assistant to Col. H. U. Wallace, former general manager.

The appointment of Fred A. Nolan, former assistant auditor, has been announced by the street railway department to fill the position of assistant general manager made vacant by Mr. Denny's resignation.

Obituary

Jilson J. Coleman

Scarcely five months since his friends honored him with the presidency of the Pennsylvania Street Railway Association, they escorted the body of Jilson J. Coleman, vice-president and general manager of the Scranton Railway, Scranton, Pa., to his final resting place in Louisville, Ky. There, beside the scenes of his early boyhood, were interred the remains of one of the oldest executives in point of service among electric railway operators in the United States.

Something of the appreciation felt for Mr. Coleman was noted in the spring of last year when he was promoted to the position of operating vice-president by A. E. Fitkin, who, under the General Engineering & Management Corporation, purchased the Scranton Railway. Mr. Coleman at that time was retained to continue his duties as general manager. During the past six months, however, since Mr. Coleman's gradual decline in health, he devoted much of his time to legislative matters of the company, leaving a great deal of the daily operation of the concern in the hands of Operating Manager Harry Dartt. When Day & Zimmermann of Philadelphia secured the controlling interest in the railway from A. E. Fitkin, Mr. Coleman received a telegram in which it was stated that no changes would be made in the operating personnel of the company.

Mr. Coleman started on his railway career in Louisville, Ky., in 1882 as a clerk for the Central Passenger Railway. He worked his way up to the position of chief clerk, and then managed the lines in New Albany, Ind. Later he moved to Cleveland and assisted Tom L. Johnson in electrifying the horse car lines there. After the work was completed Mr. Coleman helped to build the line from Allentown to South Bethlehem, and from Allentown to Catasauqua. The company at Allentown purchased the line from Allentown to Bethlehem and consolidated the two companies. Mr. Coleman was engaged in the work of rehabilitating the Yonkers systems and later started the Nassau Electric Railroad, Brooklyn, N. Y., now included in the Brooklyn-Manhattan Transit System. He managed the consolidation of the St. Louis and Washington systems for Brown Brothers, New York bankers, and built the line of the New Jersey & Pennsylvania Traction Company between Trenton and Princeton.

The late Scrantonian, who was 69 years old, was well known for his work in connection with the Shipping Board, Emergency Fleet Corporation, under A. Merritt Taylor, former transit commissioner of Philadelphia. In this capacity he saw that ample transportation was provided for the shipbuilders between Boston, Mass., and Houston, Tex.

In 1920 Mr. Coleman became general manager of the Scranton Railway. During the seven years of his régime on that property many improvements and changes have been brought about. The rolling stock has been greatly increased and more than $250,000 has been spent for the purchase of the latest type cars during the past eighteen months. Improved schedules have resulted on practically all of the carlines, and many miles of new track and roadbed have been laid.

Major S. L. Nelson

Major Samuel L. Nelson, pioneer utility magnate in the Middle West and distinguished in the World War, died on March 30 in the Pastime U. S. Veterans' hospital at Tucson, Ariz. He began his career as a waterboy with the Baltimore & Ohio Railroad and became train dispatcher, going to Illinois as a manager for the Western Union Telegraph Company. In 1886, when the late W. B. McKinley was laying the foundation of the great utility enterprises he formed, Major Nelson became associated with him, having a large part in the development of the railway and water works in Champaign, Ill. Later he was active in other McKinley utilities. He served in various executive capacities, including the presidency of several of the McKinley enterprises, and later helped to rebuild the railway at Wichita, Kan. Major Nelson went to Peoria eighteen years ago to take charge of the electric railway system and engaged in other financial and industrial activities there. At the age of 58 he enlisted at the same time as his son and served 39 months in the World War. He was 68 years old.

Rudolph Henry Peppmuller, for 21 years with the New York Rapid Transit Commission, now the Board of Transportation, died on April 4. In 1906 Mr. Peppmuller joined the staff of the Board of Rapid Transit Railroad Commissioners of New York City as an assistant architect and was assigned to design the stations for the first subway. Since then he had specialized in that branch of rapid transit construction and he drew the specifications for the contracts for the construction of the subway stations. Mr. Peppmuller was born in Staten Island 53 years ago. He studied at the Stapleton, S. I., Academy; Columbia University; Beaux Arts, Paris, and Rome.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

International Economic Conference to Meet

To determine the economic difficulties which prevent the revival of general prosperity, principally in Europe, and to acertain the best methods of overcoming these difficulties are the purposes of the International Economic Conference which will be convened at Geneva on May 4, under the general auspices of the League of Nations. Five delegates have been appointed by President Coolidge they will be accompanied by experts selected from government departments. Non-member nations as well as member nations have been asked by the league to send delegates. The acts of the delegates are not binding on their respective governments.

For more than a year a committee of 35 persons, drawn from 21 countries, has been working on the agenda and upon the data to be laid before the delegates. The topics fall under four heads. The first revolves about two main inquiries: An analysis of economic causes of the present disturbed equilibrium in commerce and industry, and a study of the economic tendencies capable of affecting the peace of the world.

Commerce questions, such as tariffs, import and export prohibitions and restrictions, monopolization and limitation of trade, dumping legislation and subsidies form the second group of studies. A particular inquiry into this group relates to the repercussion upon international commerce of reduced purchasing power.

Industrial problems come next and include study and discussion of:

1. The situation of principal industries, relating to productive capacity, output, consumption and employment.
2. Industrial, commercial and monetary causes of present difficulties of industry.
3. International industrial agreements as they affect producers, consumer and labor.
4. Production statistics.

Documents have been prepared, under the industrial classification, on coal, iron and steel, shipbuilding, the chemical industry, the electrical industry, legislation on cartels and combines, industrial management and standardization, technical and scientific progress and research, and on technical education and recruitment of technical staff.

Agriculture and its difficulties close the agenda.

In the preparation of the data for the delegates, the preparatory committee was assisted by the International Labor Office, the International Institute of Agriculture and the International Chamber of Commerce.

It is expected that topics that cannot be adequately traversed during the conference session will be referred to subcommittees for further study and report.

A characteristic of the conference is to be the breadth of its composition, the participating governments having been specifically asked to name delegates whose experience qualifies them as experts in the subjects to be discussed. In the preparatory committee, considered indicative of the composition of the conference itself, were economists, producers, merchants, financiers and representatives of labor and of consumers. The preparatory committee considers this broad representation an assurance that the conclusions will be free from the bias incident to conferences of special groups. Included in the committee were such men as Georges Theunis, Belgium; Sir Arthur Balfour, England; Ernesto Belloni, manufacturer, Milan, Italy; W. T. Layton, editor of the *Economist*, London, and Prof. Allyn Young of Harvard University.

Begin to Plan for Cleveland Now!

Diagrams of space layout for the convention of the American Electric Railway Association at Cleveland, Ohio, next October and applications for space will go out on May 16 this year instead of June 1, as has been the practice in the past.

It will be recalled that the exhibit committee voted at Cleveland on March 18 to accord all prospective exhibitors 30 days in which to file space requests. All applications received up to the close of business June 15 will receive the consideration of the exhibit committee when it meets on June 22 to make the official space assignment. Applications received after June 15 will be awarded space by the director of exhibits in the order in which they are received.

The suggestion is made that intending exhibitors plan their exhibit for the Cleveland convention now and be ready to file space requests promptly upon receipt of application blanks.

Twin City Officers in Motors Corporation

T. J. McGill of the Twin City Rapid Transit Company and H. L. Bollum of the Twin City Motor Bus Company, a subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., are members of the board of directors of the newly formed C. H. Will Motors Corporation, which will manufacture trucks and buses. To start the company has orders from two companies for 40 buses.

The Will corporation has bought the business and assets of Wilcox Trux, Inc., a long established manufacturer of motor cars, trucks and buses, lately manufacturing only trucks and buses. The Wilcox factory will be operated until May 1, when a building at 1030 Ramsey Street, Northeast, containing 50,000 sq.ft. of space, will be occupied, with option for purchase. The first year 200 men will be employed on a production plan of more than $2,000,000.

Other directors are Paul Tibbetts, G. W. Traer, Edwin White, St. Paul, and R. F. Pack of the Northern States Power Company. Officers will be: C. H. Will, president; O. S. Caesar, vice-president; J. H. Colman, secretary.

Two New Westinghouse Electric Locomotives for South Shore Line

Orders for two standard 53-ton electric locomotives were placed on April 4 with the Westinghouse Electric & Manufacturing Company by the Chicago, South Shore & South Bend Railroad. The new locomotives will be of the type known as B-1. They will cost approximately $70,000.

In order to speed up the delivery of the locomotives, the South Shore Line has sent to the Pittsburgh manufacturer a consignment of electrical apparatus suitable for 1,500-volt direct-current operation. It is understood that the Westinghouse plant has on hand two new 750-volt electric locomotives which can readily be equipped for operation on the higher voltage of the South Shore Line.

The new locomotives will be used in switching service and for miscellaneous hauling and will increase the company's freight motive power units to six. At present four 80-ton engines are being operated in regular freight service. Increased freight business, and prospects of even greater growth during the summer, is the reason for the purchase of the additional locomotives, according to Charles H. Jones, general manager.

Metal Markets Dull; Prices Lower

Domestic markets for the major non-ferrous metals were dull during the week ended April 6. Even zinc and lead, which had been moderately active in recent weeks, were very quiet. Although some sellers are asking 13.125 cents in the East for copper, this price has been shaded on small sales the last two days. On Monday the New York price for lead was cut from 7.35 cents to 7.25 cents, and the prevailing figure in St. Louis is now 7 cents. Zinc fluctuated within narrow limits during the week, but was a shade easier on April 6 than the Wednesday previous. Tin has been firm in spite of a small volume of business on the part of consumers. Buying on account of both India and China has had the effect of strengthening silver quotations, a net advance of one cent to 57¼ cents being recorded for the week. Platinum and palladium are quiet and weak, with lower prices prevailing in the outside market, although the "official" price of platinum has not been changed. In spite of the Chinese situation, antimony has weakened, owing to the lack of interest on the part of buyers.

Another week, making five weeks in all, has gone by with an exceedingly slim volume of sales in the copper market. The entire tonnage sold during the last five weeks is little more than half that which changed hands in the single record-breaking week of February. Sellers are convinced that a large volume of buying must be piling up and that when the ice is broken business will be brisk. On March 30 most sellers were asking 13¼ cents delivered, but on Friday one large producer cut its price to 13.125 cents and on April 4 most of the others joined the procession. April 5 one interest that was anxious to sell a limited tonnage cut to 13 cents in order to do business. Of two transactions on April 6 one was at 13 cents and the other at 13.05 cents.

Although buying has been exceedingly limited, prices for zinc have eased only slightly. Galvanizers are reluctant buyers and in some instances have asked that April shipments be deferred. However, it is generally agreed that smelter production will show a material decline. High grade continues dull at 8½ cents delivery in the New York district.

On April 4 the American Smelting & Refining Company again reduced its contract price for New York lead, dropping from 7.35 to 7.25 cents. The reduction followed several very quiet days in a market which has been disappointing for several weeks. In the Middle West, as in the East, the market has been dull. The leading producers booked most of their business at 7.05 to 7.075 cents, St. Louis, until the A. S. & R. reduction on April 4, since which time an even 7 cents has ruled. Resale lots have sold at 6.975 cents, but offerings of this character seem now to be pretty well cleaned up. Corroding grades of lead are quoted at $2 to $3 per ton above common.

Spot supplies of tin continue scarce, and spot Straits has lately held close to 70 cents—in fact, reaching that level on Monday. July is about 3 cents less, and April about ¾ cent under spot.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	April 5, 1927
Copper, electrolytic, cents per lb.	12.83
Copper wire, cents per lb.	15.25
Lead, cents per lb.	7.25
Zinc, cents per lb.	6.88
Tin, Straits, cents per lb.	69.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.975
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	2.25
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.90
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal.	$0.74

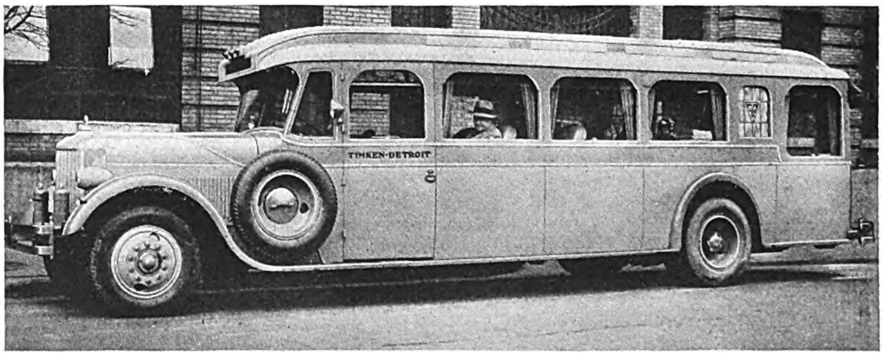
Virtues of Timken-Detroit Vehicle Brought to Possible Users' Doors

The new, specially built "Timken-Detroit" de luxe motor coach of the Timken-Detroit Axle Company is starting an itinerary that will include most of the states of the Union. It is the intention to bring to the users' doors the virtues of Timken axles and the most efficient way of caring for those in service.

The educational motor coach is complete in itself. It contains luxurious, leather-upholstered, individual chairs for twenty passengers, and in an emergency temporary seats are available for an additional twenty persons. An ice chest is provided to care for food, and large tanks are provided for drinking water. A special silver screen, which disappears into the ceiling, is provided to receive a motion picture projected from the desk in the rear of the coach. This enables an audience of forty persons, all seated comfortably in the coach, to witness the story of how Timken axles are built and serviced. In a corner of the desk at the rear of the coach a small worm-drive unit is concealed.

The interior of the coach is of natural finished mahogany. Seats are of blue leather. Protected electric fans and Pullman type ventilators are installed in the ceiling. A glass transom gives light in the daytime, and makes adequate fresh air available at all times—no matter how crowded the coach may be. The exterior is blue, trimmed in cream. Tastefully colored shades and awnings protect the passengers from the sunlight. Frosted shaded lamps make it possible to read at night without eyestrain. In fact, the coach is considered the final word in luxury possible in modern construction.

The axles are Timken, of course, and equipped with four-wheel, air-operated, metal shoe brakes providing the maximum in safety, ease of operation and brake-lining life. The powerful six-cylinder motor makes possible a speed of 60 m.p.h., although the maximum speed permitted by those in charge of the coach is 35 m.p.h., in rural districts.



New Timken-Detroit vehicle on country-wide tour

100 New Cars Likely for Detroit

Despite the defeat of the paving amendment, mentioned elsewhere in this issue, the Detroit Street Railway Commission, Detroit, Mich., will request the City Council for permission to purchase 100 new street cars to be constructed within the next year. It is estimated by Del A. Smith, general manager, that the new cars, of the Peter Witt type, can be constructed at a cost of $10,000 each or a total expenditure of $1,000,000. The original intention was to finance the new cars out of the savings of $700,000 a year which it was estimated would accrue to the system by relieving it of the paving charges.

Specifications Announced for 201 Philadelphia Buses

Announcement has been made of the details of the 201 new gas-electric buses for the Philadelphia Rural Transit Company, Philadelphia, Pa., bus operating subsidiary of the Philadelphia Rapid Transit Company, delivery of which is expected to begin about May 1. The principal specifications of the equipment follow:

Builder of chassis	Yellow Truck & Coach Manufacturing Company
Model	P.R.T. model "Z"
Builder of body	Yellow Truck & Coach Manufacturing Company
Seating capacity	Single-deck 33, double-deck 67, de luxe 27
Weight (total)	14,250 lb.
Length over all	29 ft.
Wheelbase	230 in.
Roofing material and headlining	Deck canvas and $\frac{3}{16}$-in. Haskelite
Brakes	Mechanical hand and foot
Buzzers	Electric Service Supplies Company
Destination signs	Hunter
Register	International R-10
Heaters	Exhaust pipes
Builder of engine	Yellow Truck & Coach Manufacturing Company
Bore and stroke	4¼ in. x 5½ in.
Axle bearings	Timken
Interior lighting	Electric Service Supplies Company
Ventilators	Garland
Wheels	Budd
Tires	Goodrich pneumatic, 38x7
Lubrication	Alemite
Ignition system	Northeast
Engine starter	Northeast

Rolling Stock

Evanston Railway, Evanston, Ill., has placed orders for six modern cars to cost $12,000 each. It is expected the new equipment will be put in service within the next two months, bringing the total number of cars owned to nineteen.

Macon Railway & Light Company, Macon, Ga., is planning to spend $314,000 in new equipment for its railway system following the granting by the City Council of its 10-cent fare petition. Specifications for the proposed equipment are now being drafted.

Illinois Traction System, Chicago, Ill., has announced plans for an expenditure of nearly $50,000 for new rolling stock and equipment for its "through service" between Illinois Valley points and Chicago, according to a recent announcement of F. E. Fisher, general manager. Four of the one-man cars put in use a year ago are being made over at the Ottawa shops. The new route, service over which begins on May 1, will eliminate the transfer at Joliet.

Power Houses, Shops and Buildings

Public Service Railway, Newark, N. J., will build an extension to its carhouse shop building at South Orange Avenue, Newark, for a bus garage. This garage will have a capacity of about 45 buses and will house the buses of the South Orange Avenue line.

Piedmont & Northern Railway, Charlotte, N. C., subsidiary of the Southern Power Company, has purchased from the city of Charlotte fourteen acres of land on which to build a modern passenger depot. This depot is in connection with the extension of the present electric line northward from Charlotte to Lexington, N. C., and southward from Gastonia, N. C., to Spartanburg, S. C. The price paid for the passenger station site was $46,500. The southern "missing link" between Spartanburg and Gastonia is considered one of the most important railway constructions announced in some time in this section.

International Railway, Buffalo, N. Y., has announced a comprehensive plan to attract more business to Niagara Falls and to improve facilities at the Falls View Bridge, formerly known as the Upper Steel Arch Bridge. The work intended to be carried out will cost $75,000. The present bridge structure is adequate for many years to come, although there has been congestion at the American and Canadian ends. The principal difficulty has been experienced on rush days in the American exit, where a maximum of three automobiles per lane per minute has been passed by customs and immigration inspectors. The bridge structure itself will permit the flow of twelve automobiles per lane per minute, so that by enlarging the bridge ends the company will double the capacity of the structure. Detailed plans for improvement were submitted to the group. They provide for eight exit lanes instead of two as at present. A new and more comfortable office building will be erected for customs and immigration officials with canopies over the inspection platforms. Facilities will be provided for the parking of automobiles held for detailed inspection. Tracks now used by the cars of the Niagara Great Gorge trip will be relocated, thereby facilitating the movement of automobiles.

Trade Notes

General Insulate Company, Inc., has been acquired by Insulation Manufacturing Company, Inc., Brooklyn, N. Y., and will be continued as a department of the new owners under the same corporate name. With the merger of these two plants each company will continue to specialize in Bakelite and the various kinds of molded products and insulators.

Chicago Fuse Manufacturing Company, Chicago, announces that it has purchased the Powerlet line of rigid conduit fittings formerly manufactured by the Multi Electrical Manufacturing Company. The purchasing company will continue the manufacture of its present product, Gem and Union switch boxes, outlet boxes, fuses, electrical protective materials and other wiring devices.

National Pneumatic Company on April 15 will move its New York offices to the Graybar Building, 420 Lexington Avenue, New York. The Graybar Building, located in the heart of the Grand Central business section, is adjacent to the New York Central Railroad Terminal, and by subway connection to the Pennsylvania Railroad Terminal.

Haskelite Manufacturing Corporation, Chicago, Ill., furnished its product, Plymetl, for the roofing of the new twin coach designed and built by Frank R. Fageol of Oakland, Cal. This new bus was fully described in the JOURNAL for Feb. 26.

Textile Leather Company, Newark, N. J., and the **Maumee Finishing Company, Toledo, Ohio,** have practically completed a merger which will result in the formation of the Textileather Corporation. Officers of the new corporation will be announced at an early date. Rumors announcing the closing of the Newark plant, according to a statement by the company, are entirely unfounded and the plant will continue to operate in the future as it has in the past. A new plant is nearing completion at Toledo which will supply the Western and Middle Western business and most of the automobile trade. The new corporation will be incorporated for $2,000,000 and there is no stock for sale. L. H. Green is at present acting as president of the Textileather Corporation and will continue to do so until new officers are elected.

New Advertising Literature

Ganz Electric Company, Ltd., Budapest, Hungary, is celebrating its 40 years as a manufacturer of transformers by the issuance of a handsome historical booklet that not only features the various inventors that had a part in the establishing of the company but gives an exhaustive résumé of the Ganz transformers and where they have been installed. The booklet is illustrated with sepia engravings.

Okonite-Callender Cable Company, Inc., Paterson and Passaic, N. J., is issuing a folder giving additional information for the users of Okonite tree wire.

Lincoln Electric Company, Cleveland, Ohio, has just issued its 1927 edition of the "Instruction Manual." This publication, which is revised annually to cover the latest practices used in manual electric arc welding, is of interest to practically overy one who uses arc welding. Among the subjects treated are high-speed steel welding, high-pressure pipe welding, automobile frames, boiler repairs, welding cast iron, manganese steel welding, carbon arc welding, manufacture of machinery and equipment using welded steel in place of castings.

Condit Electrical Manufacturing Corporation, Boston, Mass., is featuring its Type N-4 safety switch by a humorous folder signed by "Safety Sam."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, April 16, 1927 *Number* 16

Patching When the Material Is Too Old to Hold the Stitches

EVERY woman who does sewing knows well enough that it is a waste of time to put on a patch unless the material is strong enough to hold the stitches. Similarly, every electric railway manager should know that it is futile to build up a piece of special trackwork by welding when there is not enough rail left to hold the new metal. Unfortunately, however, that is just what some companies are doing.

To take a specific case, a railway in an Eastern city has spent much good money patching up a right-angle double-track crossing that was worn out long ago. Welding has been done on this special trackwork on an average of once in two months for years past. The crossing is so old, however, that the repairs never last long.

Every time repairs are undertaken it is necessary to transport the welding apparatus to the job, open up the pavement, weld, grind, close the pavement and take the apparatus away again. A crew of seven men has usually been employed on this job—a foreman, two traffic flagmen, a welder and his helper, and two laborers to take up and restore the pavement and operate the rail grinder. Always the work has been much hampered by traffic and has taken many hours for completion. In its effort to maintain the old crossing, this company is spending considerably more every year for labor alone than the interest and depreciation charges on a piece of new special trackwork.

Truly in this case it may be said that the railway is paying for new material without getting it.

Repair Defective Cars Before They Break Down

MECHANICAL men agree that higher standards of maintenance will improve performance. Many examples where records are kept carefully have shown that when once the equipment has reached a state of excellent repair, costs of the work are reduced considerably. The expense of putting the equipment in the condition desired, however, has proved a serious obstacle on many railways. At the present time most electric railway men are more alert to the need of high-class overhauling than ever before. Increased study is being given to maintenance problems and many railways are adopting higher standards with closer fits for wearing parts.

In the class of inspection work to prevent failure much can be accomplished, not only in reducing ultimate maintenance costs but also in improving public relations through preventing failures in service where the public will see them. Defective parts should be renewed before they cause difficulties and equipment should be kept as nearly as practicable in its original condition. This requires a carefully arranged organization with work so laid out that it will not be done hurriedly and the workmen will have ample time to make sure that all parts are inspected and repaired where necessary.

The great tendency where men are hurried and overworked is for them to slight parts which will continue to operate without producing an immediate failure. Frequently complete breakdown will result before the car is due for its next regular inspection and then costs mount rapidly, for the damaged parts often cannot be repaired but must be replaced.

Those responsible for maintenance of electric cars will do well to collect all the data possible regarding costs which result from repairing equipment after it fails, and present these to general managers in as convincing fashion as possible. Such arguments as this are needed in order to put across any campaign for higher standards of repair work and improvements in car equipment so as to give the best service from the car rider's standpoint.

Home-Made Tools Are Often Crude and Expensive

ONLY one field remains that is not flooded with tools for every inconveniently located bolt or screw. That is the railway industry. In fact, the tool manufacturers have scarcely entered it. In the past each master mechanic made most of his own tools when he had a special application where a standard tool would not accomplish the desired results. This habit of making his own tools is expensive, for it requires a great deal of his time for supervision which should be spent in studying ways and means of improving maintenance conditions. When the home-made tool is completed it will have cost more in man-hours to make it, which will be charged to the maintenance account, than would a corresponding factory-made tool. Home-made tools are generally very crude. When questioned as to why the tool was made the usual answer is, "We needed it and did not know where to buy it."

Since electric railway equipment is standard, if one master mechanic needs a special tool for a special application it is almost certain that some other master mechanic would be glad to get the same tool if he knew such a tool was in existence. The tool manufacturers have a group of engineers who are trained in the design and application of special tools. These staffs of engineers are available to assist in solving the tool problem in the railway field if they are consulted. Often it

This is the issue in April that is devoted essentially to maintenance and construction subjects

may only be necessary to make a slight change in some existing tool to fit the special purpose. Even though it may be necessary to design and make the tool from the ground up, the manufacturer can do it cheaper than it can be made in a railway shop. If the manufacturer can be convinced that a special tool developed for one railway can be sold at a profit to a number of others the cost of development may be absorbed by him.

By consulting tool manufacturers for all special tools two important things will be accomplished: First, the "Jack of all trades" is kept from wasting a lot of valuable time and material making some unnecessary tool just because he would rather do that than work at some productive job, and, secondly, if a tool manufacturer develops all special tools every railway operator can avail himself of these tools.

In the Annual Maintenance Number and in this issue of ELECTRIC RAILWAY JOURNAL a section is devoted to "Improved Equipment for Electric Railway Maintenance." Literature from these manufacturers should be obtained by maintenance foremen and kept on file for ready reference.

The Public Likes Soft Seats

WHERE, oh, where, is the man named Legion who argued that seats of slats or formed wood were so durable, so sanitary and so cheap to buy and maintain? Why provide shock absorbers in the seats, when kindly Nature had provided them in the passengers' anatomy?

Oddly enough, these arguments were so unconvincing to the pushful automotive fellows that not one of them put out an automobile with springless seats. To them "seat" was synonymous with "cushion." The purveyor of the cheapest cars incased his springs with near-leather; while the maker of cars "of the better kind" went to limp leather and over-stuffed cushions for the open cars and plush or velours for the closed ones. The very air itself was made to serve as down.

These improvements followed naturally, since the seat user was primarily the buyer of the vehicle, whereas in railway transportation the seat-user's choice was controlled by others. Now that almost everybody has enjoyed the experience of riding on air, the public utility carrier on rails is following in the wake of the personal carrier on rubber.

Desirable and even vital to ride selling as this use of softer seats may be, two factors must not be overlooked that make a direct, complete imitation of personal car standards unnecessary: First, a good car running over a good rail does not have as much jounce and bounce as the automobile. The simplest proof of this is the greater ease of reading. Second, a public transportation vehicle, especially in city service, cannot afford as much area per passenger as a personal car.

So it appears that eminently satisfactory seats can be provided for trolley cars without too wide a departure from the shapes and over-all dimensions of standard cross-seats. It is to be expected that over-stuffed or air cushions and extra-padded backs may increase seat centers to the point where 44 seats of the old type allow room for only 40 seats of the new. This is perhaps as large a concession as can sensibly be made.

It hardly seems necessary to go to the extent of installing individual bucket seats or otherwise striving to secure the effect of a Pullman chair car. Such arrangements are excellent for long-ride, interurban service, or for de luxe service, but are likely to prove rather confusing for the most expeditious handling of short-ride, city passengers during the "standing" hours. Recent visits to cities with soft-seat cars leads to the conclusion that the public is well pleased with standard cross-seats in the modern cushionings and is not likely to insist that its bread should be buttered on both sides.

Perfection of Detail Differentiates the Artist from the Dabster

FOREMOST among the qualities which have distinguished the great artists of all periods has been meticulous attention to detail. The painter does not execute his central figure with great care and then fill in the background in a hit-or-miss fashion. Perhaps it is a far cry from the painter with his palette to the painter of electric railway rolling stock, but the latter might profit by following some of the principles by which the former is guided.

Frequently the effect of a really creditable car design is marred by the intrusion of a few inharmonious elements. Take, for example, a car interior where the seats have been upholstered in leather, the floor has been covered with linoleum and the woodwork finished like fine furniture. After taking these steps to make the car comfortable and attractive, it is a pity to cover nearly all the available flat surfaces with the railway's prohibitions and warnings. Yet this often is done. A single de luxe car has been placarded with these several notices:

No smoking.
Spitting is unlawful.
Watch your step.
Do not talk to the operator.
Passengers are allowed to ride on front platform.

Variations of these themes, as well as many other ones, can be found in countless cars. At best the effectiveness of such stereotyped notices is extremely doubtful. Every one knows that smoking and spitting are forbidden, yet a certain number of passengers persist in doing these things despite the signs. Riding on the platform and talking to the operator are matters that can be controlled without plastering notices on the bulkheads. If the railway management really wants to attract the motorist by furnishing transportation approximating the private automobile in comfort, he should avoid covering the inside of his vehicle with notices and warnings that detract from its appearance and irritate the passenger.

Temporary Repairs Are a Source of Danger

SOMETIMES, due to a shortage in the working force or to an abnormal number of crippled cars, temporary repairs are made in order to allow the car to re-enter service immediately. The intention in some cases is to bring the car into the shop the following day and make permanent repairs. However, in many cases the following day's work schedule is filled completely and the car is allowed to continue in service.

The necessity for making permanent repairs promptly cannot be over-emphasized. Experience has proved that delayed repairs are uneconomical. They make the ultimate repairs more expensive, both in actual cost and in the length of time that the equipment must be withheld from service in order to make them. Frequently breakdowns that result on the road cause delays and inconvenience to passengers. In order to foster a good feeling with the public, delays in service must be kept to a minimum. This can be done by immediate care of repairs and frequent inspection which should cover all details thoroughly, even to small and seemingly unimportant parts.

Principles and Methods of Rate Regulation

JUST about the time that the decision was announced in the St. Louis & O'Fallon Railroad case there appeared the April issue of the *Yale Review*, with an article "Principles and Methods of Rate Regulation," by Arthur T. Hadley. This article, like the decision, has been widely quoted. Dr. Hadley's presentation is a brief but learned discussion of the matter. He goes back to the earliest times and says that for more than 2,000 years there has been a conflict between traders and philosophers as to the basis of value. His idea is that a reasonable rate is one that can be justified on grounds of public policy. It must not be so high as to place an unfair burden on the people who require the service, nor so low as to inflict an unfair disability on the people that render it.

To the leading electrical men in the United States Mr. Hadley pays a tribute by saying they have known how to avoid some of the difficulties into which the railroads have fallen. They have grasped the principle that the interests of the public service corporation are closely identified with those of the public which it serves, and they have done a great deal to make the people grasp it. They have taken the authorities into their confidence. They have consulted them in advance as to matters of financial policy. They have not been content with avoiding legal action; they have tried to avoid grounds of suspicion. The consequence is that public service commissions have generally been friendly to the electrical industry, and as a secondary consequence there has been more rapid and more varied development of electric service in this country than anywhere else, and the public has obtained its current at comparatively cheap rates. This is a nice compliment. On the whole, it is well deserved.

Where freedom is abused the abuse can be prohibitive, but a few abuses should not be made a reason for abolishing freedom. Seven principles are cited by Mr. Hadley as having been proved by experience but ignored by governments at their peril. He holds to the opinion that the use of cost of plant, and especially original or historical costs, as a rate base is wrong in principle and often dangerous in practice. He says that the true basis for judging whether rates are reasonable is comparison with those of other companies working under similar conditions. If the rate is low in comparison with what prevails elsewhere, and has developed traffic to an unusual degree, profits from that traffic have been well earned.

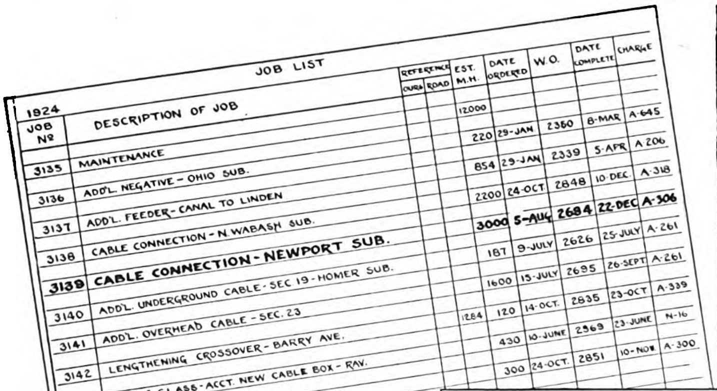
An important need, as he sees it, is to give public service commissions an opportunity to study the history of past attempts at regulation and the economic principles which have determined their success and failure, and to encourage them in such study. It is his idea that they should not be so overwhelmed with specific cases and complaints as to have no time for dealing with general questions of economic policy. They should be regarded and should regard themselves as expert advisers of the courts, the legislatures and the public on matters of vital importance to the country's future. His doctrine certainly is sound that the question of rate regulation must be considered from both ends—producers' and consumers'. And the conclusion is inescapable that it is quite as important for all parties to secure a supply equal to the demand at any given price or rate as it is to have that rate fixed as low as possible. There will be general agreement, particularly among utility men, with the observation of Mr. Hadley that politicians find it easier to concur in a widespread popular error than to decide for themselves what will prove best in the long run. It certainly takes a good deal of firmness and a good deal of economic and historical knowledge on the part of a commission or a court to protect the interests of the future against the loud-voiced demands of the present.

Massachusetts Companies Work in Concert

LESS attention in railway circles than it deserves appears to have been received by the operating agreement entered into recently by the New England Transportation Company, bus operating subsidiary of the New York, New Haven & Hartford Railroad, and the Eastern Massachusetts Street Railway. Under the terms of the arrangement between the companies the electric railway will receive from the bus company 18 cents for each passenger transported between East Walpole and Boston and Boston and East Walpole on the run from Attleboro to Boston.

The route covered by the buses encroaches upon territory served by the electric railway. The sole issue before the Massachusetts Department of Public Utilities in the case was whether public convenience and necessity required the operation of motor vehicles over the proposed route. The commission thought that it did. It ruled on this point, and this point alone. It volunteered the opinion that "however unjustifiable and unwarranted the payment to a street railway of a portion of the fare received by the transportation company may be, it does not affect the question which presents itself on this petition." And that question, as previously indicated, was one of public convenience and necessity.

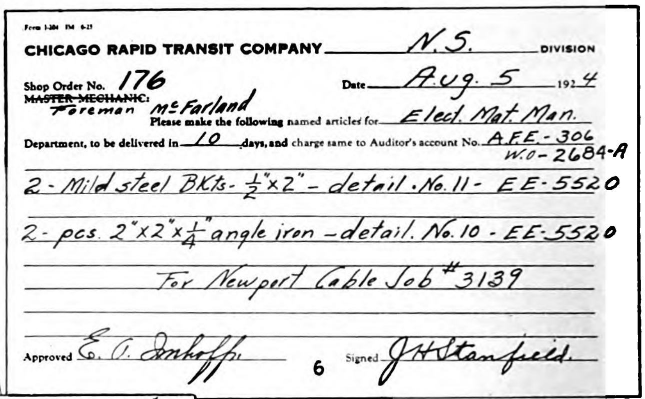
The participation issue appeared to be clear cut. The transportation companies apparently found it not only expedient but mutually advantageous to enter into the agreement they did. All the points are not plain to the outside commentator, but it is not difficult to see that the disposition the companies made of the matter was advantageous to the public. Competition in the territory, if it received state sanction, which is unlikely, is unthinkable and not in the best interests of the public or the company. On the other hand, one of the companies involved was in a position better than the other to give the service, and it seems only sensible that the utilities of their own volition should conclude between them an arrangement satisfactory to each other. Certainly the end achieved seems on its face to be much more salutary than other so-called solutions resorted to in the past. If some such arrangement as this could have been amicably worked out in another Eastern state, to mention just one instance, recourse would not have been necessary there to the courts with all that such action implies of a struggle to the bitter end. It would not do to say that any compromise is better than such a contest, but it does appear in the Massachusetts case that compromise was much better than contest.



JOB LIST

1924 Job No	Description of Job	Reference Ours	Reference Road	Est. M.H.	Date Ordered	W.O.	Date Complete	Charge
3135	MAINTENANCE			12000				
3136	ADD'L. NEGATIVE – OHIO SUB.			220	29-JAN	2360	8-MAR	A-645
3137	ADD'L. FEEDER – CANAL TO LINDEN			854	29-JAN	2339	5-APR	A-206
3138	CABLE CONNECTION – N. WABASH SUB.			2200	24-OCT	2848	10-DEC	A-318
3139	**CABLE CONNECTION – NEWPORT SUB.**			**3000**	**5-AUG**	**2684**	**22-DEC**	**A-306**
3140	ADD'L. UNDERGROUND CABLE – SEC 19 – HOMER SUB.			187	9-JULY	2626	25-JULY	A-261
3141	ADD'L. OVERHEAD CABLE – SEC. 23			1600	15-JULY	2695	26-SEPT	A-261
3142	LENGTHENING CROSSOVER – BARRY AVE.		1284	120	14-OCT.	2835	23-OCT	A-339
3143	PINS & GLASS – ACCT. NEW CABLE BOX – RAV.			430	10-JUNE	2569	23-JUNE	N-16
3144	REMOVE CABLE, STA. 11 TO ALTGELD ST.			300	24-OCT.	2851	10-NOV.	A-300

2



Form 1-204 5M 6-23

CHICAGO RAPID TRANSIT COMPANY N.S. DIVISION

Shop Order No. 176 Date Aug. 5 1924

~~MASTER MECHANIC~~: Foreman McFarland

Please make the following named articles for Elect. Mat. Man.

Department, to be delivered in 10 days, and charge same to Auditor's account No. A.F.E.-306 W.O.-2684-A

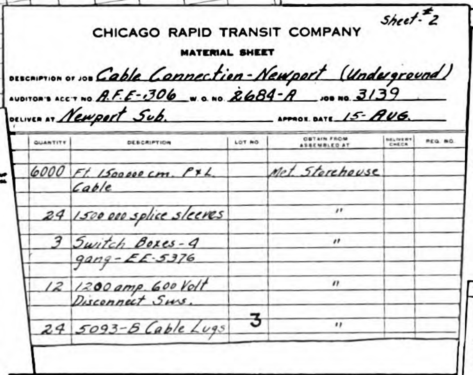
2 - Mild steel BKts - $\frac{1}{2}$"x2" - detail. No. 11 - EE-5520

2 - pcs. 2"x2"x$\frac{1}{4}$" angle iron - detail. No. 10 - EE-5520

For Newport Cable Job #3139

Approved E. O. Imhoff Signed J H Stanfield.

6



Sheet #2

CHICAGO RAPID TRANSIT COMPANY

MATERIAL SHEET

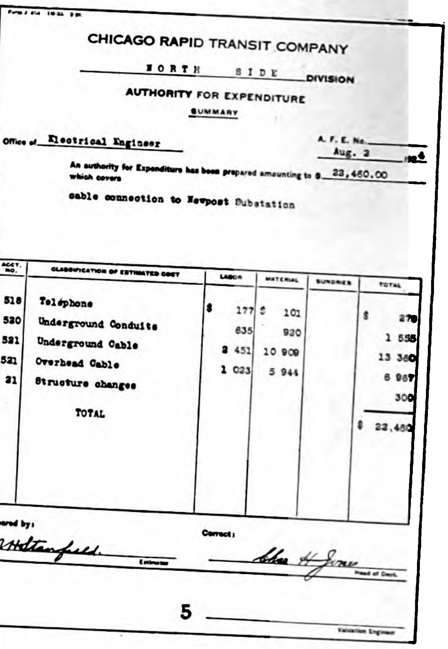
DESCRIPTION OF JOB Cable Connection - Newport (Underground)

AUDITOR'S ACC'T NO. A.F.E.-306 W. O. NO. 2684-A JOB NO. 3139

DELIVER AT Newport Sub. APPROX. DATE 15-AUG.

Quantity	Description	Lot No.	Obtain from Assembled at	Delivery Check	Req. No.
6000	Ft. 1500000 cm. P+L. Cable		Met. Storehouse		
24	1500000 splice sleeves		"		
3	Switch Boxes - 4 gang - EE-5376		"		
12	1200 amp. 600 Volt Disconnect Sws.		"		
24	5093-B Cable Lugs		"		

3



CHICAGO RAPID TRANSIT COMPANY

NORTH SIDE DIVISION

AUTHORITY FOR EXPENDITURE

SUMMARY

Office of Electrical Engineer A. F. E. No. ____

Aug. 2 1924

An authority for Expenditure has been prepared amounting to $ 22,460.00 which covers

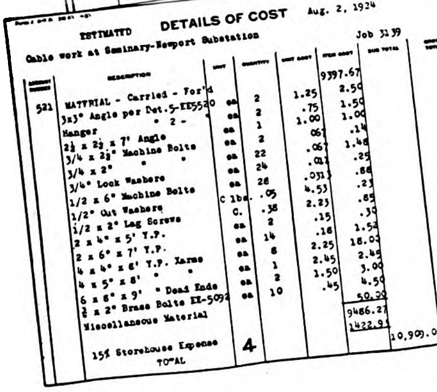
cable connection to Newport Substation

Acct. No.	Classification of Estimated Cost	Labor	Material	Sundries	Total
518	Telephone	$ 177	$ 101		$ 278
520	Underground Conduits	635	920		1 555
521	Underground Cable	2 451	10 909		13 360
521	Overhead Cable	1 023	5 944		6 967
21	Structure changes				300
	TOTAL				$ 22,460

Prepared by: J H Stanfield. Estimator

Correct: Chas H Jones Head of Dept.

5 ____ Valuation Engineer



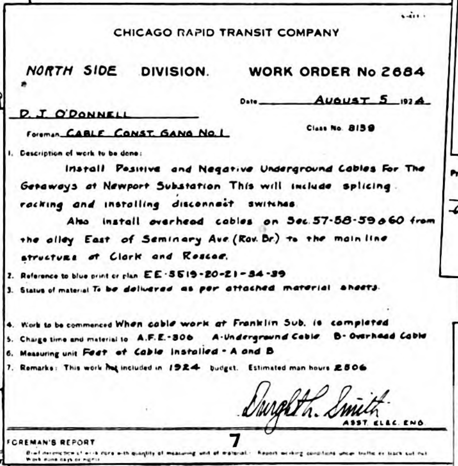
ESTIMATED DETAILS OF COST Aug. 2, 1924

Cable work at Seminary-Newport Substation Job 3139

Account Number	Description	Unit	Quantity	Unit Cost	Item Cost	Sub Total	Group Total
521	MATERIAL - Carried - For'd				9397.67		
	3x3" Angle per Det.5-EE5520	ea	2	1.25	2.50		
	" " " 2 - " Hanger	ea	2	.75	1.50		
	2½ x 2½ x 7' Angle	ea	1	1.00	1.00		
	3/4 x 2½" Machine Bolts	ea	2	.067	.14		
	3/4 x 2" " "	ea	22	.067	1.48		
	3/4" Lock Washers	ea	24	.011	.25		
	1/2 x 6" Machine Bolts	ea	28	.0313	.88		
	1/2" Cut Washers	C lbs.	.05	4.53	.23		
	1/2 x 2" Lag Screws	C.	.38	2.23	.85		
	2 x 4" x 5' Y.P.	ea	2	.15	.30		
	2 x 6" x 7' Y.P.	ea	14	.18	1.52		
	4 x 4" x 8' Y.P. Xarms	ea	8	2.25	18.00		
	4 x 5" x 8' " "	ea	1	2.45	2.45		
	6 x 8" x 9' " Dead Ends	ea	2	1.50	3.00		
	3/8 x 2" Brass Bolts EE-5092	ea	10	.45	4.50		
	Miscellaneous Material				50.00		
						9486.27	
	15% Storehouse Expense					1422.94	
	TOTAL						10,909.00

4

A few of the forms used for following up and recording progress of work



CHICAGO RAPID TRANSIT COMPANY

NORTH SIDE DIVISION. WORK ORDER No 2684

Date AUGUST 5 1924

D. J. O'DONNELL

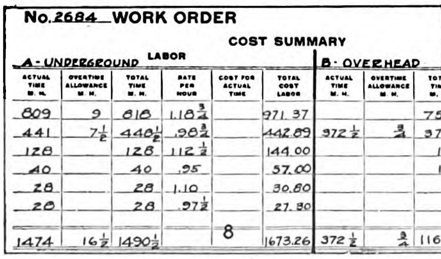
Foreman CABLE CONST. GANG No. 1 Class No. 8139

1. Description of work to be done: Install Positive and Negative Underground Cables For The Getaways at Newport Substation This will include splicing racking and installing disconnect switches. Also install overhead cables on Sec. 57-58-59 & 60 from the alley East of Seminary Ave (Rav. Br.) to the main line structure at Clark and Roscoe.
2. Reference to blue print or plan EE-5519-20-21-34-39
3. Status of material To be delivered as per attached material sheets.
4. Work to be commenced When cable work at Franklin Sub. is completed
5. Charge time and material to A.F.E.-306 A-Underground Cable B-Overhead Cable
6. Measuring unit Feet of Cable Installed - A and B
7. Remarks: This work ~~not~~ included in 1924 budget. Estimated man hours 2506

Dwight L. Smith ASST. ELEC. ENG.

FOREMAN'S REPORT

7



No. 2684 WORK ORDER

COST SUMMARY

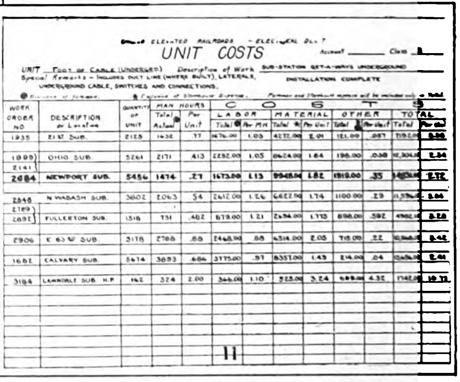
LABOR

A - Underground Actual Time M.H.	Overtime Allowance M.H.	Total Time M.H.	Rate per Hour	Cost for Actual Time	Total Cost Labor	B - Overhead Actual Time M.H.	Overtime Allowance M.H.	Total Time M.H.
809	9	818	1.18¾		971.37			759
441	7½	448½	.98¾		442.89	372½	¾	373
128		128	1.12½		144.00			17
40		40	.95		57.00			17
28		28	1.10		30.80			
28		28	.97½		27.30			
1474	16½	1490½			1673.26	372½	¾	1166

8

Fig. 2—Sheet from job list for cable work, which is Class 3.

Fig. 3—The material sheet shows the quantity of each item needed to do the work.



ELEVATED RAILROADS - ELECTRICAL DEPT.

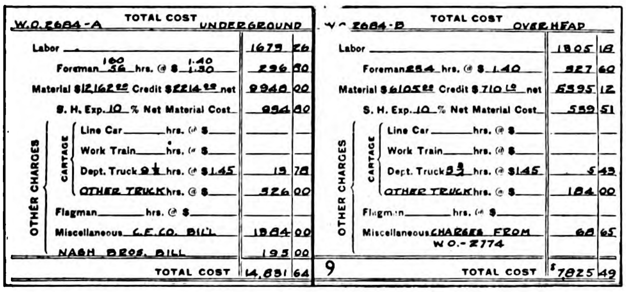
UNIT COSTS Account ____ Class 3

UNIT Foot of Cable (Underground) Description of Work SUB-STATION GET-A-WAYS UNDERGROUND INSTALLATION COMPLETE

Special Remarks – Includes duct line (where built), laterals, underground cable, switches and connections.

Work Order No.	Description or Location	Quantity of Unit	Man Hours Total Actual	Man Hours Per Unit	Labor Total	Labor Per M.H.	Material Total	Material Per Unit	Other Total	Other Per Unit	Total Total	Total Per Unit
1935	21st Sub.	2125	1632	.77	1676.00	1.03	4272.00	2.01	121.00	.057	[illegible]	[illegible]
1999 2141	Ohio Sub.	5261	2171	.413	2282.00	1.05	8624.00	1.64	198.00	.038	[illegible]	2.34
2684	**Newport Sub.**	**5456**	**1474**	**.27**	**1673.00**	**1.13**	**9948.00**	**1.82**	**1919.00**	**.35**	[illegible]	**2.72**
2848	N. Wabash Sub.	3802	2063	.54	2612.00	1.26	6622.00	1.74	1100.00	.29	[illegible]	3.04
2789 2892	Fullerton Sub.	1518	731	.482	879.00	1.21	2694.00	1.775	898.00	.592	[illegible]	3.28
2906	E. 63 St. Sub.	3178	2788	.88	2468.00	.88	4514.00	2.05	718.00	.22	[illegible]	3.42
1682	Calvary Sub.	5674	3893	.686	3775.00	.97	8357.00	1.45	214.00	.04	[illegible]	2.41
3184	Lawndale Sub. H.P.	162	324	2.00	366.00	1.10	525.00	3.24	[illegible]	4.32	[illegible]	[illegible]

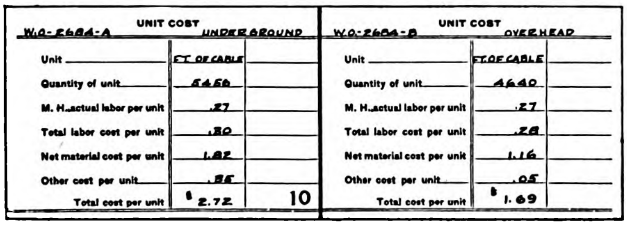
11



W.O. 2684-A TOTAL COST UNDERGROUND		
Labor	1673	26
Foreman ~~56~~ 160 hrs. @ $ ~~1.30~~ 1.40	296	80
Material $12162.00 Credit $2214.00 net	9948	00
S. H. Exp. 10 % Net Material Cost	994	80
Other Charges – Cartage – Line Car ____ hrs. @ $ ____		
Work Train ____ hrs. @ $ ____		
Dept. Truck 9½ hrs. @ $1.45	13	78
Other Truck hrs. @ $ ____	526	00
Flagman ____ hrs. @ $ ____		
Miscellaneous G.E. Co. Bill	1084	00
Nash Bros. Bill	195	00
TOTAL COST	14,651	64

W.O. 2684-B TOTAL COST OVERHEAD		
Labor	1805	18
Foreman 234 hrs. @ $ 1.40	327	60
Material $6105.00 Credit $710.00 net	5395	12
S. H. Exp. 10 % Net Material Cost	539	51
Other Charges – Cartage – Line Car ____ hrs. @ $ ____		
Work Train ____ hrs. @ $ ____		
Dept. Truck 3¾ hrs. @ $1.45	5	43
Other Truck hrs. @ $ ____	184	00
Flagman ____ hrs. @ $ ____		
Miscellaneous Charges from W.O.-2774	68	65
TOTAL COST	$7825	49

9



W.O.-2684-A UNIT COST UNDERGROUND		
Unit	Ft. of Cable	
Quantity of unit	5456	
M. H. actual labor per unit	.27	
Total labor cost per unit	.30	
Net material cost per unit	1.82	
Other cost per unit	.56	
Total cost per unit	$2.72	

10

W.O.-2684-B UNIT COST OVERHEAD		
Unit	Ft. of Cable	
Quantity of unit	4640	
M. H. actual labor per unit	.27	
Total labor cost per unit	.28	
Net material cost per unit	1.16	
Other cost per unit	.05	
Total cost per unit	$1.69	

Fig. 4—Form of sheet used to work out details of estimated cost.

Fig. 5—The authority for expenditure gives a summary of labor and material items.

Fig. 6—Items to be made in the department shop are requisitioned on a shop order.

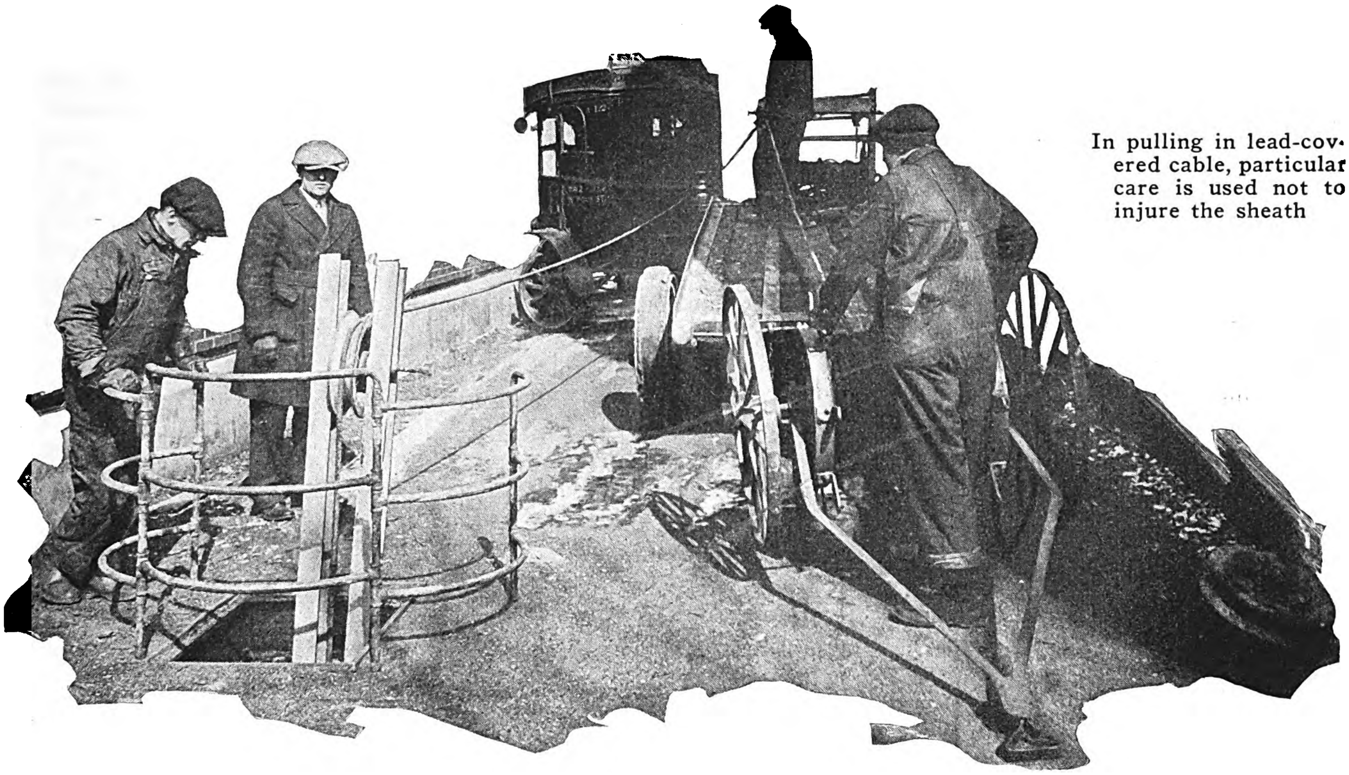
Fig. 7—The work order is the actual authority for beginning construction work.

Fig. 8—Summary of cost is given on completed work order sheet.

Fig. 9—The total cost sheet gives much valuable information.

Fig. 10—Unit costs are figured and entered on a separate sheet.

Fig. 11—The condensed record of unit costs makes comparison easy with other similar jobs.



In pulling in lead-covered cable, particular care is used not to injure the sheath

Careful Organization of Force Stimulates Effort

By Dwight L. Smith

Electrical Engineer Chicago Rapid Transit Company, Chicago, Ill.

To complete work speedily and make sure that finished jobs will be done in a manner to minimize service interruptions the electrical department must be organized thoroughly and be provided with many labor-saving tools

WORK in the electrical department of the Chicago Rapid Transit Company includes the operation, construction and maintenance of all electrical equipment except for rolling stock, signals and interlocking. It includes third rail, cables both underground and overhead, telephones, lights, bells, overhead trolley, pole lines, track bonding, storage batteries and such substations as are owned by the company. Maintenance of the system requires about 50 men, and work which can be classed properly as construction requires about 50 more.

This organization includes a centralized control, a definite and logical routing for all work, and specialists for each step in this routing. No step is begun before each preceding one is completed and checked, so that the personnel responsible for each step can proceed with full assurance that everything previous is in readiness, and entire attention can be devoted to doing each part with the utmost efficiency and dispatch.

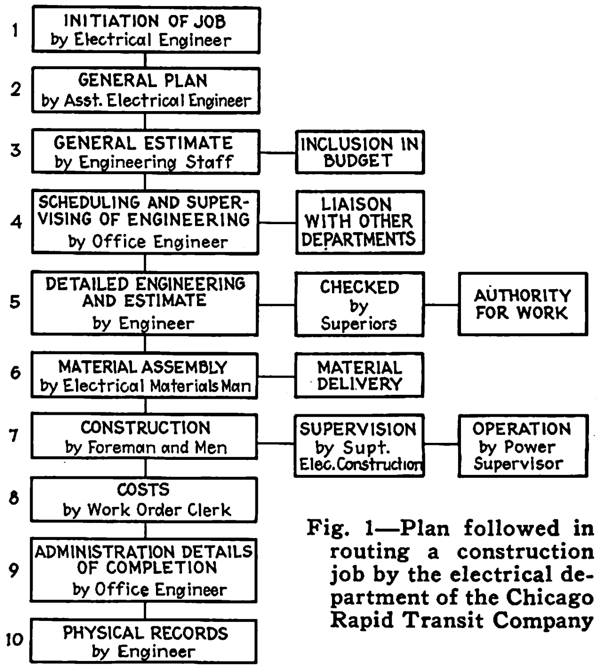

1
INITIATION OF JOB by Electrical Engineer
2
GENERAL PLAN by Asst. Electrical Engineer
3
GENERAL ESTIMATE by Engineering Staff
INCLUSION IN BUDGET
4
SCHEDULING AND SUPERVISING OF ENGINEERING by Office Engineer
LIAISON WITH OTHER DEPARTMENTS
5
DETAILED ENGINEERING AND ESTIMATE by Engineer
CHECKED by Superiors
AUTHORITY FOR WORK
6
MATERIAL ASSEMBLY by Electrical Materials Man
MATERIAL DELIVERY
7
CONSTRUCTION by Foreman and Men
SUPERVISION by Supt. Elec. Construction
OPERATION by Power Supervisor
8
COSTS by Work Order Clerk
9
ADMINISTRATION DETAILS OF COMPLETION by Office Engineer
10
PHYSICAL RECORDS by Engineer

Fig. 1—Plan followed in routing a construction job by the electrical department of the Chicago Rapid Transit Company

The general plan of routing construction work is shown on Fig. 1, Construction Job Routing. As a large engineering staff is employed, the construction organization does not even hear of a job until the engineering is completed, the work laid out for it in the smallest detail, all materials on hand and ready for delivery to the job, necessary permits obtained, and accompanying work by other departments arranged for; in fact, until there is nothing for the construction forces to look after but to do the physical work as planned. Frequently the actual construction work is the smallest part of the job. As an illustration of the methods employed, a job recently completed of making the cable connection to a new substation will be referred to in detail.

Most items of work initiate within the department, although certain items become necessary because of work of other departments. The greater part of a year's work is decided by inclusion in the budget at the beginning of a calendar year. As soon as the budget is approved all such known items are listed on a job list, Fig. 2. Such a list is made for each class of work, cable work being Class 3, and each individual job is given a number the first digit of which indicates its class. This job number is the office reference, and in a file identified by this number all information on the job is kept together.

The job list provides: (1) A ready record of the jobs which must be completed during the year; (2) a quick reference of the estimated time required for each job, and (3) a running record as to the status of each job, i.e., whether it is still untouched, under construction or completed.

At the commencement of each year the job list is first used to make a survey of labor and material requirements. The man-hour figures are based on unit man-hour costs for past work of a similar nature. The estimates as included on the job list are of course rough, for no details of the coming jobs are yet known, but are sufficiently close to make estimates of the total amount of labor for each class. These totals indicate the number of men required to complete all work in the year's program. This property has found that for the average cable job a gang of six men and a foreman is the most efficient and the total man-hours thus indicates the number of gangs necessary.

The job list is a continuous one. It is not closed until the end of the year and then any unfinished work is transferred to the next year's list. When work unforeseen at the beginning of the year develops it is entered, given a number and placed at the bottom of the list. There is always a certain amount of this additional work and so any estimate for man strength must make the necessary allowance.

Material requirements are also estimated at the beginning of each year, considering the items of major material on similar jobs in the past. It is not possible to estimate exactly all minor material, but this is a small part of the total. Estimating the major items gives the purchasing department an opportunity to buy on favorable markets and to order in ample time to have the material on hand when needed. Deliveries are specified throughout the year in accordance with the work program, sufficient leeway being allowed to make sure of receipt but allowing delivery at the same rate as that of use, thus keeping the storekeeper's amount of stock as low as possible.

The number of construction gangs having been determined, a job schedule is next made for each of them, showing the order in which each job will be started, and, from the man-hour estimate and the number of men at work, the actual date for starting. The order in which the jobs are scheduled is, in general, determined by the degree of necessity. In making the schedule the correlated work of other departments must be considered, and they are consulted and necessary compromises made to suit best all those concerned. The job schedule also gives information as to the progress of the work and references to allied work, status of authority. layout and material.

Jobs are assigned to the engineering staff for layout in the same order that they appear on the job schedule and from one to six months in advance of the time set for commencing the construction. Up to the time of assignment only the most general information on them is known, as a few preliminary sketches, correspondence and the general plan dictated by the department head. This information has been kept together carefully in the job file and is turned over and explained to the engineer.

In almost all jobs there are several ways of accomplishing the same result, but it is part of the engineer's work to determine the best and most efficient way. However, to assist the engineer as well as the construction forces, types of construction and kinds of material adopted as standards are used whenever possible. These are got up in standard circulars and standard prints. Each foreman is provided with a loose-leaf binder containing a complete set, so that when the engineer decides to make use of a certain standard he has only to indicate on his layout its number and the foreman will know exactly what is wanted.

The duties of the engineer are: (1) To make detailed drawings of the installation; (2) to make a detailed list of the kind and quantity of every item of material necessary for the job; (3) to make a detailed estimate of cost, and (4) when the job is completed to make or revise the permanent records.

For the substation connection job referred to, the engineer's first work was to determine the number and size of cables required. An annual survey made under heavy winter load conditions gives ampere loads and voltage conditions on each feeder section of the Chicago Rapid Transit system. This becomes a permanent record in the power supervisor's office and reference to it indicates the cable capacity necessary.

A field survey showed an underground duct line as the best method of carrying the cables from the substation to the right-of-way. With this determined, locations for manholes, grouping of cables in ducts and in laterals, location of laterals and disconnect switches were decided. On this job, second-hand lead-covered cable was to be used and the engineer had to check his required cable lengths carefully and tabulate them against lengths on hand to insure the minimum wastage.

While a part of each construction job can be covered by standards, many items cannot, and it is the duty of the engineer to lay these out in detail and provide the proper material. For instance, in the job illustrated, while the switch boxes are standard, the method of mounting is not, and necessary iron brackets had to be designed to fit the location.

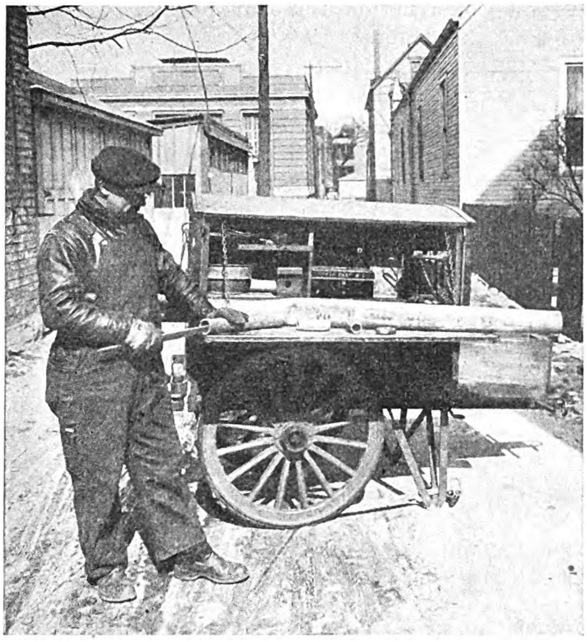
A small shop is operated by the department, to build small special items of this sort; standard items and large quantities of special items can be bought from commercial sources more cheaply than they can be made outside of the organization.

The layout completed, showing in detail what was proposed and where and how it was to be done, and every method and material used plainly indicated, the next step for the engineer is the preparation of the material sheet illustrated in Fig. 3, showing the quantity of each item, both special and standard, needed to do the work. This must cover everything necessary, even to bolts, nuts and washers, so as to prevent any delay to the construction forces from lack of proper and sufficient material.

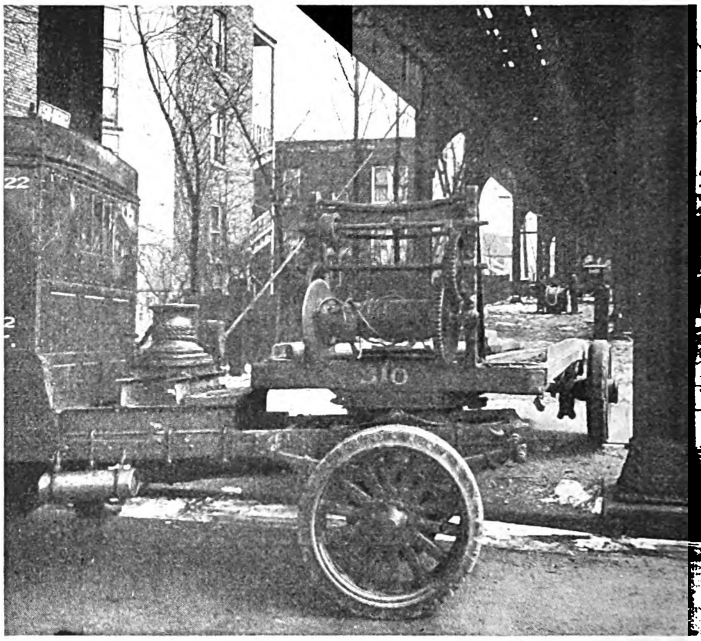
Special authority must be obtained for each construction job and the cost estimate for this authority is a part of the engineer's work. These are shown in Figs. 4 and 5. The material sheet needs only to be priced from material costs on record in a card system in the office, or obtained through the purchasing department for special material. Labor cost estimates are made by reference to previous unit costs, carefully checked by comparing the work into component parts and by making independent estimates of each part. Adding the proper per cents for stores expense, engineering and contingencies a total cost is obtained. The care used in making these is such that most job costs come within a few per cent of the estimates. All planning and estimates made are then checked carefully and approved by the department head and authority for the work is requested.

The proper authority obtained, material sheets are gone over and compared with blanket orders, material not already on order is requisitioned, and items to be made in the department shop are requested by a shop order as shown in Fig. 6. Appropriate notes are made on the material sheet. Work to be done by contractors or other departments is arranged for. The material sheets are sent to the electrical materials man. Follow-up checks are made from week to week to insure

Above—Shop operated by the electrical department to build small special items
Below—Special brackets used for mounting are made in the blacksmith shop



The splicer's cart is a handy piece of equipment brought to the job



In pulling overhead cables with a winch truck, it is necessary to anchor the cable reel

that all material will be in readiness when the schedule starting date arrives.

An interesting and necessary link in this department's organization is the electrical materials man, a stores department employee who devotes his entire time to handling material used by the electrical department and whose function is to furnish the necessary material delivered at the job, when and where needed. His duties include both the physical handling of this material and the clerical work necessary to account for it, as well as supervising the transportation necessary for its delivery.

The material sheet is received weeks, even months, before a job is scheduled to start. A reasonable length of time in advance he commences to gather together the material for a job. The smaller items are assembled in a material container, a box equipped with a standard lock to which each foreman has a key, and larger items are assembled in a bin, each of them as well as the containers being tagged with the job description and number. This assembly is simple, as all electrical material is kept in one storehouse, and its storing in steel cases with unit piling, each item identified by a lot number, makes it easy to find and count quantities. The items made in the department's own shop are also picked up and assembled with the balance of the material.

If repeated checks, as the commencement of the job approaches, show that certain items may not be received in time, it may be necessary to send after and pick up this material from local stocks on emergency orders, or to substitute obtainable items.

The material sheet shows the approximate date the material for each job is to be delivered, and the materials man plans to have it ready a few days in advance. In every case, however, the foreman advises by telephone the exact date when it is wanted and it is delivered only on receipt of this advice.

A truck has been found the cheapest and most efficient means of delivering practically all materials, and this company finds that one 1½-ton truck, intelligently handled, can ordinarily keep the entire force supplied with material. This requires consolidation of deliveries to different gangs working in the same area, and elimination of waste time. The truck is loaded in the late afternoon and is started out the next morning in time to arrive at the job when the construction force commences work. Even the smallest items of material are delivered by truck, the workmen being forbidden to come into the storehouse for any reason.

In delivering material, the truck driver takes with him two copies of the material sheet, one of which is signed by the receiving foreman, who retains the second copy of his list.

After each large order for material has been filled, or at intervals of one month or less, the stock of all items of standard material is checked against an indicated minimum quantity and orders are placed for all those which have fallen below the minimum. All the steps detailed herein have been taken before the construction force has even heard of the job. This force consists of a varying number of gangs, each in charge of a foreman, who reports directly to the electrical superintendent.

About a week before each job is scheduled to start the necessary information for the foreman is assembled. A numbered work order, illustrated in Fig. 7, is the actual authority for the construction. It refers to the job number, gives a brief description of the work, refers to the blueprint numbers of the details, indicates the auditor's charge number for the work, shows the measuring unit to be used by the foreman in making his report, and also shows the estimated man-hours for doing the job.

Six copies are made of the work order, one for each of the job foremen, electrical superintendent, electrical materials man, cost clerk, power supervisor and superintendent of maintenance of way, the latter to keep in touch with the department most interested in co-ordinating work with the electrical department.

Accompanying the foreman's copy of the work order are blueprints of all drawings pertaining to the job and copies of all material sheets. Since construction gangs have no headquarters other than on the job, correspondence with them is by U. S. mail to the foreman's homes, and they use the same means to send their time slips and reports to the office.

Within the next few days the foreman takes several hours away from his current job and goes to the location of the next one to study it there and plan his procedure. On that visit the superintendent accompanies him and explains and settles any details not clear.

Arriving on the site of the new job with men, tools and material, the foreman is at once ready to commence work. The material must be checked and compared with the lists. No matter how carefully work has been laid out and material computed, as the work progresses different or additional material becomes necessary. This is obtained by a telephone order from the foreman to the materials man and is likewise delivered by truck within 24 hours. Changes in plans may become necessary, in which case the engineer goes out to the job and approves them before they proceed.

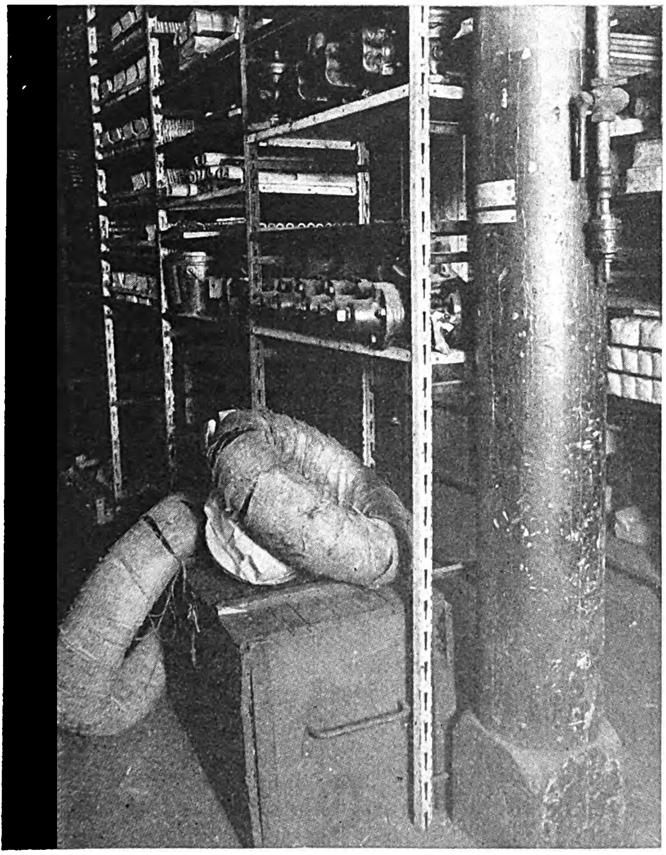
In the substation connection job used as an illustration more than 10,000 ft. of underground and overhead cable were to be installed, in sizes of 1,500,000 and 2,000,000 circ.-mil. Cable is pulled in with a power winch truck, which is ordered by the materials man when wanted. The special tools required for this work, such as cable grips, manhole guards, I-beam cable sheaves and steel pull line are sent out by the materials man from the tool storage room.

The splicing of the underground lead-covered cable is done by the cable splicer and helper, who are summoned by the construction gang foreman when he is ready. Splicing tools and equipment are contained in the cable splicer's cart which is brought to the job. When the splicing, training and racking are completed all cables are protected by wrapping with ¼-in. hemp rope over which a sand and cement mixture is plastered, a protection sufficient to confine the damage of a burn-out to the one cable in which it originates. All cables are identified by tagging in each manhole, at the disconnect switches and in the substation with aluminum tags on which is stamped the individual cable number, such as "71 C," the "71" being the feeder section number and the letter the reference to the particular cable on that section.

The foreman is responsible for the performance of his gang. In the job illustrated the duct line ran under an alley. While cable pulling was in progress the foreman learned that paving of the alley would start within two days. Since this would have blocked his pulling completely, it was necessary to work fourteen hours a day for two days to get out of the way, and although this increased the cost by overtime work, the result was better than being completely blocked from work for a time.

In cutting over cables and making them alive, the power supervisor is consulted on each move, as he is the man directly responsible for the operation of the power system. The construction work completed, it is inspected by the superintendent, who then approves the work order. The foreman makes notes of the date of completion and the quantity of the measuring unit of material used, and returns the work order to the office. All surplus material and scrap are returned to the storehouse for credit and the gang moves on to its next job.

The duty of the cost clerk is to keep detailed costs of each job and so summarize them when work is completed that he can tell instantly how much the job costs in man-hours or money, total or per unit. This work also furnishes an accurate record of dates, material,



Small items are placed in a box and locked—all are tagged carefully

All electrical material is kept in a storehouse with steel shelves arranged for unit piling special charges and credits. In fact, it becomes the highly condensed record of that job. The unit costs are further tabulated by groups for reference in estimating future jobs of like nature.

The cost system is a simple method of bookkeeping. An account sheet is opened for each work order. On this are entered the labor items as listed in the "Labor Distribution" sheet kept by the timekeeper, material charges, cartage charges, special charges and credits.

The job completed and the foreman's copy of the work order returned is the cue to the cost clerk to close up that account, price out his items, total and summarize them. These summaries are shown in Figs. 8, 9 and 10. The measuring unit shown on the work order is the appropriate one of a number of standard units each of which has a page in the condensed record of unit costs, and on this page, shown in Fig. 11, are entered the unit costs of this job for comparison against all jobs of a similar nature.

There remain to complete the job the making or revision of records by the engineer who handled it and the administrative details of completion such as notification to the auditor, general storekeeper and valuation engineer.

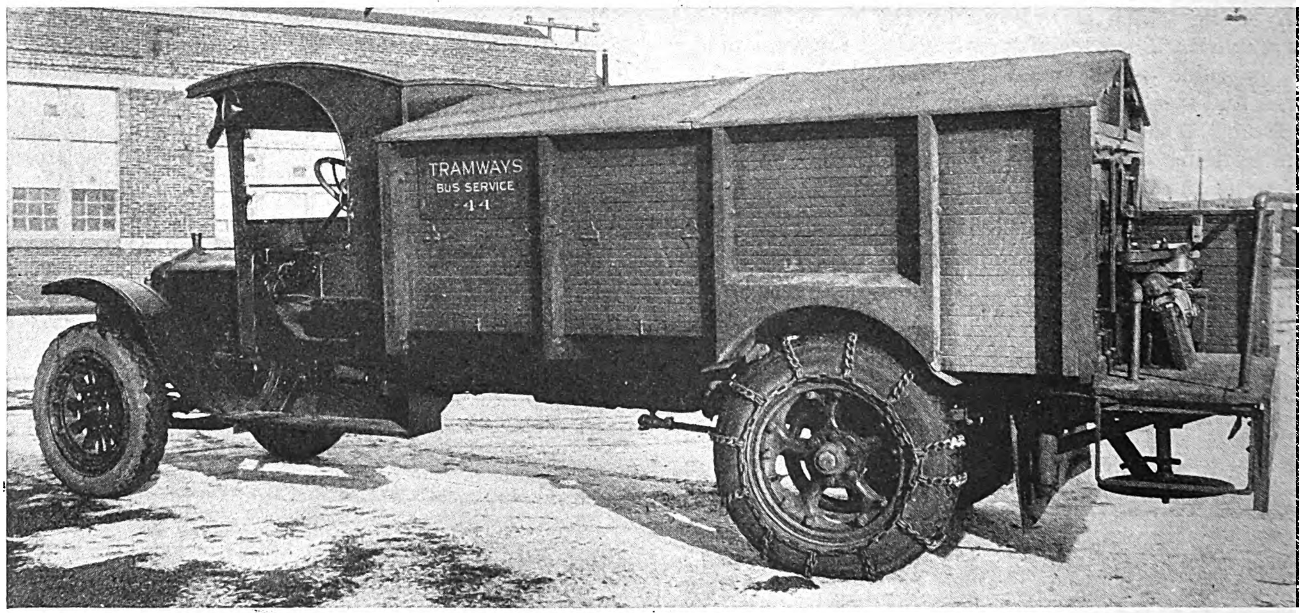
The entire scheme is nothing but an application of specialization, one man or a group of men to do each step in the work, and the whole so co-ordinated that each confines his work to his specialized portion. The advantages which result from this method of organization are several: Each job is given individual attention and occupies a very definite place in the year's program; all details of each job are settled before work is commenced; all work of similar character is done in a similar manner according to standards which have been found best; the gang foreman is provided with full instructions so there is no chance for guesswork by him; working efficiency is very high because the foreman and his men can devote their entire time to the actual construction, unhampered by the necessity to provide material, run errands or tend to other details. As a result all jobs move along faster, more jobs are handled during the year and the efficiency of the department is raised to a point that is hard to excel.

Truck Sands Bus Routes

By A. M. Lindsay
Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

Many heavy grades which must be negotiated in Montreal make it necessary during the winter months, with an abundance of ice and snow, to take every precaution available for safety. The slippery conditions make it necessary to sand bus routes not only on the grades themselves but frequently, under very icy conditions, over the greater part of their length. To carry out this work quickly and economically, the Montreal Tramways built the sand truck illustrated.

The equipment for this sand truck came from discarded parts of bus equipment. An overhauled chassis was taken, and an engine and sand hopper were added. The sand hopper will hold 2½ tons of sand when filled. Under the forward part of this hopper there is room for two compartments, which are used for tools, shovels, etc. The interior sides of the hopper have a slope of 1 in 3 toward the rear end of the truck, which has the distributing valve. The inside is sheet metal.



Sand-spreading truck as used on bus routes by the Montreal Tramways

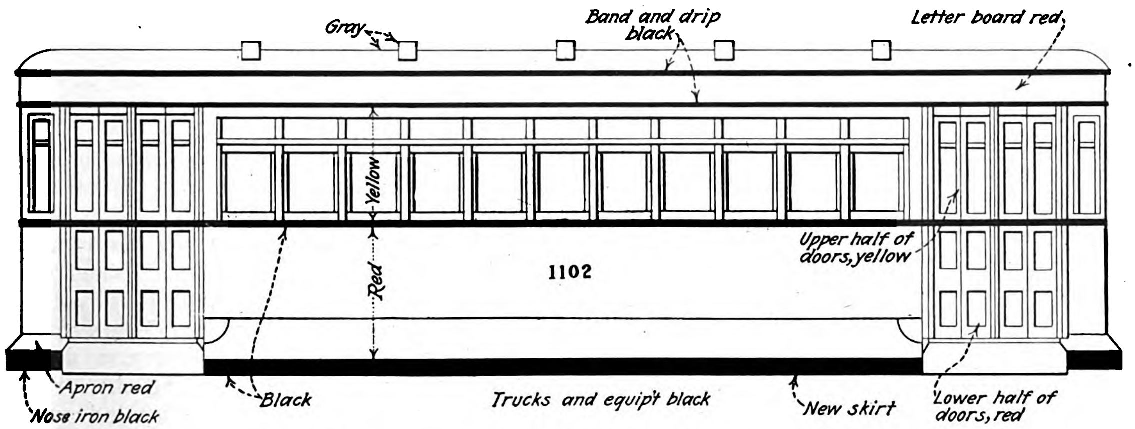
Sand is spread by a saw-steel disk which rotates in a horizontal plane at the end of an extension shaft. This shaft is inclosed completely and runs on ball bearings which are mounted in a steel pipe. An Evinrude Super-Elto outboard marine motor operates the sand-spreading mechanism. Sand or ashes is delivered from the controlling slide valve through a flexible hose to the spreading disk. The top of the disk is provided with eight small hardened steel radial ribs ¼ in. high. These have been found sufficient to give the distribution required.

The width of the road surface which is to be covered can be altered by adjusting the speed of the engine, the height of the radial ribs and the point of delivery on the disk of the sand supply. Cooling water for the Elto engine is drawn from the truck engine radiator and has been found to assist the circulation in the latter. To dampen the exhaust of the spreading engine a large muffler is provided, and to steady the engine under the unusually light load it is made to drive a rotary oil pump against a fixed pressure in the closed return pipe.

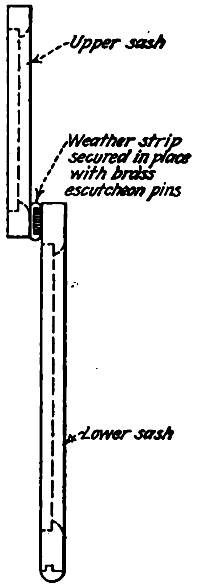
Remodeling, Repainting and Overhauling Methods in Kansas City

By R. S. Neal
Superintendent of Equipment Kansas City Public Service Company
Kansas City, Mo.

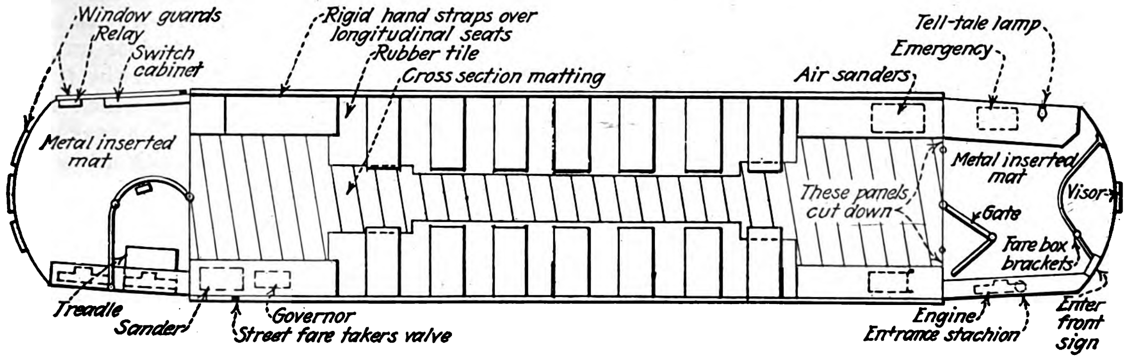
Rattan seats covered, rubber tiling laid over floor, skirts added to car body, visor over front vestibule center window, new paint scheme applied, weather stripping added to windows, complete overhauling for trucks


Gray
Band and drip black
Letter board red
Yellow
Red
1102
Upper half of doors, yellow
Apron red
Nose iron black
Black
Trucks and equip't black
New skirt
Lower half of doors, red

Color arrangement used for painting the cars


Upper sash
Weather strip secured in place with brass escutcheon pins
Lower sash

Weather stripping is installed between the upper and lower sash


Window guards
Relay
Switch cabinet
Rigid hand straps over longitudinal seats
Rubber tile
Cross section matting
Tell-tale lamp
Emergency
Air sanders
Metal inserted mat
These panels cut down
Metal inserted mat
Gate
Visor
Fare box brackets
Treadle
Sander
Governor
Street fare takers valve
Engine
Entrance stachion
Enter front sign

Floor plan showing arrangement of composition flooring

EXTENSIVE remodeling and overhauling of equipment is now being carried out in the shops of the Kansas City Public Service Company. The program includes work on 45 cars. Folding doors are being installed at the front and treadle-operated doors at the rear. Safety air equipment is combined with the electrically operated rear doors. Seats which were previously covered with rattan are being overhauled and maroon Kemi-suede is placed over the rattan. Window latches, lifts and other car fittings are being nickel plated. A floor covering of rubber tiling is being laid and a metal wear-proof flexible matting added in the body of the car. In the vestibule a metal-rubber floor will be installed. Special skirts, Celotex lined, are being attached to the base of the car body to improve the appearance and decrease noises from motors and trucks. Lamp shades of a special type are being used in connection with car lighting changes. A swinging gate and a special metal visor are to be installed on the front vestibule. Cars will be painted inside and out, using a new paint scheme.

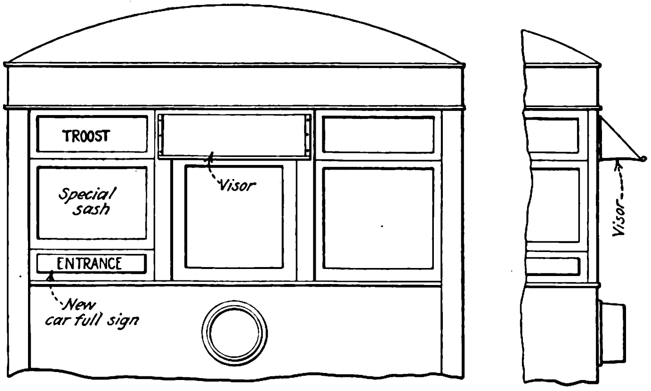
The work is being done on a twelve-car-a-week schedule, so that two cars are completed each day. The program for the work includes the placing of the cars in position in the erecting shop for overhauling. Trucks are removed and sent to the truck floor for general overhauling. Special attention is given to gears, bearings, gear cases and other parts so as to eliminate noise. Springs and side and center bearings are being checked up so as to maintain a standard step height.

In connection with the body overhauling the lower right-hand front vestibule sash are removed and used for replacement and a special sash is installed in this position in conjunction with a Hunter "Enter-Front" sign. Other sash are removed from the car, stenciled and then sent to the glazing bench in the mill. After repairs have been made they are sent to the paint room for cleaning and repainting. The sash are reinstalled in the car during the final trimming by the erecting department. Body curtains are removed and sent to the curtain bench for thorough cleaning and repairing. From there they go to the paint shop to be installed when cars are trimmed. Old type khaki motorman's curtains are removed and replaced by new pantasote curtains.

To reduce noise and also to provide greater warmth in the cars weather stripping is placed between the sash, as indicated in an accompanying illustration. All cars are being equipped with Faraday push buttons, and for this installation the pilasters are sent to the mill for reboring. Car roofs are inspected carefully, as it is found that about 25 per cent require recovering.

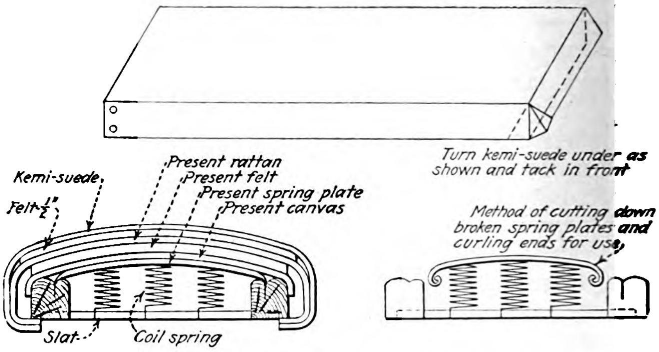
The practice of the railway is to use monel metal for heater resistors. Where this wire has already been installed in the heaters they are left on the seat frames, but if they are not so equipped they are removed and sent to the electric shop for this change. Seat frames are removed and the backs and cushions stripped from them. Frames are marked with position and car number and sent to the paint shop for painting, after which they are ready to be installed in the car when it is trimmed. Seat backs are sent to the erecting department and cushions are thoroughly dusted and cleaned. Spring plates on the longitudinal seats require considerable care, as many of them are broken. An accompanying sketch shows the method of reworking these plates. Cattle-hair felt ½ in. thick is installed over the rattan and over this a covering of maroon Kemi-suede is placed.

All car trim items such as sash locks, lifts, seat back corner castings, light sockets, etc., are removed, tagged with the car number and sent to the electric shop, where they are nickel plated, buffed and lacquered. Seat back corner castings are returned to the upholstering bench, where they are installed in the backs as they are upholstered. Other parts are sent to the paint shop. Body stanchions are removed and sent to the pipe bench to be cut to size for front-entrance use. Controllers are removed and pipes, valves, etc., installed for the use of new safety air equipment. The safety air adapters are installed on the heads of the controllers when these are overhauled.



At the front end of the car a special window is installed for use with signs and a visor is placed over the front center window

Motorman's and conductor's railings are removed and sent to the pipe department for necessary repairs. Fare box brackets are added to the large post on the front railing. Also, when stripping the vestibule floor, the individual seat at the right-hand corner of the car is removed. Floor strips in the walkway, in the center of the car body floor, are removed and level floor laid in their place. This requires resurfacing of the trapdoors. If the floor under the seats is very rough, uneven or weak it is replaced. All floor is placed in shape to make a good surface on which the composition flooring can be laid. An accompanying floor plan shows the arrangement.

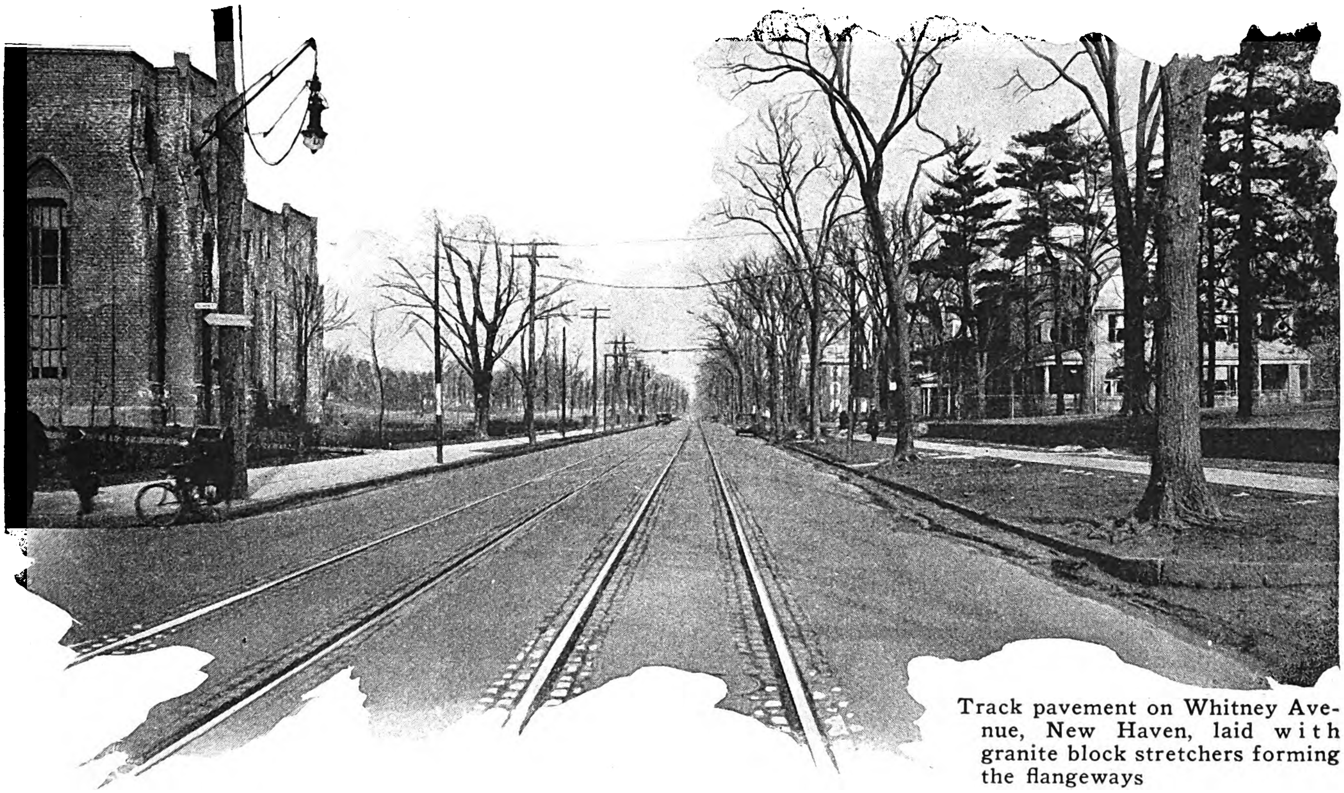

Kemi-suede
Felt ½"
Present rattan
Present felt
Present spring plate
Present canvas
Slat
Coil spring
Turn kemi-suede under as shown and tack in front
Method of cutting down broken spring plates and curling ends for use

Method used for upholstering seats and cutting down broken spring plates

The front door, door posts and operating mechanism are removed and all except the doors scrapped. The front door header is removed and sent to the mill for clearance cuts for the upper door shaft arms. This header is reinstalled in its original position. Four new doors equipped with safety rubber buffers are fitted. Front doors are operated by one door engine located on a steel base plate mounted in cabinets over the front door. Rear doors and shafts are removed from the cars and shafts are stripped from the doors and sent to the welding and machine shops for lengthening. Doors are sent to the mill for repairs and reworking. A door engine cabinet, practically the same as that used over the front doors, is installed over the rear doors, in which two door engines are mounted on base plates. The rear exit step is equipped to operate in connection with a treadle device which is installed in the vestibule floor just inside of the exit doors. The rear doors are electrically controlled and air operated.

After the overhauling work is completed the car is placed over a pit in the rear of the paint shop and the composition flooring is laid. At the same time body skirts are installed. They are made of No. 16 gage steel lined with Celotex and hinged to the car bodies. These skirts improve the appearance and decrease truck and motor noises. The metal visor which is installed over the center vestibule window is made of No. 20 black iron and is installed when the cars are trimmed.

Cars remain six days in the paint shop. The first day they are washed inside and out, scraped and sanded. The second day they are primed and puttied on the outside and the ceiling and hoods painted on the inside. The third day they are sanded and touched up on the outside and the first coat of enamel for the inside and outside is put on. The fourth day the second coat of enamel is applied both inside and outside. The fifth day the outside is blocked up for numbers and striped. The inside is touched up and switches and numbers are put on. The next day the car is trimmed for service. An accompanying diagram shows the painting scheme used.



Track pavement on Whitney Avenue, New Haven, laid with granite block stretchers forming the flangeways

Extensive Annual Track Reconstruction Done by Connecticut Company

Way maintenance is co-ordinated with municipal paving program. T-rail is standard. Flangeways are formed by granite blocks set in rich concrete. Pavement between rails has extremely low crown

By M. M. Johnston

Division Engineer Connecticut Company, New Haven

BELIEVING that careful maintenance of the permanent way is an essential of good electric railway service, the Connecticut Company has adopted a policy of extensive annual track reconstruction. During the past six years 133 miles of track has been rebuilt, a yearly average of slightly more than 22 miles. Last year 21.33 miles of city track and 9.73 miles of interurban track were reconstructed, or slightly more than 31 miles in all. This was the largest amount done in any one year of the company's history. The total mileage reconstructed by the Connecticut Company in 1926 was second only to that of the Chicago Surface Lines, the largest urban electric railway in the world.

MILEAGE OF TRACK REBUILT BY THE CONNECTICUT COMPANY, BY YEARS

Year	City	Interurban	Total
1921	12.81	5.02	17.83
1922	27.73	2.91	30.64
1923	17.89	2.19	20.08
1924	14.59	5.04	19.63
1925	11.17	2.83	14.00
1926	21.33	9.73	31.06
Total	105.52	27.72	133.24
Average	17.59	4.62	22.21

The track rebuilt by the Connecticut Company has varied somewhat from year to year, as shown in the accompanying table.

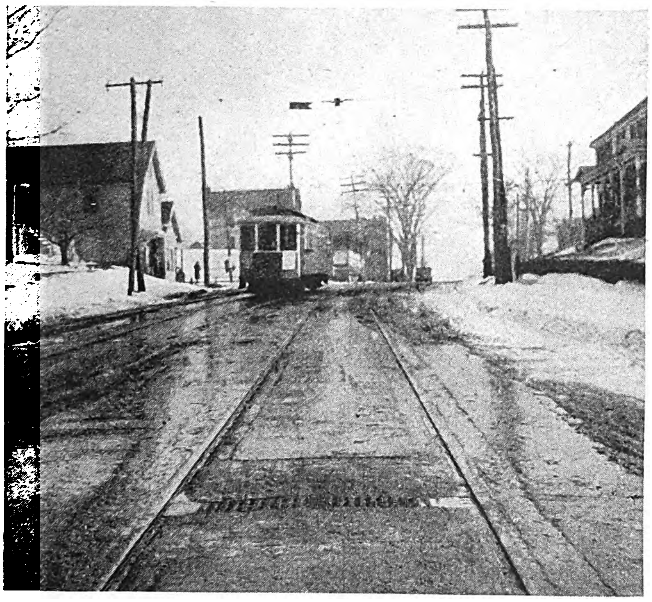
Under the laws of Connecticut an electric railway is required to pave only 8 in. on each side of the rail. However, if trackwork is done separately from general paving, the entire cost of removing and relaying the pavement in the track area must be borne by the railway. Where there is double track, this sometimes means paying for a strip of pavement 19 ft. in width. For this reason the Connecticut Company makes every effort to co-ordinate its track reconstruction with the paving programs of the various municipalities through which its lines run.

When a paving project is proposed the railway investigates the age and condition of its track in the street and decides whether or not it will last the life of the

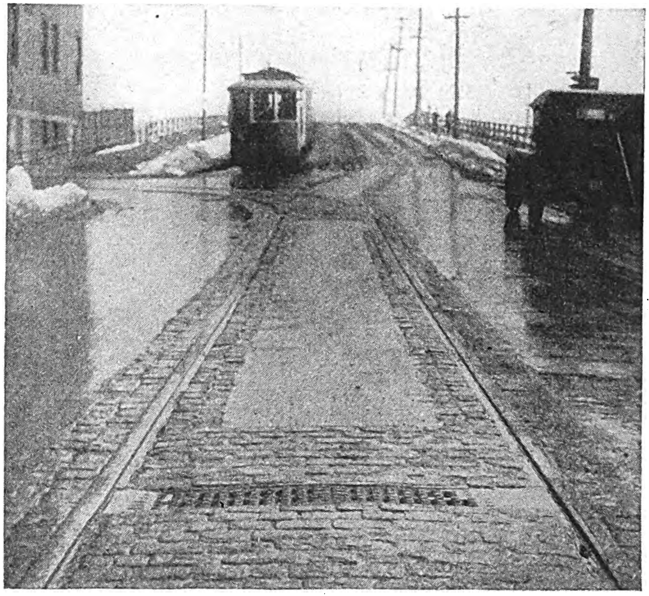
the area of wheel contact on the rail are used with new rail. A feature of these plates is the staggered notching of the spike holes. An article on this subject was published in ELECTRIC RAILWAY JOURNAL April 5, 1924, page 537.

Rail used on the city divisions is standard 6-in., 100-lb. A.R.A. section except in the Hartford division, where grooved girder rail is used on account of franchise provisions. Both thermit and seam welded joints are used. The cost is approximately the same, about $6.50 per joint. Base plates are used with seam welded joints, as told in the article already referred to. Thermit welded joints are unsupported. In paved track no expansion joints are provided except at special work.

Pavement used with the standard city construction is of five types: (a) Asphalt with granite stretchers on each side of the rail, (b) asphalt with a concrete strip on each side of the rail, (c) solid asphalt laid up to the rail, (d) solid concrete laid up to the rail, (e) solid granite block laid up to the rail. Because of the narrowness of the strip the cost does not vary greatly except in the cost of the granite block construction that averages about $2.35 per foot of single track, this cost representing four strips 8 in. in width. An article dealing with certain features of this construction was published in the ELECTRIC RAILWAY JOURNAL Jan. 31, 1925, on page 194.



Asphalt paving with 8-in. concrete strip on each side of rail. Flangeway is made by means of template shown on preceding page



Granite blocks are used for pavement 3 ft. each side of track drains regardless of how remainder of street is paved

When granite blocks are used to form a flangeway, as in structures (a) and (e) of the preceding paragraph, they are set in a dry mixture consisting of one part cement and two parts sand. The blocks are thoroughly rammed home. Between the block and the gage side of the rail a 1-2-3 mixture of concrete using very fine stone is placed. This mixture is thoroughly rammed between the block and the web of the rail and is plastered with a wet mixture consisting of one part sand and two parts of cement. Finally the whole strip is sprayed with water from a hose, which sets up the sand and cement cushion under the blocks and prepares them for grouting.

Sometimes the granite blocks are grouted all the way to the top, and at other times only half way up, depending on the amount of vehicular traffic using the street. Unless this is extremely severe, the grouting is carried only half way and the remaining space is filled in with pitch and gravel. From the railway viewpoint this method is considered preferable as it tends to seal up the track structure better and maintains the bond between rail and pavement.

When asphalt or concrete is used without granite block stretchers the flangeway is made by shaping this material. It is tamped under a special curved template shown in an accompanying sketch. This work is done in 12-ft. sections. A considerable amount of pavement has been laid in this manner and has given satisfactory service.

Only a ½-in. crown is given to the pavement between rails. Drainage depends largely on the longitudinal grade. At low points, and elsewhere as needed, track drains are installed. These are of cast iron shaped to fit the flat crown. Approaches to these drains are paved with granite block for 3 ft. on each side regardless of the general street paving.

During three years experience no trouble has been encountered with dirt or ice in these flangeways. Automobiles trying to turn out of tracks do not slew or skid. There is less wear on the pavement on account of less impact caused by vehicles crossing the tracks at right angles. There is also less wear because the flangeway is too narrow to permit wheels to drop down between rails. The low crown design has proved popular with the public in general because it has made the pavement smoother in the track area.

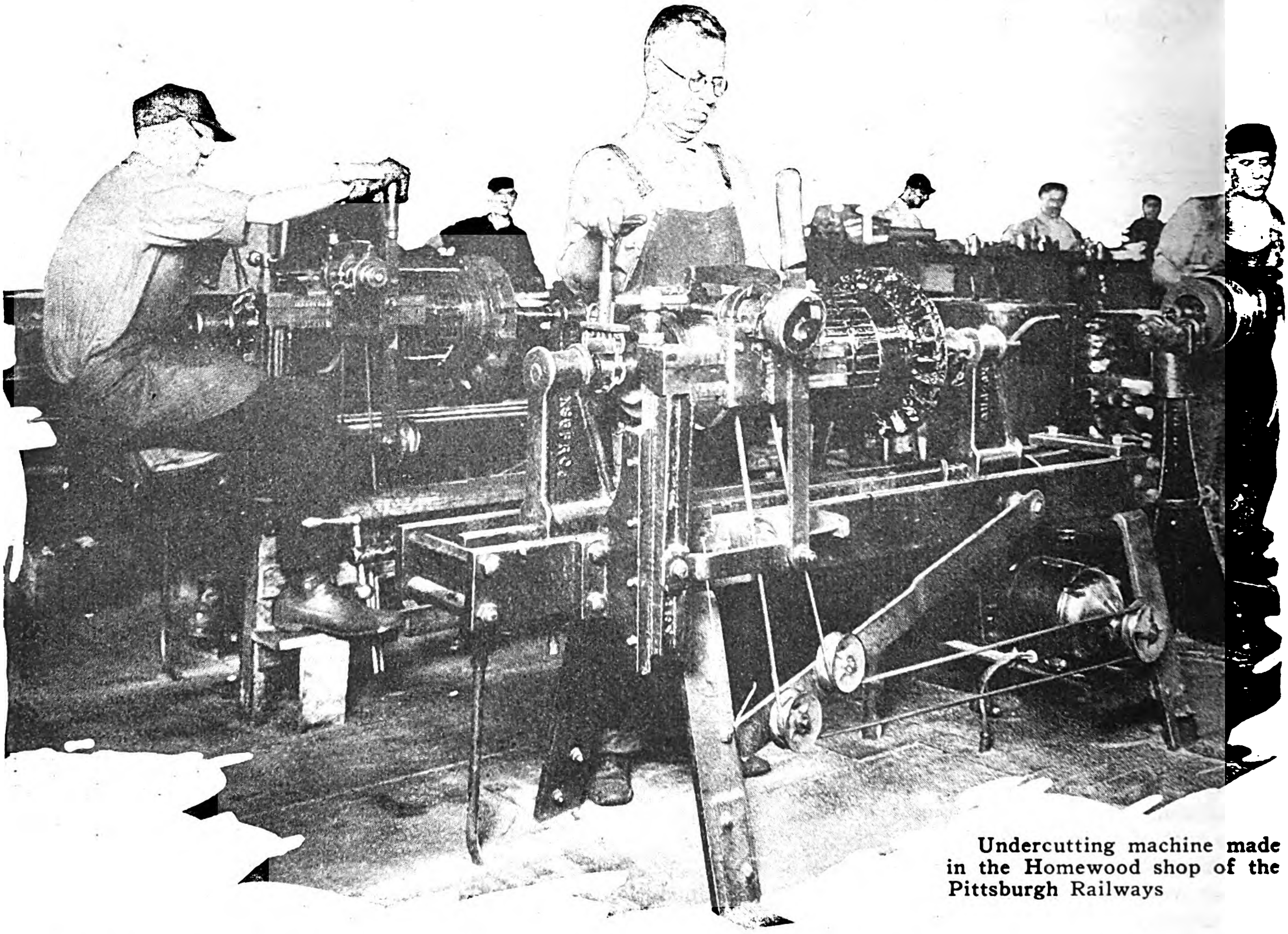
Data on Painting Car Roofs

THE time between paintings of car roofs was found to vary between six to eighteen months on several Southern railways. New Orleans paints once in eighteen months, Atlanta, Knoxville, Memphis and Birmingham paint once a year and Mobile paints twice a year. Dallas is using Gilsonite paint and has tried Valdura and Asphalt paints. The life of canvas roofs was found to vary up to a maximum of ten years.

Turning and Slotting of Commutators*

Modern railway motors are slotted. Mica should be removed carefully from the sides of the slot or the beneficial results from slotting will be lost. Depth of slots should be from 3/64 in. to 5/64 in.

By Jesse M. Zimmerman
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company,
East Pittsburgh, Pa.



Undercutting machine made in the Homewood shop of the Pittsburgh Railways

DIFFERENCES of opinion will always exist regarding the resurfacing of the commutator face by grinding or by turning. Each method has its advantages as well as its disadvantages. The greatest advantage of turning the commutator face is that the time required is very short. The kind of tool to use is not important and each machinist has his favorite tool for each different line of work. However, a diamond pointed tool slightly cupped at the top and set so that it will have sufficient clearance between its side and the commutator face will give very satisfactory results. The cutting edge of the tool should be located slightly above the center line of the armature. One can always feel that the commutator will have a smooth finish if the chips of copper curl up while machining. During the machining the commutator should run at its maximum operating speed. If the speed is too slow the tool will cut the copper deeper than the mica. In order to remove as little copper as necessary the cut should be made very light.

The final finish given the commutator is usually removal of the tool marks by No. 00 sandpaper. This should be done after the undercutting operation. Some repairmen have found that by running the commutator

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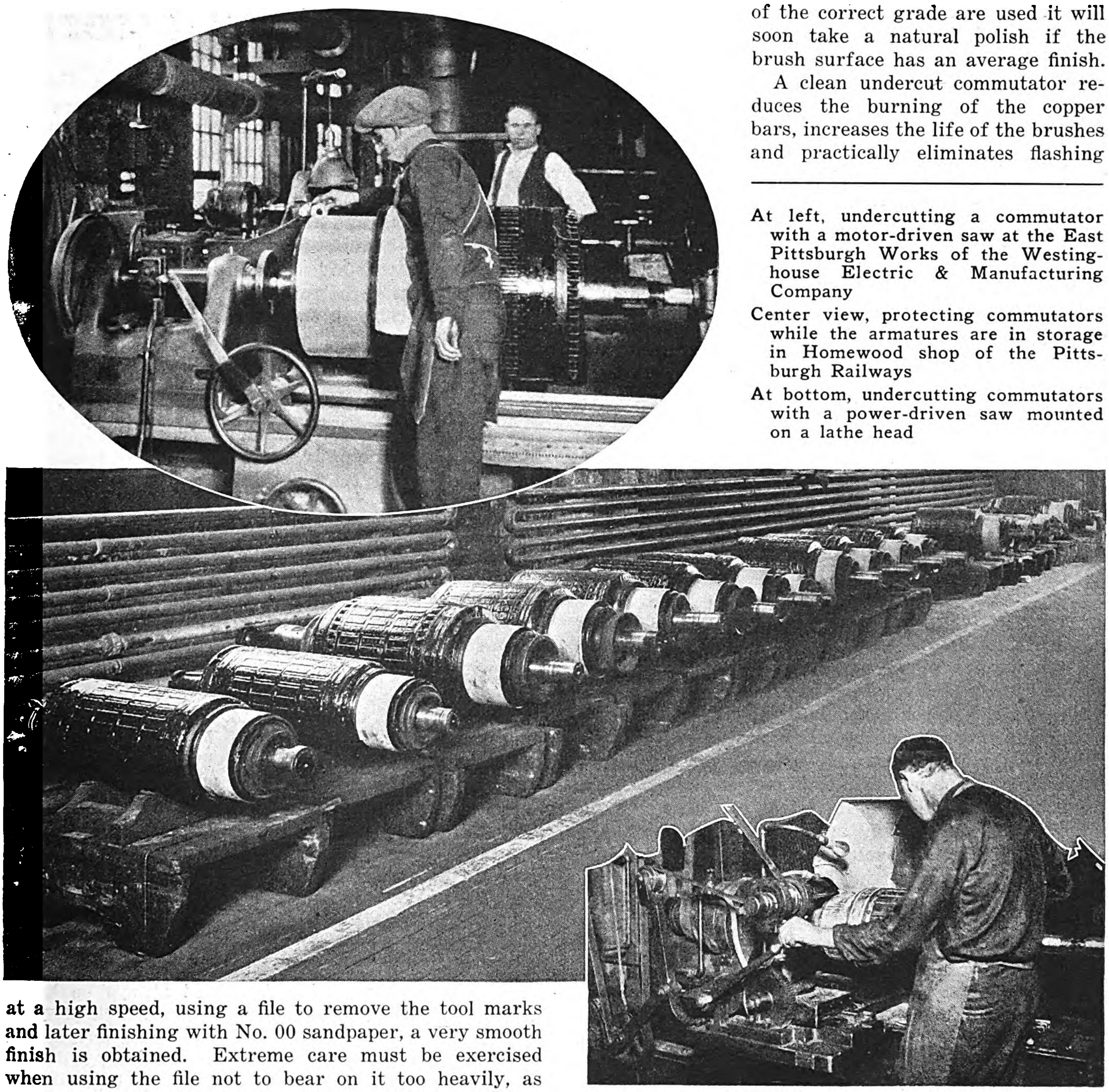
*This is the eighth of a series of articles on commutators for railway motors. The others were: Choosing Materials for Railway Motor Commutators, published Aug. 21, 1926; Important Considerations in Replacing Commutator Bars, published Oct. 23, 1926; Accurate Machining of the V's of Assembled Commutators Is Essential, published Nov. 20, 1926; Mica V-rings and Bushings Have Important Functions in Commutators, published Dec. 18, 1926; Methods and Equipment for Efficient Assembling of Commutators, published Jan. 15, 1927; Soldering of Railway Motor Commutators, published Feb. 19, 1927, and Preventing Flashovers Is an Important Part of Commutator Maintenance, published March 19, 1927.



At left, undercutting a commutator with a motor-driven saw at the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company

Center view, protecting commutators while the armatures are in storage in Homewood shop of the Pittsburgh Railways

At bottom, undercutting commutators with a power-driven saw mounted on a lathe head

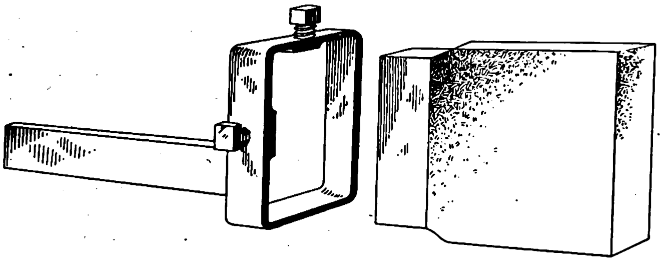
at a high speed, using a file to remove the tool marks and later finishing with No. 00 sandpaper, a very smooth finish is obtained. Extreme care must be exercised when using the file not to bear on it too heavily, as it has a tendency to cut very rapidly. This method has the disadvantage of removing too much copper from certain spots, making the commutator surface uneven. Both the sandpaper and the file have a tendency to cut the copper deeper than the mica.

The commutator face may be ground with a special carborundum stone which fits in the tool post of the lathe. It will remove a minimum amount of copper in resurfacing because the cuts made by the stone are very shallow. The last cut will produce a polish without need for file or sandpaper and give a true, smooth surface. The disadvantage of the grinding method is the length of time required. Some operators take a rough machine cut across the commutator surface when it is badly cupped and then use a carborundum stone for finishing. Other railway operators object to the use of the carborundum because the grit from the stone imbeds itself in the copper, causing the brushes to wear rapidly. Careful inspection of the commutator face will show whether this is so.

If the commutator is properly undercut and brushes of the correct grade are used it will soon take a natural polish if the brush surface has an average finish.

A clean undercut commutator reduces the burning of the copper bars, increases the life of the brushes and practically eliminates flashing because it prevents high mica, which is caused by the copper wearing the more rapidly so that the brushes will ride on the mica strips. This causes a burning action between the copper and the brush, which wears away the contact surface. If the burning action continues grooves will be burned completely around the commutator. When the mica is high at one part of the commutator only this burning action will eventually cause a flat spot, which will grow until it will be necessary to resurface and undercut the commutator.

Undercutting is done after the armature has been soldered and banded and the commutator face and neck resurfaced. It should never be done before the commutator has been soldered, as the undercut slot is liable to fill up with solder. Four essentials should be followed when undercutting a commutator. First, it is important that none of the mica remains in the slot. This can be prevented by using a saw which is at least 0.005 in. larger than the mica strip. After the undercutting a heavy hack saw blade should be drawn through



Lathe tool holder and carborundum stone for grinding commutators

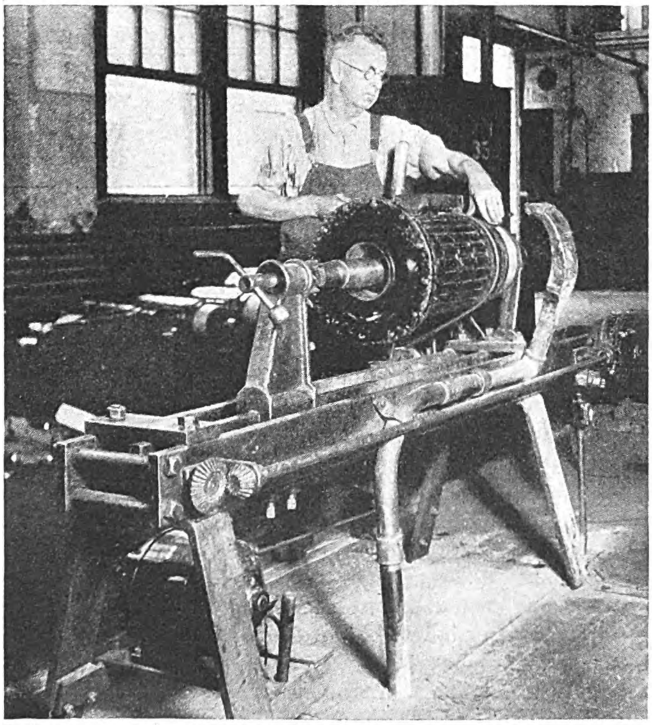
each slot to remove any mica which may remain in it. In order to undercut the entire face of the commutator without cutting into the neck the saw must be as small as possible, yet it must be large enough to undercut the commutator to the proper depth.

Commutators should be undercut with a high-speed carbon saw operating at approximately 2,000 r.p.m. This saw should be drawn toward the operator so that he can guide it when starting to cut. It should revolve so that the teeth will strike the bottom of the slot first. This will leave a clean slot on the brush surface.

An undercut commutator should operate from one heavy inspection period to the next. The maximum and minimum depth should be 5/64 in. and 3/64 in. respectively. However, the depth can be increased or decreased according to conditions. Should the armature be removed for minor motor repairs the commutator should be inspected carefully and if the mica is getting flush with the copper it should be undercut.

Undercutting is done by either a motor-driven or a belt-driven saw. Where only a few armatures are to be undercut a special knife or a hack saw is sometimes used, but this method is inefficient and slow. On the other hand, where many armatures are to be slotted the undercutting is usually done on a special machine.

An efficient undercutting outfit made in the shops of the Pittsburgh Railways is shown in the accompanying illlustration. This machine was made from an old lathe, the saw being belt driven from a ¼-hp. motor. After the commutator has been undercut, in order to polish the brush surface with sandpaper the armature is rotated by placing a belt around the armature connecting it directly to the motor.



Armatures are rotated by belt for polishing the commutator face after undercutting in the shops of the Pittsburgh Railways

Some operators have had good success with an undercutting outfit clamped to the tailstock of the lathe. The portable electric-driven outfits are popular in some of the smaller shops and give good results. The main objection to this type is the difficulty in guiding the saw. When making or purchasing an undercutting machine it is essential that the rotating spindle be supported by a bearing as close to the saw as possible. Any type of stationary undercutting outfit should have a hood and a suction hose to carry off the mica dust.

After the commutator has been undercut the bars have very sharp edges. If left, these will cause arcing and pitting. Once started, arcs between the bars will tend to concentrate on these edges, and may result in a flash. Eventually the bars will be pitted badly. It is important that these sharp edges be rounded off, which can be done by drawing a small three-cornered file through the slot.

After the commutator has been given its final finish, it should be protected from dirt, oil and moisture while the armature is in storage. The Pittsburgh Railways has adopted the scheme of covering the commutator face with several turns of wrapping paper.

Unnecessary Signal Lights Retard Traffic

HAPHAZARD installation of automatic signal lights not only delays traffic but may actually increase the congestion and danger at street and highway intersections, according to a report compiled by the Albert Russel Erskine Bureau for Street Traffic Research. It is stated by Miller McClintock, director of the bureau, that "automatic stop and go signals are unquestionably an effective means of controlling traffic, and their effectiveness has been proved by many installations that have speeded traffic and reduced accidents in Los Angeles and Chicago, but it should always be borne in mind that traffic signals stop traffic as well as move it, and that wherever a device of this kind is installed it immediately places an automatic limit on the time the intersecting streets may be used. In general, the time along one street is reduced 50 per cent—the signal giving alternate right of way to the streets controlled. Unless the alternate movement is necessitated by a real congestion at the intersection which reduces the opportunity for movement to a point below that permitted by the signal, it is apparent that the control device can have no other effect than to retard traffic flow.

"Stop and go signals should rarely, if ever, be installed for purely safety purposes. The primary purpose of the signal is to start and stop traffic to facilitate movement. Dangerous intersections where traffic conditions do not justify the maintenance of a stop and go signal can best be controlled by the installation of warning signs, and in some cases by the application of a through-stop street rule."

The danger of installing stop and go lights where they are not necessitated lies in the disregard for this type of regulation that grows when motorists are unnecessarily delayed. The willingness of the motoring public to give obedience to an unpoliced signal varies in ratio to the reasonableness of the control exercised.

Modernizing Work Car Equipment at Salt Lake City

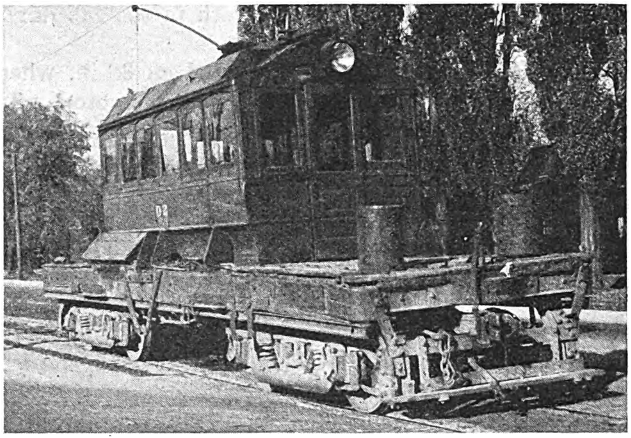
At a Cost of $1,700 an Electric Locomotive of the Utah Power & Light Company Has Been Completely Revamped and Adapted to Present-Day Conditions

By F. D. Heiges
Office Engineer Utah Light & Transit Company, Salt Lake City

STRIKING is the contrast between the dilapidated appearance of an old work car battered by years of service and the neat and trim look of the same car fresh from the hands of capable workmen. A transformation of this kind was recently accomplished in the case of an electric locomotive of the Utah Light & Transit Company. Air compressors, trucks, drawbar and electric equipment on the rebuilt vehicle are those that were on the old one. The frame and the body are new. Accompanying illustrations show this car before and after modernization. Reconstruction resulted in a substantial saving to the company, and also had considerable advertising value in that the operation of an up-to-date efficient looking locomotive over the streets of Salt Lake City gives the people the impression that the company is endeavoring to furnish high-class service with the best possible equipment of every kind.

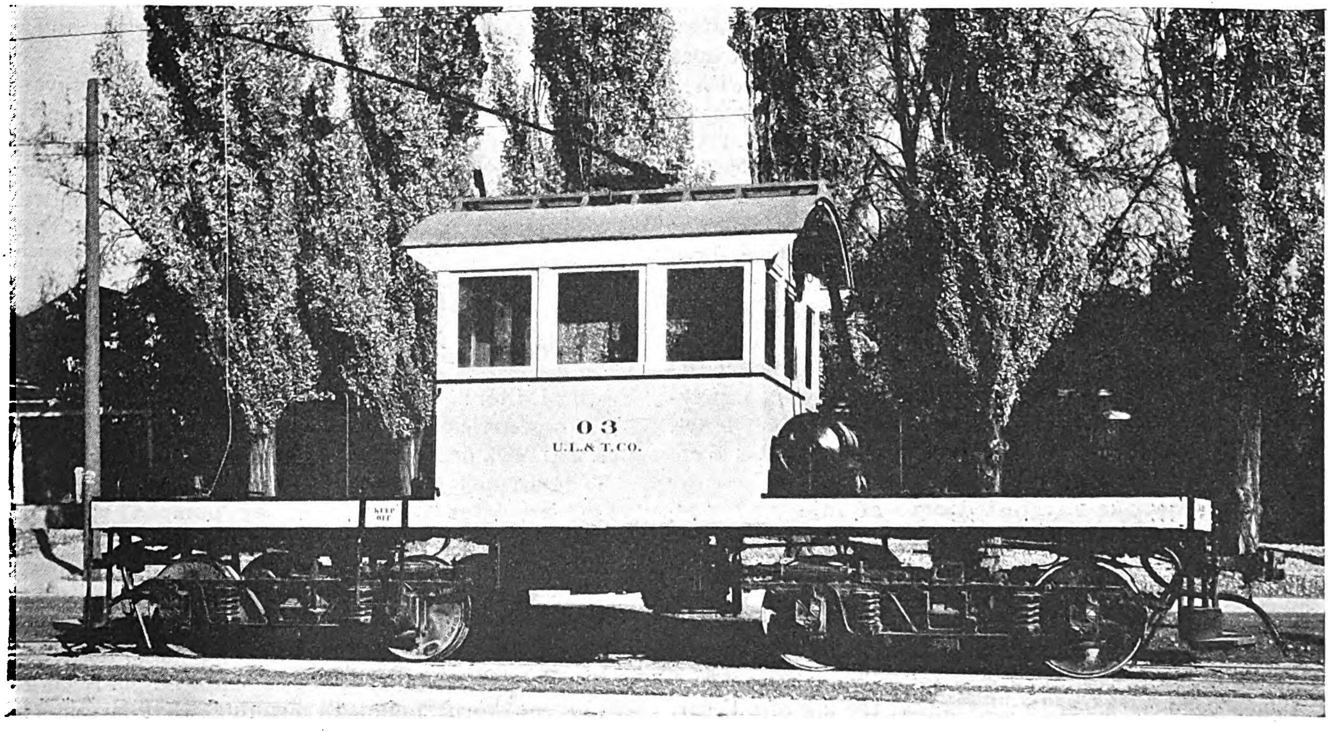
The old locomotive originated about 1909 by the installation of an obsolete street car body on a flat car and motorization of the trucks. Its color was black instead of the standard yellow of the company's other rolling stock.

After the old car had been completely dismantled the trucks were thoroughly overhauled, steam-cleaned and repainted. Upon these, in place of the old wooden frame, was constructed a steel frame 30x6 ft. in size consisting of two 8-in. channels running lengthwise on the outside, four 8-in. steel I-beams running through the center, and two 10-in. arched channel bumper plates forming the ends. The extra height of the 10-in. bumper plates above the 8-in. I-beams permits a 2-in. floor of tongued and grooved wood to be fitted under the ends. Steel strips have been placed along both edges of the floor as a protection to the surface.



This locomotive was built in 1909 by placing an old body on a flat car and motorizing the trucks

A cab was built 8 ft. 6 in. square. This is 13 ft. shorter than the old cab, while the frame itself is 3 ft. shorter. The greater length and narrow width of the old cab hampered the view of the motorman. Having a smaller cab on a shorter frame and flush with it permits the operator to have a clear range of vision on all sides and there is less likelihood of accidents. The center height of the cab is 7½ ft., while the side height is 6½ ft. It is built of steel and wood lined. In all there are ten windows, three on each side and two on each end. All the windows are movable in the new cab, while in the old cab only the center windows were movable. Doors are located at the ends, diagonally opposite each other, with the controller located at the center window on one side. Five electric heaters main-



The same locomotive after being thoroughly overhauled. A new frame and a new cab were installed on the old running gear tain a comfortable degree of warmth in the cab during cold weather.

This rebuilt locomotive is mounted on 33-in. wheels and is equipped with four Westinghouse 93 motors. The total weight is approximately 40,000 lb. All the wiring has been placed in conduits, another advantage over the old vehicle. The cab of the old locomotive was congested by the presence of air tank and compressor, while on the new locomotive the compressor is underneath the frame and the air tank is outside of the cab along the end wall.

The new body and the reconstruction work cost $1,700. Including the value of the old equipment used, the total valuation is about $8,500 for the vehicle. In utility it is believed to be the equivalent of an $11,000 car. Two locomotives were rebuilt in this way, effecting a saving estimated at $5,000.

The Readers' Forum

Difficulties in Wheel Removal Discussed

INDIANA, COLUMBUS & EASTERN TRACTION COMPANY
SPRINGFIELD, OHIO, April 4, 1927.

To the Editor:

I have read with considerable interest the article "Wheels Removed and Pressed on Economically," on page 331 of the Feb. 19 issue of ELECTRIC RAILWAY JOURNAL. Just to make it more interesting, I wish to criticise the practice of the Wilkes-Barre & Hazleton Railway, as I think it can be improved upon.

In the first place I do not approve of burning the wheels in order to remove them from axles. I note they have a 400-ton wheel press, and that 36-in. wheels are bored 7 in. and put on at 75 tons, which is standard practice. It is true that it will require probably twice this pressure to remove these wheels after they are worn out, due to the metals of wheel and axle settling into each other under continued pressure and vibration. We have found that a method of removal much cheaper and better than burning is to heat the wheels with a large coal-oil torch. This does not injure the wheels in the least, which is worthy of consideration for the reason that frequently wheels removed from axles are used again for some purpose.

The practice at the I., C. & E. shops is as follows: 100 tons is considered a maximum safe pressure for a 5-in x 9-in. axle. A pressure of 100 tons is first applied; if the wheel does not start, the flame from a torch is applied for about five minutes, and pressure is then again applied, letting the flame still play on the hub of the wheel. If the wheel does not start, a pressure of about 100 tons is kept on until it does start, which is rarely more than seven or eight minutes from the time of first applying the torch.

There is not the slightest danger of injury to case-hardened or heat-treated gears in this process, as the temperature of gear or hub rarely exceeds that of boiling water, or 212 deg. F., while with the cutting process there is some danger of injury to a gear and also to the surface of the axle and journal bearings unless protected thoroughly.

The second criticism I make is that the use of a thrust cylinder and mandrel in putting on wheels is cumbersome, slows up the work and is not at all necessary. If ends of axles are faced off square with the center line and the pressure faces on the wheel press are kept in good order there is no danger of springing an axle if allowable pressures are not exceeded.

F. J. FOOTE,
Superintendent Motor Power and Equipment.

Judging Maintenance by Car Failures

DES MOINES CITY RAILWAY
DES MOINES, IOWA, April 6, 1927.

To the Editor:

The discussion of car failures in ELECTRIC RAILWAY JOURNAL has been very interesting. This is important, first from the point of judging the degree of maintenance and second from the transportation standpoint. The mechanical and transportation departments must be in perfect accord or the car failures per 1,000 miles cannot be kept at a low point. Car failures cause the car riders much discomfort, as no one likes to change to another car during the short ride downtown even in good weather, not to mention in bad weather, when troubles generally happen.

It is only by frequent and thorough overhauling of the equipment and a strict method of inspection that the mechanical department can deliver the service it should. In addition, all car failures must be gone into carefully and steps taken to prevent future ones of the same nature.

Cars on this property are overhauled on a 100,000-mile basis, including painting. They are inspected on a 1,200-mile basis, except the brakes, which are given attention every 600 miles. Oiling of armature and axle bearings is taken care of at every 1,200-mile inspection, while journal bearings and gears are lubricated every 4,800 miles.

There seem to be many different ways on the various properties of classifying a car failure. If we find it necessary to pull a car off before its run has been completed, it is considered a car failure, of which a certain number are chargeable to equipment and a certain number are not chargeable to equipment. Every item is chargeable to equipment except broken glass and collisions.

Although the pull-in of many cars can be prevented by having a man repair cars on the road, we do not believe this to be a satisfactory practice on account of delays and discomfort to passengers while the man is making the repairs. About the only road work we do is to replace burned out lamps. C. R. MCMAHON,
Superintendent of Equipment.

Cast Bars Not Drop Forged

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
WILKINSBURG, PA., April 1, 1927.

To the Editor:

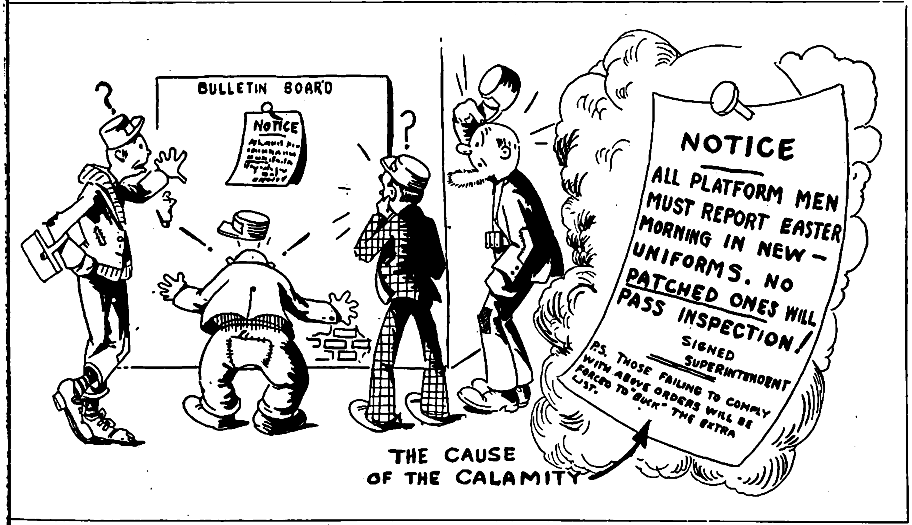
In my article in ELECTRIC RAILWAY JOURNAL for Oct. 23, 1926, one sentence read:

"The Brinell hardness number for cast copper bars which are later 'drop forged' or 'bumped' is from 50 to 55."

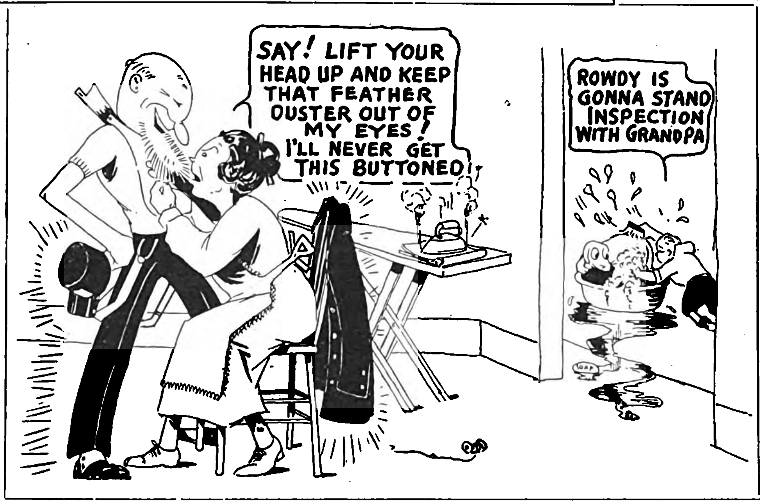
The use of the word "drop forged" was somewhat ambiguous. It was not my intention to convey the impression that "drop forged" bars are cast, but it was my intention to state that the Brinell hardness number for cast copper bars which are later "bumped" is from 50 to 55, by the word "bumped" meaning what is sometimes termed "cold pressed bars."

JESSE M. ZIMMERMAN

Adventures of Old Man Trouble *on the* Hicksville Railway

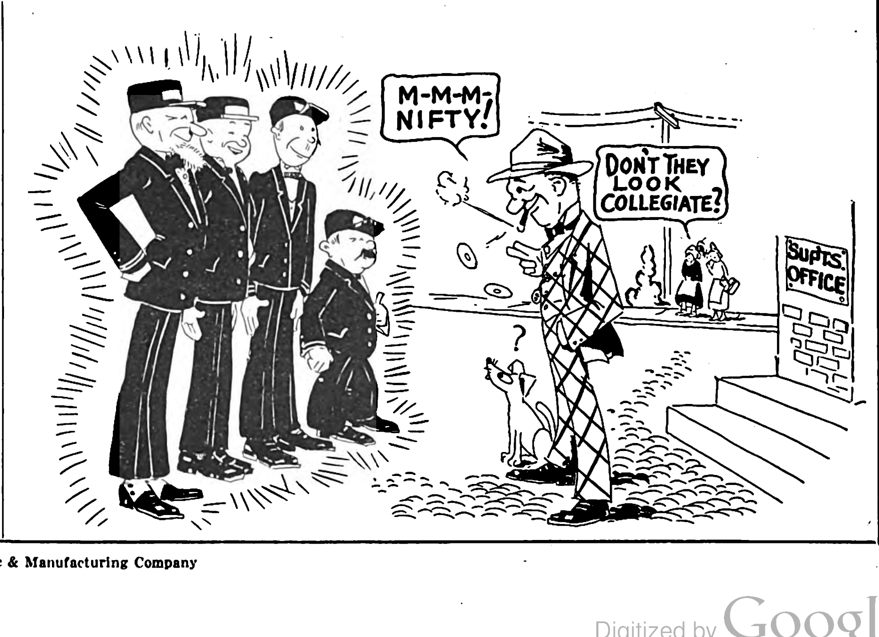

BULLETIN BOARD
NOTICE
NOTICE
ALL PLATFORM MEN MUST REPORT EASTER MORNING IN NEW-UNIFORMS. NO PATCHED ONES WILL PASS INSPECTION!
SIGNED SUPERINTENDENT
P.S. THOSE FAILING TO COMPLY WITH ABOVE ORDERS WILL BE FORCED TO "BUCK" THE EXTRA LIST.
THE CAUSE OF THE CALAMITY

The Annual Easter Inspection— Would Not a Weekly Inspection Be Better?


SAY! LIFT YOUR HEAD UP AND KEEP THAT FEATHER DUSTER OUT OF MY EYES! I'LL NEVER GET THIS BUTTONED!
ROWDY IS GONNA STAND INSPECTION WITH GRANDPA

Neat platform men are a continual advertisement that the electric railway is a live, vivid part of the community's life. Car operators are in daily contact with the railway's customers. Their neat appearance should be a part of the clean, tidy condition of the cars.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page free of charge for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.


M-M-M-NIFTY!
DON'T THEY LOOK COLLEGIATE?
SUPTS. OFFICE

J. M. Zimmerman and E. L. Proctor, Westinghouse Electric & Manufacturing Company

Fifteen Cash Prizes Offered tc

WITH a desire to stimulate the improvement of railway maintenance methods and to assist in spreading information regarding practices and equipment that are proving of value, ELECTRIC RAILWAY JOURNAL will award three capital prizes of $200, $100 and $50 for the three best maintenance ideas submitted before Aug. 1, 1927. In addition twelve monthly prizes of $25—one each month beginning with the May 21, 1927, issue—will be given. The articles submitted for the capital prizes will be published in the maintenance data sheet section of the issue of ELECTRIC RAILWAY JOURNAL devoted to maintenance and construction. A minimum of $5 will be paid for each article submitted in this competition which is accepted for publication.

The purpose of the competition is to arouse interest among maintenance men in the development and adoption of improved methods for performing routine work, or new methods or fixtures that save labor, time and money for the electric railways.

The prizes will be awarded primarily on the value of the idea presented and its adaptability to the maintenance work of electric railways generally. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated, and the extent to which information is given which will be needed by other properties interested in using the idea. Fine writing is not necessary. It is the intention to make the prizes available to men engaged in practical maintenance work. Therefore all that is necessary is a concise and clear statement that will be in a form to help other maintenance men. At least one photograph, drawing or sketch is required.

Rules for the Competition

THE competition will be judged and the prizes awarded by a committee consisting of men in the industry intimately associated with the line, rolling stock, and way departments, whose affiliations particularly fit them to pass on the subjects covered in the maintenance data section, and the editor of ELECTRIC RAILWAY JOURNAL. The names of the judges will be published later. All decisions of the judges in making awards or in interpreting the conditions of the contest will be accepted as final. The articles submitted will be judged in accordance with the following conditions:

1 Any employee or official of an operating electric railway or electric railway bus subsidiary may compete for the prizes.

2 Each contestant may submit any number of items he desires, each of which will be judged separately. An individual may win several of the prizes. One item may win both a capital prize and a monthly prize.

3 The author does not necessarily have to be the originator of the idea, but it must be adopted and be in use on the property with which he is connected. The idea submitted may have originated on another property or may have been furnished by a manufacturer. No device or method a description of which, to the knowledge of the contestant or the judges, has been previously published will be eligible for this competition.

4 The competition is not limited to those who originated or developed the idea or apparatus described. Any employee, with the approval of the department head concerned, may submit a maintenance practice or device used on his property. More than one article covering the same device or method will not be accepted, however.

5 Where the management of a railway has a practice of requiring approval of articles sent out for publication such approval must accompany the manuscript. If written approval does not accompany the manuscript it will be assumed that such approval is unnecessary.

aintenance Men

6 An article may be submitted by several persons or by a department, and need not be written by the person in whose name it is submitted. The prize will be awarded to the individuals or department whose name appears on the manuscript, and can be distributed among the winners on any basis they may desire. Should there be a tie for any prize the full amount will be awarded for each of the articles involved in the tie.

7 Articles may describe any maintenance practice or device used by any department of a railway such as the maintenance of rolling stock, buses, shop equipment or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc.

8 Due to the limited space available in the maintenance data pages, articles submitted for these prizes should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of necessary information will be given weight in judging articles. In no event should they be longer than 400 words with not more than two illustrations. Articles will be published as promptly as space permits.

9 In rating the various articles the committee will consider the primary value of the method or device as of highest importance. The committee will also consider its practicability, the advantages and economies that are set forth. In rating manuscripts for the capital prizes the committee will also consider the clearness and completeness with which the idea is presented in the original manuscript.

10 All articles must be in the English language and be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue and 36th Street, New York City. To be eligible for the capital prizes to be awarded the envelope must bear a postmark dated before Aug. 1, 1927. Envelope and manuscript should be marked "Maintenance Competition." Any number of items may be sent in the same envelope. Photographs or sketches should accompany manuscript and be attached thereto. Drawings or sketches may be in pencil, or blue prints will be accepted. Photographs should be protected against damage in mailing. Each item submitted should bear the name or names of the individual or individuals for whom it is submitted and to whom awards are to be made. Articles will be published under the names of individuals or department appearing on the manuscripts. Photographs, sketches and manuscripts should be so marked that should they become separated they can be identified readily.

11 The original manuscripts and illustrations will be turned over to the committee of judges to determine which will receive the capital prizes. These may, however, be published before or after capital prizes are awarded. Monthly prizes will be judged by the committee after the articles are published in the maintenance data section, the best items being selected each month from those appearing in the issue in the month devoted to maintenance and construction.

12 The announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the one containing the item.

13 Any material submitted may be published at any time after its receipt that the editors of ELECTRIC RAILWAY JOURNAL decide.

14 The winners of the capital prizes—for the best idea $200, for the next best $100, and for the third best $50, will be announced in the annual convention number of ELECTRIC RAILWAY JOURNAL to be published in September, 1927.

15 All articles submitted will become the property of ELECTRIC RAILWAY JOURNAL and no manuscripts will be returned.

More Comments on Annual Maintenance Issue of March 19

A. E. HAAK, general superintendent the Gray Line Motor Tours, Colorado Springs, Col., writes:

The Maintenance Number of ELECTRIC RAILWAY JOURNAL for March 19 is certainly very interesting. One of the outstanding items in the issue is the review of improved equipment for maintenance operation. It certainly will help the shop forces. We are passing the number to all of our departments and we are sure that they will be benefited greatly by reading all the items covering maintenance suggestions.

H. R. MEYER, renewal parts section Westinghouse Electric & Manufacturing Company, says:

I wish to compliment you on the new maintenance data section which appeared in your Annual Maintenance Number. It will be of unquestionable help in getting before all railway men the things which have been accomplished in an engineering way or from a maintenance standpoint. In a previous issue there was an article by Mr. Williams of the Department of Street Railways, City of Detroit, calling attention to the need for a real good method of correlating engineering information and putting it in such form that it would be of use to electric railway men. It seems to me that the new department which you have started in ELECTRIC RAILWAY JOURNAL will do more toward taking care of this situation than anything that has been done so far.

G. H. STIER, superintendent of rolling stock and buildings, Philadelphia Rapid Transit Company, says in part:

We feel that the step which you have taken in establishing a special maintenance notebook section is an interesting one. The material which you propose to publish in this section will be of particular interest and benefit to all parties interested in the maintenance of electric railway equipment. Having the information presented in a form which will make it possible to bind the sheets together in compact form, while at the same time the copies of the JOURNAL will not be rendered unfit for binding purposes, seems a good plan.

KEITH CONNER of the Jamestown Street Railway, Jamestown, N. Y., says:

Fine! Expect to receive much valuable information through your new department.

C. R. MCMAHON, superintendent of equipment Des Moines City Railway, says:

There are so many good things in the March 19 issue that I hardly know which to mention first, but really I believe that your new section of maintenance data sheets will prove very popular with the readers. It surely will with me. I was interested greatly in the articles by various maintenance superintendents, especially the 100 per cent operation of Chicago surface lines, the article by J. S. McWhirter on car cleaning and the article by A. T. Clark of Baltimore on car painting. The section on improved equipment calls to our attention new devices which might otherwise escape our notice.

C. J. JONAS of the Cincinnati Street Railway writes:

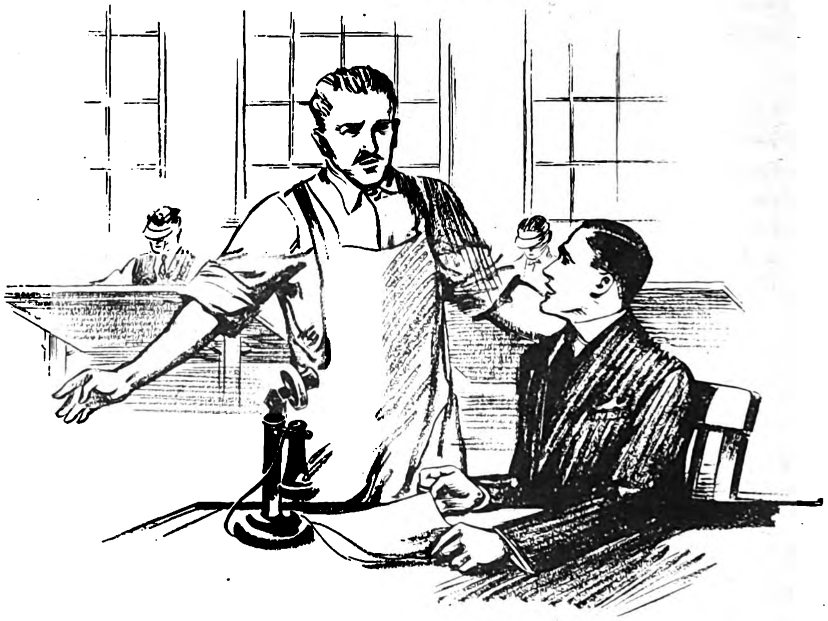
I know of no better way to serve the maintenance men than the JOURNAL as it is now being conducted.

S. L. VAUGHAN, vice-president and general manager Grand Rapids, Grand Haven & Muskegon Railway, said:

I have looked over the March 19 issue very carefully and find some very interesting articles. I think your scheme of publishing monthly maintenance numbers is good.

Dick's Enemies Keep Active

And Provoke a Crisis



WHILE Dick Prescott, assistant shop superintendent of the Consolidated Railway & Light Company, was engrossed in the work of raising the company's maintenance standards and improving shop practices, those to whom progress is anathema and to whom energy and ability in others always loom as a threat to their own personal prestige became more and more uneasy.

Pete Welsher, shop inspector, saw in Dick's ability not only a definite obstacle to his own ambition but a positive menace to the privileges which he had built up for himself in the shop. He was amazed at the rapidity with which the young superintendent gained knowledge and experience. Being lazy himself, he realized that Dick was ready to pay a price in hard work and devotion to the job with which he was powerless to compete. There loomed before him constantly the fear of being shown up in his true light as a shirker and a loafer.

But what Pete lacked in energy he made up in cunning. He never lost an opportunity among the men of casting aspersions on Dick, but he was careful to do so by inference rather than direct statements. His position as inspector fell in well with these private ends. He nagged the men, found fault with the work, issued orders that were unfair, but always left the impression that he was merely carrying out Dick's instructions. Among his own small clique of cronies he talked continually of an imaginary flood of orders and regulations that were supposed to originate with the assistant superintendent. They, in turn, were quick to pour their own versions of disagreeable things to come into the ears of the worried and dissatisfied men.

That definite trouble would ultimately result was inevitable. Pete was wise enough to know that the carpenter shop would not be healthy for his scheming. Steve White, the foreman, was too alert and too close to his friend Dick. Besides, Dick had worked there as a carpenter's helper when he first came to the Consolidated, and most of the men liked him and were pleased at his rapid promotion. But in the truck shop slow old Bill Johnson was not aware of what was going on until it was too late.

One morning just after Dick had arrived at his office Bill Johnson came in with a worried look on his face.

"Hello, Bill," said Dick pleasantly, "what's on your mind?"

"I got some trouble down at the shop, Prescott; men won't go t'work."

Electric Railway Journal Maintenance Data Sheet

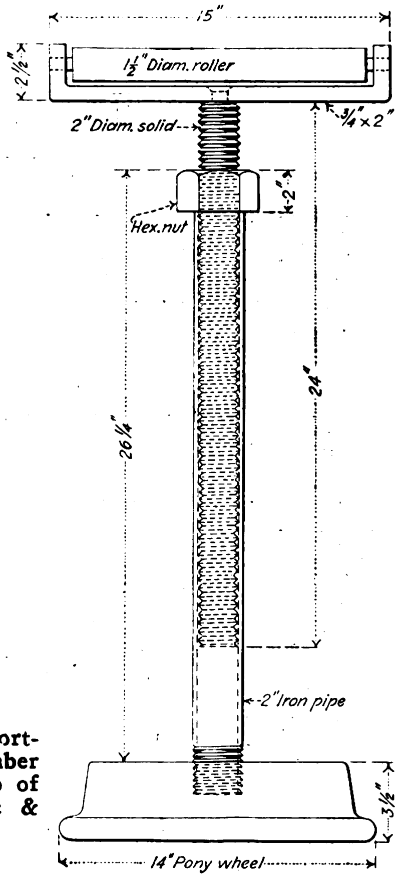
ROLLING STOCK—CARPENTER SHOP—1

Lumber Roller Supporting Stand

HANDLING of long pieces of lumber during the sawing, planing and milling process in the carpenter shop of the Virginia Electric & Power Company, Richmond, Va., has been simplified greatly by design and adoption of a portable roller supporting stand. It was designed and constructed in the shop under the supervision of the master mechanic, W. J. Hicks.

A piece of 2-in. pipe 26¼ in. long is screwed into the drilled and tapped hub of a 14-in. pony wheel. It projects approximately 24 in. above the face of the wheel. A round steel bar 24 in. long is threaded and installed inside of this pipe through a 2-in. hexagon nut. This nut supports the weight of the roller bracket, roller and rod and rests upon the end of the pipe. On top of this threaded rod is riveted a ¾x2-in. flat bracket designed to support a 1½-in. round roller 15 in. long over all.

This stand is very rugged and it can be transported easily to any part of the shop. It is free to revolve, is 25 in. high and can be adjusted to suit almost any condition by turning the 2-in. hexagon nut. Several of these stands have been built in the company's shop and have proved of great value, particularly in the carpenter department.


15"
1½" Diam. roller
2⅛"
2" Diam. solid
¾"x2"
2"
Hex. nut
24"
26¼"
2" Iron pipe
3½"
14" Pony wheel

Roller stand for supporting long pieces of lumber in the carpenter shop of the Virginia Electric & Power Company

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL DIAGRAMS—1

Field Winding Diagrams for Westinghouse 101B Motor

TO MAKE certain that the pole faces of a motor have proper sequence of polarity, it is essential that the coils be installed correctly. The accompanying diagrams are for the Westinghouse type 101B motor. The one on the left is for motors with leads on the axle side and the diagram on the right is for motors with the leads on the suspension side.

It is the practice of manufacturers to stamp the style number of main field coils on a tag attached to one side of the coil. The proper position of each coil in the frame is also indicated by a tag.

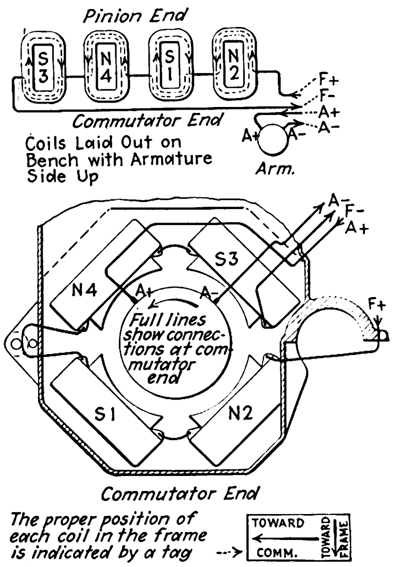
POLARITY TEST

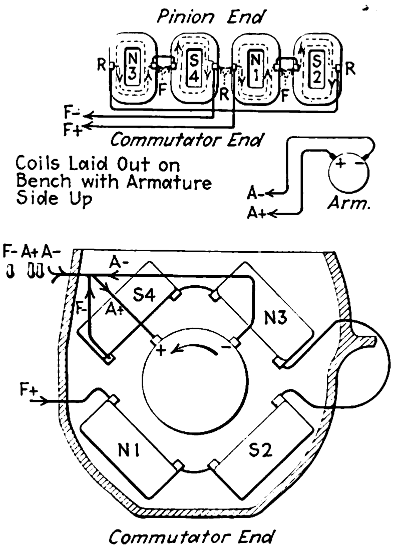
In the accompanying diagrams

N = north pole.

S = south pole.

With a compass, check the polarity of coils laid out on a bench, also after assembling in the frame. Use a resistor between the trolley connection and coils to give about 5-amp. current, flowing as shown by arrows in the diagram.


Pinion End
S3
N4
S1
N2
F+
F-
A+
A-
Commutator End
Coils Laid Out on Bench with Armature Side Up
A+
A-
Arm.
A-
F-
A+
S3
N4
A+
A-
Full lines show connections at commutator end
F+
S1
N2
Commutator End
The proper position of each coil in the frame is indicated by a tag
TOWARD
COMM.
TOWARD FRAME


Pinion End
R
N3
F
S4
R
N1
F
S2
R
F-
F+
Commutator End
Coils Laid Out on Bench with Armature Side Up
+
-
A-
A+
Arm.
F- A+ A-
A-
S4
F-
A+
N3
+
-
F+
N1
S2
Commutator End

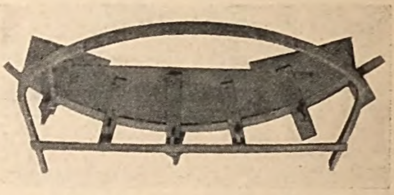
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—CARPENTER SHOP—2

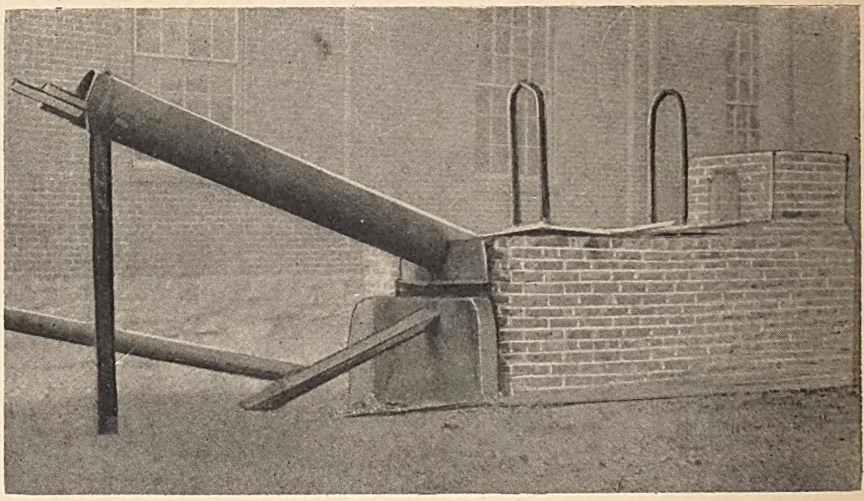
Refuse Used to Generate Steam for Wood Bending

REFUSE which can be burned easily, such as sawdust, shavings and small pieces of wood and other material which has to be disposed of from the shop of the Reading Transit Company, Reading, Pa., is deposited in a specially constructed fire box, burned, and the heat utilized for the steaming of wood to permit of easy bending.

This fire box, which is made of brick, is about 8 ft. x 6 ft. and 4 ft. high. Extending from one end is a 12-in. galvanized iron pipe of sufficient height to create a suitable draft and imbedded in the chimney base is a 12-in. iron pipe projecting through the fire box at an angle of about 45 deg. This pipe is partially filled with water and the flames surrounding that portion in the fire box soon cause the water to boil. The wood to be steamed is placed inside of the steam pipe. The box has suitable hinged covers and stops.



Wood bent after steaming



Refuse fire box, chimney and steam pipe for steaming wood to bend

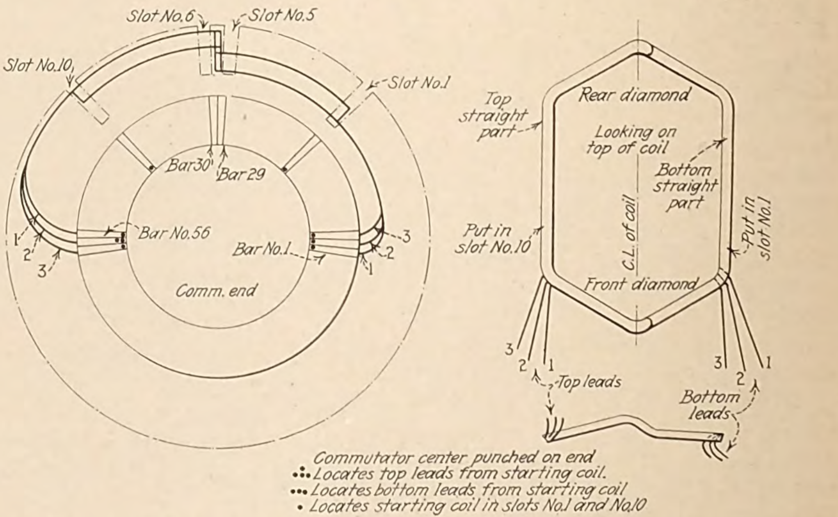
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL DIAGRAMS—2

Armature Winding Diagram for Westinghouse 101B Motor

IT IS very important that the connections of armatures be made correctly when they are rewound. Many railways obtain their winding information from the armature itself as it comes in for repair. Mistakes are sometimes made where information is obtained in this manner. The following information is given out by the Westinghouse Electric & Manufacturing Company and can be relied upon as being correct for the type 101B motor.

1. The center line of the starting coil is on the center line of the tooth between armature slots 5 and 6 and on the center line of the mica between commutator bars Nos. 29 and 30.
2. Starting at bar No. 29 count back clockwise to bar No. 1 and in this bar place lead No. 1 from the bottom leads of the starting coil.
3. Count from bar No. 1 forward counter clockwise to bar No. 56 and in this bar put lead No. 1 from the top leads of the starting coil.


Slot No.6
Slot No.5
Slot No.10
Slot No.1
Bar30
Bar29
Bar No.56
Bar No.1
1
2
3
1
2
3
Comm. end
Top straight part
Rear diamond
Looking on top of coil
Bottom straight part
C.L. of coil
Put in slot No.10
Put in slot No.1
Front diamond
3
2
1
Top leads
3
2
1
Bottom leads
Commutator center punched on end
.:. Locates top leads from starting coil.
... Locates bottom leads from starting coil
. Locates starting coil in slots No.1 and No.10

Winding Data

Number of armature slots	37
Number of commutator bars	111

Coils lie in slots No. 1 and No. 10.
Leads connect to bars No. 1 and No. 56.

It is the practice of the manufacturer to center punch commutator bars on the end for convenience in rewinding. The accompanying diagram gives the center punch marks that are standard for this motor.

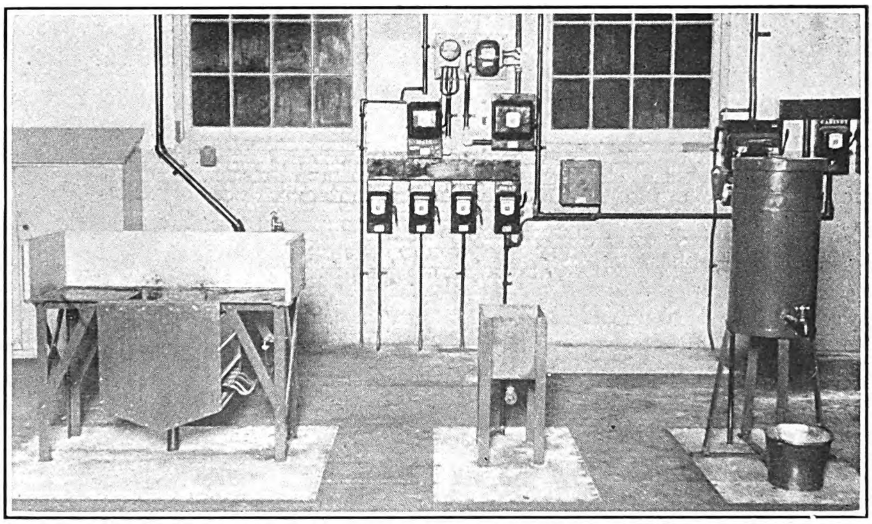
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—9

Electrically Heated Equipment for Shop Purposes

HEATING of pinions and lubricating oils used for car journals and motor bearings as well as heating a cleaning solution used for greasy metal car parts is being done effectively with some new equipment at Division 2 carhouse of the Los Angeles Railway, Los Angeles, Cal.

The tank at the left in the illustration, of 24 gal. capacity, is for heating the cleaning compound. It is made of sheet metal thoroughly insulated to retain heat. This class of cleaning was done formerly with gasoline or distillate. The new apparatus eliminates the fire risk and also does the work much more easily.


Equipment for electrically heating cleaning solutions, pinions and oils

The small tank shown in the center of the illustration is for heating pinions. This has a capacity sufficient to cover three pinions at once. After a pinion is immersed the boiling point temperature is maintained for one hour before it is removed. This tank is equipped with heating elements of the immersion type having a load capacity of 6 kw.

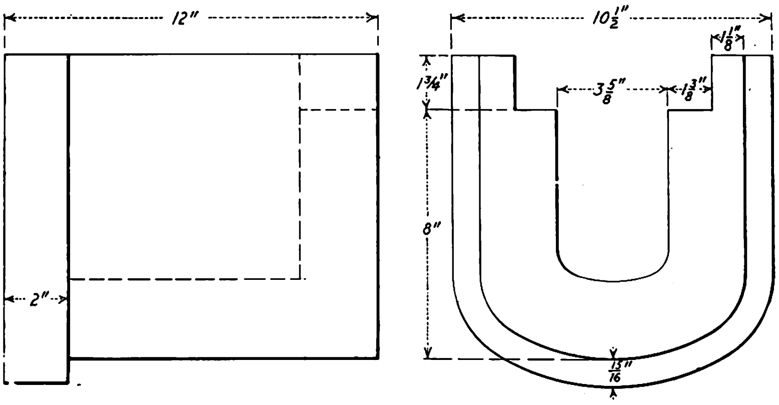
The round tank shown at the extreme right is used to heat oil for lubricating purposes. It is made of metal and has a heat-insulating compound between the inside and outside walls. The electric heating units are of the clamp-on type and are imbedded in the heat insulation. Heat is distributed uniformly to the inside tank, which has a capacity of about 10 gal. Thermostatic control makes it possible to keep the oil at the proper temperature regardless of weather conditions.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—11

Pinions Pressed On and Off by Wheel Press

PINIONS are being pressed on and off armature shafts cold in the shop of the Lynchburg Traction & Light Company, Lynchburg, Va., in a wheel press with the aid of a special horseshoe-shaped metal block, designed by Master Mechanic Cochran and built in the shop. This block has a strong collar projection to fit snugly a recess in the tailstock of the press, while an inside shoulder takes the pinion thrust when pressure is applied to the armature shaft during the removal.



Appearance of the horseshoe block used for pressing off pinions in a wheel press in Lynchburg, Va.

To press on a pinion the armature is suspended between the tailstock and the ram, with the commutator end of the shaft placed against the tailstock. The pinion is started on the shaft by hand. One end of a sleeve is placed against the face of the pinion and the other end against the ram. Gradual pressure forces the pinion onto the shaft, the sleeve equalizing the pressure on the pinion surface and eliminating the possibility of injury to the pinion nut threads.

To remove a pinion the armature is swung outside of the tailstock and the pinion inserted into the horseshoe-shaped block with its inside face resting against the shoulder. A copper-tipped steel bar is inserted between the ram and the armature shaft with the copper tip against the shaft. A gradual pressure presses the shaft from the pinion.

It is understood that with this method not a single pinion has become loose for the past five years.

More About Improved Equipment

for Electric Railway Maintenance

SIXTEEN pages devoted to short articles about improved equipment for maintenance work appeared in the annual maintenance issue of ELECTRIC RAILWAY JOURNAL dated March 19, 1927. Even this amount of space was insufficient to describe all the devices about which information was received. The following pages contain another installment and more will follow in subsequent issues.

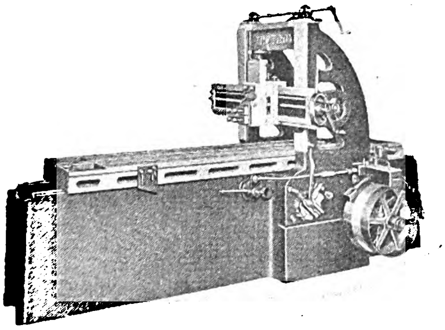
Many favorable comments have been received from the readers of this paper as to the value of this section. By illustrating some of the latest tools that can be adapted to electric railway work, those responsible are able to visualize the shortcomings of the particular equipment that they are using and so provide for changes that will put maintenance work on a higher plane and enable it to be done with less cost to the company. The most efficient system is one that uses its cars the greatest proportion of the time. Modern machine tools speed up repairs and so make cars available for service sooner than could otherwise be expected.

◆

Improved Whitcomb Second-Belt Drive Planer

REED-PRENTICE CORPORATION
Worcester, Mass.

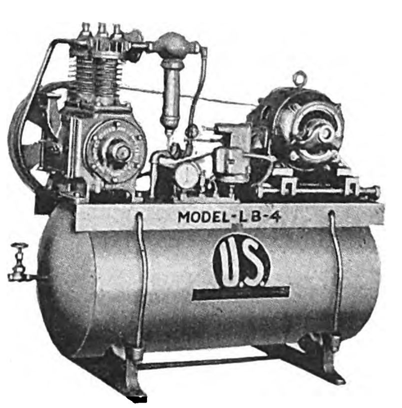
SECOND-BELT drive as used in the planer shown is the result of more than 70 years of study in the design and manufacture of such machines. The bed, which is cast solid on top except where the driving pinion engages with the rack, is of heavy box section having a bearing full length on the floor. The table is also of box construction of unusual width and thickness and is braced at short intervals with ribs to guard against any possibility of springing. Provision is made for lubricating the tracks of the bed by a simple oil leveling system, each track being fitted with a series of automatic oil rollers. The housings are of box form, bolted to the bed. By means of the second-belt drive a number of gears in the bed are eliminated. A belt-shifting mechanism shifts the moving belt quickly and noiselessly entirely off the tight pulley before starting to move the other on. The drive pulleys as well as the second-belt pulleys are made of a light-weight aluminum alloy which reduces their inertia and consequently the horse-power required. The cross-rail binder is constructed so that it can be locked to the housing by a simple movement of a lever without the use of wrenches or moving from the operating side of the planer. No wrenches are required for moving the shifter dogs. They are self-locking and are released by finger pressure upon a small lever. A two-speed countershaft, designed to meet the demand for more than one cutting speed, is furnished with the standard equipment. Two different types of motor drive can be used if desired, the plain overhead motor drive and the other belted. With the plain overhead drive a motor and countershaft are mounted on the top of the housing, with a belt from the countershaft pulleys to the main driving pulleys of the machine. The belted motor drive has a self-contained countershaft on the housings. This may be located either on the floor or at the rear of the planer or on a building wall.



Air Compressor Equipment

U. S. AIR COMPRESSOR COMPANY
Cleveland, Ohio

SPECIAL air compressor equipments for use in automobile repair shops and gas and oil stations have been developed by the U. S. Air Compressor Company. This equipment can be used for the inflation of tires, spraying springs with penetrating oil, cleaning motors, operating air lift, grease racks, gasoline pumps, spray painting under the fenders and in various other manners.

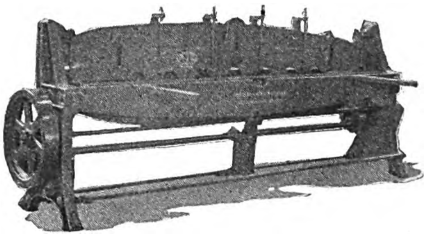


These machines are made in two sizes, the LB-4 and the LB-6. The LB-6 machine is a single-stage, air-cooled unit furnishing a tank pressure of 90 to 125 lb. and has a displacement of 16 cu.ft. of air per minute. The LB-4 machine is a two-stage, air-cooled unit furnishing a tank pressure of 165 to 200 lb. and has a displacement of 12 cu.ft. of air per minute. This constant tank pressure is maintained under all conditions by an automatic controller.

Power Squaring Shears

PECK, STOW & WILCOX COMPANY
Southington, Conn.

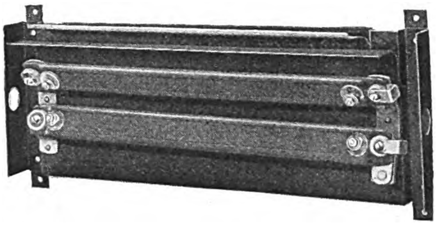
PEXTO power squaring shears are constructed with heavily braced housings designed to maintain the original alignment. The downward thrust is absorbed by a heavy ledge on the housing. These machines will resquare sheets which have been cut roughly in mill shears and cut sheets into strips, trim edges of sheets, cut squares, rectangular or other straight-sided blanks. The knives are of high-carbon crucible steel welded to a soft backing. A feature is the manner in which the vertical adjustment of the upper knife bar can be made, so as to retain the nominal cutting length of the shears regardless of the amount the knives are ground. A spring pull-down actuates automatically the movement of the knife bar and serves to clamp the sheets while the cut is being made. The gears are cut from solid castings. A Johnson clutch is furnished with the machine shown and is lubricated internally by grease. All of the bearing surfaces are lubricated thoroughly by means of oil cups. Large dustproof bearings are provided with convenient adjustment for wear. The bed of the machine is designed so as to obtain a quick change of the bed knife in a standing position. Front, back and side gages are furnished. The machine illustrated weighs approximately 2,000 lb. and has a normal cutting length of 52 in.



Electric Heater

RAILWAY UTILITY COMPANY
Chicago, Ill.

HEATING elements of a nickel-chromium ribbon embedded in a refractory material under hydraulic pressure of 100 tons per lineal foot are

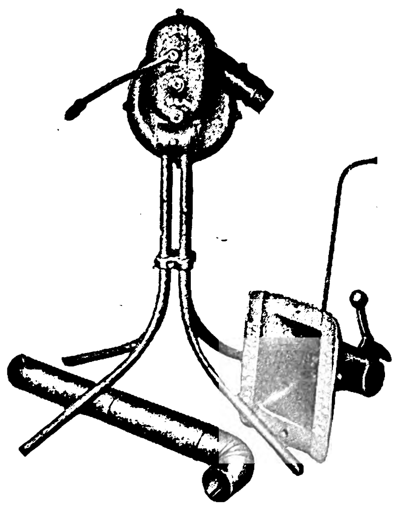


used in the heater shown. It is a two-unit horizontal type heater suitable for paint storage, oil rooms, drying and baking ovens. The embedded heating element is entirely closed in rust-resisting iron or when extreme conditions are to be met, in high temperature sheathing material, with no open ends or mica to break off and collect moisture. All units are fired in a furnace at a temperature of 1,500 deg. F. to vitrify the refractory material and to make it moisture-proof. Every unit is tested for insulation breakdown at 1,500 volts alternating current. Automatic control can be supplied with these heaters, if desired, but ordinarily the three heat switch is sufficient. The Chromalox strips are mounted in a black enameled perforated pressed steel case and are similar in appearance to those in electric heaters used for street car service. Separate Chromalox strips can be obtained for the heating of babbitting furnaces, glue pots, drying ovens, sand driers, etc. The mounting of these units is very simple. Holes are provided in the ends for fastening to a support made from steel angles or straps.

Silent Blower

BUFFALO FORGE COMPANY,
Buffalo, N. Y.

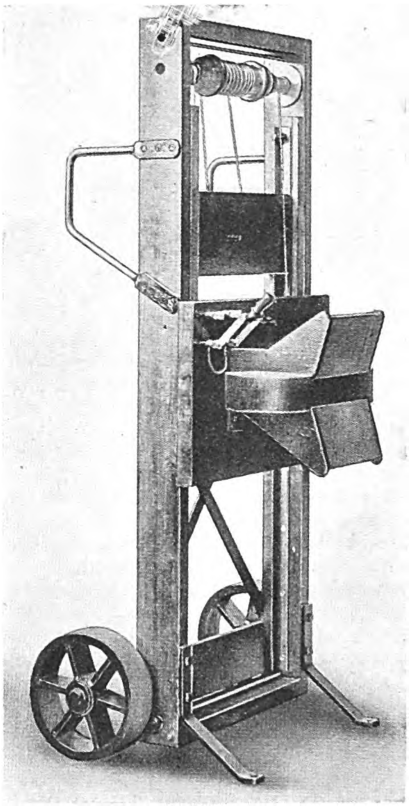
PERMANENT alignment of the gears of the Buffalo blower is assured by use of a one-piece cast iron gear case with removable cover. Frequent oiling also is unnecessary. The helical pinion on the fan shaft is a part of the steel shaft itself, making the part strong. The helical type of gear assumes almost noiseless operation. A simple adjustment on the end of the shaft provides the means for taking up wear on the main bearing. Adjustable bearings are used for the shaft end thrust. New Departure ball bearings are furnished throughout. The fan is of the volute type, made of cast iron in two pieces.



Armature Testing Equipment

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
East Pittsburgh, Pa.

PROVIDING a convenient method of testing railway armatures and one which will detect short circuits and grounds readily, the Westinghouse Electric & Manufacturing Company has placed on the market the armature testing outfit illustrated. This consists of a laminated iron core in which an alternating magnetic flux is set up by connecting the terminals of its exciting coil to a source of alternating current. The core is mounted on a wheeled stand which can be readily moved up to an armature being repaired and on which tests are to be made. The upright framework has a windlass for raising or lowering the crosshead which supports the laminated core so that the latter can be shoved against the armature as it rests on the usual type of rewinding stand.



When either a direct-current or an alternating-current wave-wound (two-circuit) armature is placed against the face of the laminated core, which is shaped to fit an armature, an alternating flux passes through the armature iron. If the armature winding is correct the electromotive forces generated counterbalance each other and no current passes through the winding. A short-circuited or reversed coil will allow a local current to flow, generating a flux around the slot in which the coil lies.

This testing equipment is suitable only for use with wave-wound (two-circuit) armatures, as the equalizing connections on lap or multiple-wound armatures make the entire winding appear to be short circuited.

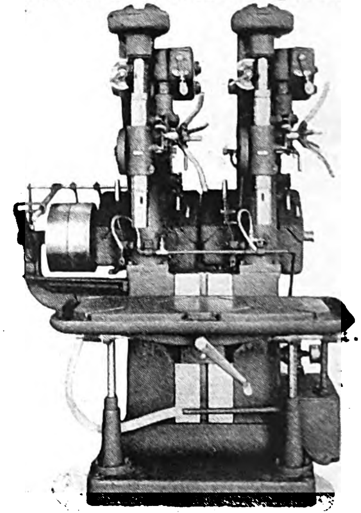
With the exciting coil energized, a piece of metal or a knife blade is passed around the commutator. This short circuits in succession each of the coils that have one side under the testing pole. If there are no faults in the winding a decided spark occurs as the knife blade leaves each of the bars. Absence of a spark between two bars indicates either a short circuit, an open circuit or a reversed coil in the winding.

A short-circuited or reversed coil will also have a local current induced in it which will generate a flux around the slot in which the coil lies. A local flux can be detected by moving a piece of sheet iron, held lightly, over the surface of the armature, so as to bridge from one tooth to the next successively. The local flux caused by a short circuit or reverse connection will attract the piece of iron when it bridges across the slot containing the defective coil. The sheet iron is thus made to vibrate. If no local flux is detected, the fault disclosed by the sparking test is due to an open circuit.

Two Spindle Box Column Gang Drill Press

BARNES DRILL COMPANY
814-830 Chestnut Street, Rockford, Ill.

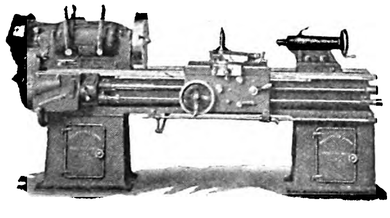
DRILLING and tapping can be done readily on the machine illustrated. All gears and their bearings are fully inclosed and are supplied automatically with a continuous flow of oil. There are eight geared speeds and eight geared feeds on each spindle, all of which can be operated independently of one another, and are under the instant control of the operator from the front of the machine. If desired, the gear thread leading feeds may be supplied with slip gears for different pitches for accurate tapping and threading. The transmission gears are cut from special chrome nickel steel, heat treated and tempered, giving high tensile strength. The machine will drive drills up to 1¾ in. through their working limits. If desired, a geared motor drive can be supplied. For the machine shown a 7½-hp. motor, 1,200 r.p.m., is recommended. For tapping, any and all spindles can be furnished with reversing friction clutch gears and automatic reversing mechanism. Spindles can be furnished with back gears, geared feed and automatic stop. This machine will drill a 1½-in. hole in steel at the rate of 3 in. per minute and in cast iron at the rate of 5 in. per minute.



Standard Geared Head Lathe

REED-PRENTICE CORPORATION
Worcester, Mass.

USE of an all-friction clutch headstock is said to make the geared head lathe shown very rapid in speed changing. The drive is direct from the main crankshaft or motor shaft, to a single pulley running on ball bearings. Start, stop and reverse of the spindle is obtained by a lever on the apron which operates a mechanism consisting of three bevel gears and a double friction clutch. The eight spindle speeds are selected by means of three levers on the front of the headstock. A quick-change gear box provides 44 rates of feed and 44 different threads of the most useful pitch. The spindle is made of high-grade steel with journals hardened and ground. Spindle bearings are made of high-grade bronze and are provided with an effective oiling system.

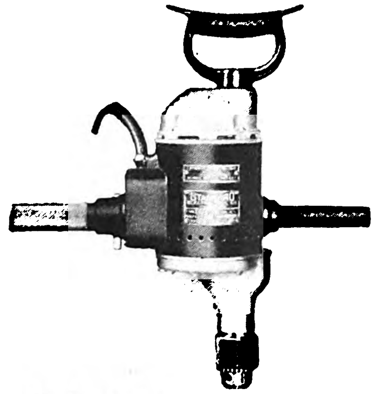


A carriage with rigid and wide bridge and of heavy design is furnished. An apron with a double support is rigidly bolted to the carriage. Lateral adjustment for taper turning is a feature. The standard equipment of the machine consists of a steady rest, large and small face plates, compound rest, regular tool post, quick change gear mechanism, thread-chasing dial and all necessary wrenches.

Universal Electric Drilling Machine

STANDARD ELECTRIC TOOL COMPANY
1938-46 W. Eighth Street, Cincinnati, Ohio

BALL BEARING design and a special plunger type switch are features of this ½-in. electric drill. This machine is equipped with a Universal motor interchangeable for both a.c. and d.c. of the same voltage. It is fitted with a cord and plug, combination spade handle and breastplate as shown. A three-jaw geared chuck for straight shank drill bits up to ½ in. is also furnished. It is particularly convenient for car body work in electric railway shops where parts cannot be taken to a stationary drill press.



American Association News

Trolley Wire

MEMBERS of the joint committee on standardization of trolley wire met at association headquarters in New York on March 29 to continue the work on specifications for hard-drawn copper and bronze trolley wire.

There were present at this meeting H. J. Horn, W. R. Webster and C. D. Gray, representing the American Society for Testing Materials; W. H. Bassett, representing the A.S.T.M. and the A.E.R.E.A.; C. L. Hancock, J. W. Allen, H. S. Murphy, chairman, and G. C. Hecker, representing the A.E.R.E.A.

Practically the entire meeting was given over to a discussion of the bronze trolley wire specification, considering in detail the requirements for tensile strength and elongation and for the twist test. A number of suggestions were made for compromises on the requirements under discussion and several of these were favorably received. It is proposed to submit these suggestions to proper sub-committees of the two interested associations to obtain further discussion and a decision.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 20-22—**American Society of Civil Engineers, spring meeting, Kenilworth Inn, Asheville, N. C.**

April 26-29—**Southwestern Public Service Association, convention, New Orleans, La.**

April 27-29—**American Welding Society, eighth annual meeting, Engineering Societies Building, New York City.**

May 3-5—**United States Chamber of Commerce, annual meeting, Washington, D. C.**

May 6—**American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

May 9—**National Conference on City Planning, Washington, D. C.**

May 31—June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen Denmark.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-30—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.**

Traffic and Safety

CLASSIFICATION of accidents was discussed at a meeting of the joint committee on traffic and safety held at Pittsburgh, Pa., April 7. It was the opinion that the classification adopted by the association in 1926 after several years discussion and consideration was so drawn up as to be applicable to any company and could be modified to meet its individual requirements. The only improvement deemed desirable in that classification was some slight simplification. To accomplish this result it was recommended that items 7, 9 and 10 be combined into one item, boarding and alighting accidents. The question of further classification of accidents into the two divisions chargeable and non-chargeable was brought up. It was the general opinion that this would be a very difficult division to make. It was felt that the committee could not, this year, bring about any change in the classification of accidents, but that it should be brought before the convention with the idea that it might be changed next year or the one following.

In order that the general opinion of the industry might be determined as to this it was decided to appoint a sub-committee to draft a questionnaire including two questions relating to changes of classification of accidents and chargeable and non-chargeable accidents, the questionnaire to be sent out by association headquarters. S. W. Baldwin, E. J. Paige and R. W. Emerson were asked to draw up this draft and forward it to the executive secretary.

At the meeting held in New York in January a letter was read from W. H. Boyce asking that ideas for safety posters be submitted to Labert St. Clair. Six sketches were brought in by Mr. Emerson. With slight modifications they were approved. Mr. Emerson suggested that furnishing of such posters is more a function of the National Safety Council and that if the association undertakes such work it would probably be a duplication, even though a small proportion of the street railway companies in the United States are members of the council. However, he stated that at the meeting of the council executive committee to be held in the near future he would bring up the question of the purchase of posters by non-members of the council.

Further, in the matter of a study of traffic surveys of a number of cities C. H. Evenson reported that he had received reports from Atlanta, Washington, Baltimore, St. Louis, Chicago and Detroit and had had a summary made of them. He further suggested that a sub-committee make a further study of this summary, submitting a report to all the members of the committee for study before the next general committee meeting. All members present concurring, Mr. Emerson, Mr. Paige and Mr. Evenson will act as this sub-committee. Mr. Evenson suggested that a point which should be stressed in the report of the committee was that of urging street railway managers to initiate action looking toward traffic regulation, using the question of safety to the general public as the means of bringing this question before the authorities and the public at large.

Since it is desired to have all reports submitted to the executive committee of the association not later than July 1, it was suggested that a general meeting of the committee be held about June 1, the exact date to be fixed by the co-chairman, the meeting to be held in New York. Members present were C. H. Evenson, chairman; H. K. Bennett, co-chairman; A. J. Fink, R. W. Emerson, E. C. Spring, J. P. Ingle, J. A. Stoll, S. W. Baldwin, E. J. Paige, Samuel Riddle, sponsor, and W. H. Boyce, sponsor.

W. & S. Special Committee No. 4

CHAIRMAN BAKER of special way and structures committee No. 4 on track ballast and drainage of the Engineering Association called a meeting of his committee in Chicago on March 9 at which there were present C. L. Hawkins, J. H. Haylow, E. J. Archambault and S. Clay Baker.

The progress made by the committee was reviewed and discussed. It was finally agreed that a questionnaire should be sent out to obtain an up-to-date view on standard practice. This questionnaire will probably not go out to the entire membership but only to members of the way and structures committee.

Special Bulletins Available

Following is a list of special reports being prepared by the Bureau of Information and Service of the American Electric Railway Association:

Bulletin No. 133: Working Conditions of Electric Railway Trainmen. A tabulation showing the hours of labor, length and types of run, proportion of straight and swing runs, overtime rates, what constitutes overtime, extra compensation allowed for special types of work, labor turnover, etc., for over 250 operating companies.

Bulletin No. 134: Working Conditions of Bus Operators. This bulletin gives for bus operators substantially the same information as is given in Bulletin No. 133 for trainmen—namely, hours of labor, length and types of run, proportion of straight and swing runs, overtime rates, etc. This is the first bulletin which the association has ever prepared on the working conditions of bus men and includes information for 112 bus operations.

Bulletin No. 135: One-Man Car Operation. A new compilation of one-man car data containing a complete list of electric railways now operating one-man cars, showing the number of cars operated by each company, record and summary of all cases in which the legality or propriety of operating one-man cars has been attacked, statements of opinion by public regulatory bodies as to the merits of the one-man car. It also gives a comparison of the results of operation of one-man and two-man cars, including the comparative accident record of each. This bulletin brings up to date and supersedes the data contained in Bulletin No. 95: "Recent Developments in One-Man Car Operation."

Bulletin No. 136: Electric Railways Operating Motor Bus Lines. A new, revised list of more than 350 electric railways now operating motor buses, showing for each company the number of miles of bus route, number, type and seating capacity of buses, fare charged and transfer privileges to railway lines.

In addition to the above the following supplements have been prepared:

Supplement No. 19 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 1 to Bulletin No. 129: Wages of Trainmen.

Supplement No. 1 to Bulletin No. 130: Wages of Bus Men.

Cost of Living Studies (Bulletin No. 137).

Sub-Committee on Depreciation

ACTION to be taken by the American Electric Railway Association in connection with the forthcoming hearing on depreciation before the Interstate Commerce Commission on May 23 was discussed at a meeting of the sub-committee on depreciation held in Chicago on April 6 and 7. Those present at the meeting included the following: R. R. Bradley, Chicago; Thomas Conway, Jr., Philadelphia; J. H. Hanna, Washington, D. C.; Frank Karr, Los Angeles; L. R. Nash, Boston; J. A. Knowlton, Springfield, Ill.; B. E. Bramble, Chicago; F. W. Doolittle, New York; Richard Sachse, Los Angeles; S. M. Haskins, Los Angeles; W. H. Sawyer, East St. Louis, Ill.; R. S. Torgerson, Chicago; C. H. Allen, Chicago; A. W. Brady, Anderson, Ind.; Leo Loeb, New York; H. M. Sowle, New York; Charles Gordon, New York; F. A. Newton, New York; F. E. Stout, Chicago; C. D. Jackson, New York; P. J. Lucey, Chicago; B. W. Warren, Boston; C. L. S. Tingley, Philadelphia; C. E. Thompson, Chicago; A. S. Richey, Worcester, Mass.; B. F. Weadock, New York; Harry Reid, New York; L. S. Storrs, New York; C. D. Cass, Waterloo, Iowa.

One outstanding problem before the committee is the collection of the information necessary to show what would actually be the result of a depreciation order for electric railways by the Interstate Commerce Commission similar to that issued for steam railroads. Since the compilation of this data may prove difficult to some properties, a selected list of companies which are typical of various classes are to be specially urged to co-operate in supplying the needed information.

In general, the committee agreed that the retroactive feature of the steam road depreciation order and the arbitrary requirement of setting up a fixed reserve for depreciation each month regardless of business conditions would be particularly harmful to the electric railway industry. In representing the industry before the commission it is the intention of the committee to speak for the association, without waiving the right of individual properties to present their own cases. It was the expressed hope of the committee, however, that properties which expect to present their own cases during the hearing will notify the committee of their intention. Because of the short time available before the date set for the hearing a subcommittee consisting of Chairman J. H. Hanna, R. R. Bradley, Thomas Conway, Jr., and L. S. Storrs was appointed to seek a postponment of the hearing date from the commission.

News of Other Associations

Mr. Johnson Discusses Transportation

SPEAKING before the Birney Club of St. Louis on April 4 H. A. Johnson, general manager Chicago Rapid Transit Company, said that transportation needs of the country although greater than ever before are being met more adequately than they have ever been since our early ancestors discovered the wheel as a method of transport, and expressed as the greatest need of the hour a more complete co-ordination of transportation agencies so that wasteful duplication of service may be eliminated; so that the steam railroad, the electric railway and the motor bus are each put to the use for which it is best adapted, both from standpoint of service to the public and economical operation.

We are only on the threshold of a properly co-ordinated system of transportation but we are making progress. There is a general tendency to absorption of small and unreliable transportation companies incapable of rendering good service by large and responsible companies. The task of co-ordinating our transportation agencies is one of such magnitude that it will require time and infinite work to bring it about, but it will be done and it rests with those whose life work is transportation to do it.

We are making progress in use of the motor coach. In 1921 there were only 21 electric railway companies operating 73 motor coaches with 35 miles of route; whereas in September, 1926, they operated 6,469 coaches over 14,907 miles of route. This increase is at a rate much faster than that at which independent lines have grown.

Mr. Johnson also said that it is significant that traffic in American cities in general is increasing more rapidly in the suburbs than in the city itself and that in every large city the commuting zone was extended with every improvement in transportation service. The only limit which the city worker recognizes in the distance between his home and his place of work is the time consumed in his daily travel.

Mr. Johnson, who has given considerable study to transportation problems both here and abroad, said that one of the greatest problems to be met in the development of comprehensive transportation plans for cities was the difficulty of getting enabling legislation, because the attitude of the average man toward some new proposal which he does not completely understand is usually to vote "no."

The News of the Industry

New St. Louis Petition Provides for Flat Eight-Cent Fare

Receiver Rolla Wells of the United Railways, St. Louis, Mo., filed a petition on April 9 with the Missouri Public Service Commission at Jefferson City asking again for an increase in rates. The latest request is for a flat fare of 8 cents. The increase is on the basis of an estimated $75,000,000 valuation for the properties. A former application, pending before the commission for many months, sought a fare of 8 cents or two tokens for 15 cents. The company was able to charge that fare base between Feb. 7 and Feb. 28 under the protection of a temporary restraining order issued by the federal court.

In the new petition it is set forth that during the brief period in which the higher rate of fare was in effect the company collected $48,420 more than for a similar period in 1926. The petition further recites that the original request for higher fares filed with the commission on June 4, 1926, was based on a physical valuation of the road's properties of $51,781,348. The petition said:

> The fare prayed for in the application filed June 4, 1926, would not, in the light of experience with that rate of fare and in view of the fact that the number of revenue passengers has been steadily falling off during the three months of 1927, produce sufficient revenue to pay operating costs, taxes and depreciation and yield a fair return on the present value of the property devoted to public use.
>
> An increase in the rate of adult fare to 8 cents cash and two for 15 cents would yield only about $870,000 additional revenue annually, which would represent a net income available for returns of only $75,000,000, and only 5.77 per cent on the Public Service Commission's 1919 valuation plus additions and betterments.
>
> To provide sufficient revenue to yield at least a part of a fair return on the present value of the property it will be necessary to increase the adult fares to 8 cents, which will, in the opinion of the petitioners, predicated upon the experience of 7½-cent fares, produce no more than $2,000,000 additional revenue during the year of 1927, compared with 1926, and represent an annual return of only 6 per cent on the present value of the properties and less than 8 per cent on the commission's 1919 valuation.

An audit completed recently by the Missouri Public Service Commission disclosed that the railway suffered a net loss of $225,000 during 1925 and the first ten months of 1926. The commission will hear the company's petition on April 22.

Injunction Action by Duluth Street Railway Upheld

In a decision by Justice Holmes the United States Supreme Court April 11 affirmed the ruling of the lower court which had granted an injunction to the Duluth Street Railway, Duluth, Minn., in a fare controversy with the Railroad and Warehouse Commission of Minnesota.

The railway applied for higher fares and the state commission fixed its value for rate-making purposes, but entered an order that instead of granting permission to charge a straight 6-cent fare, as the company had sought, it might charge a 6-cent cash fare but should sell five tokens for 25 cents. The company immediately secured an injunction in the federal court.

The state commission appealed to the United States Supreme Court, on the ground, among others, that the procedure followed by the railway was erroneous in that the Minnesota State law provides a method of appeal from decisions of the Railroad and Warehouse Commission and that this remedy had not been exhausted, therefore the company could not rightfully apply to the federal courts for relief. The commission also pleaded that the action of the company was premature in that it sought an injunction before testing out the rates ordered by the commission.

The Supreme Court holds that the company had a right to choose the court to which it would appeal for relief and therefore that its action in asking an injunction of the federal district court was proper. The high court did not discuss the question of whether the suit was premature, and it permits the decision of the district court in enjoining the rates fixed by the state commission to stand.

Few Indiana Utility Measures Become Law

Following adjournment of the Indiana Legislature and the signing by the Governor of bills he favors, only three bills pertaining directly to public utilities and how they shall be regulated succeeded in becoming laws.

Senate bill No. 178 gives any one the right to appeal to circuit or superior court from any ruling of the Indiana Public Service Commission. The appeal shall be taken thirty days after the ruling is made.

Senate bill No. 171 amends the public service commission act of 1913 by adding a provision that, if the commission finds, on inquiry, that salaries paid by utilities are excessive or that more persons are employed than necessary, or that any unjustified expense is being incurred, the commission shall designate such items and not take them into account in fixing rates.

Senate bill No. 124 amends the utilities act of 1915 by omitting from it the proviso which required a report to be made to the Public Service Commission and its approval obtained before the earnings of a municipal plant that had accumulated a sinking fund sufficient to pay its debt could be turned into the general fund.

A joint resolution was passed requesting the Congress to enact legislation denying jurisdiction to federal courts to hear utility rate cases until the legal remedies offered by the state courts are exhausted.

Columbia Carries On Without Car Service

Operation of street cars in Columbia, S. C., suspended on March 11, has not yet been resumed. The matter of suspension of service may find its way into the courts of the state. On petition of a citizen, the South Carolina Railroad Commission ordered the Columbia Railway, Gas & Electric Company to show cause why it had suspended operation without permission. The railway failed to show cause, whereupon the commission ordered it to resume operations within a stipulated time or else pay a fine. Then the company filed an appeal for further hearing before the commission, this appeal serving to stay the execution of the "pay a fine or resume service" order, and at the same time asked that it be permitted to discontinue the service permanently.

The Railroad Commission, giving as its opinion that "the unregulated unrestricted system of 'jitney' transportation has utterly destroyed the railway system in Columbia," handed down an order permitting permanent discontinuance of service and at the same time revoked the order to pay a fine or resume service. Now the question has arisen of the right of the commission to grant permission to suspend service and the matter may get into the courts on that angle. As is shown by the order, the 10-cent "jitneys" continue to be a most disturbing factor in the transportation problems of the city. They offer keen competition to buses operated on a regular schedule and over a definite route. The jitneys, operated without route or schedule, carry passengers at the same rate as the buses and take them direct to their door or office.

Another Move by City in Rochester Railway Valuation

The long-pending suit of the city of Rochester for a new valuation of the lines of the New York State Railways in Rochester came to the fore again with announcement by Corporation Counsel Platt that, on behalf of the city, he would ask court permission to inspect the books of the railway under which the valuation under the service-at-cost contract was fixed.

The move is considered preliminary to establishing whether the appraisers fixed the valuation according to regular procedure. The railway has denied the city the right to inspect its books and a court order is now sought. When the case will actually come to trial is still uncertain. The litigation, in which the city is striving to obtain a lower valuation for the service-at-cost contract in the hope of gaining a fare reduction, has been hanging fire three years.

One-Man Car Bill Killed in Pennsylvania

Legislation against the one-man car in Pennsylvania is dead for this session. The House has killed the one-man car bill. There was very little public support for the bill and the wonder was that the measure got as far as it did. Newspaper comment, particularly in Philadelphia and Pittsburgh, was decidedly against the measure. The extent of the appreciation by the newspapers of the value of the one-man car was, perhaps, nowhere better expressed than by the Pittsburgh *Gazette-Times*. That paper said:

> Substantial improvement of electric railway service in populous places and reduction of the rates of fare apparently depend entirely on lowering the costs of transportation. The one-man car is less expensive to operate than the two-man car. A greater number of cars on a route without increase of the wage account is possible where the newer system is in use. This opens up a prospect not unpleasing to car riders.

Franchise Acceptance Formalities Being Concluded in Kansas City

The Kansas City Public Service Company, Kansas City, Mo., during the week ended April 2, completed its formal acceptance of the terms of the new railway franchise awarded to it by the city officials on March 21. The form of the acceptance document was approved by the City Council, and it was mailed to Chicago on March 21 to the First Trust & Savings Bank, corporate trustees under the new mortgage on the local properties.

Under the provisions of the franchise ordinance as passed, the public service company had twenty days in which to accept or reject the franchise. The acceptance now awaits only the signature of William G. Woolfolk, president of the Kansas City Public Service Company, before being filed with the City Council. The ordinance, according to Powell C. Groner, chief counsel for the company, would become effective on April 10. The new fare schedule will then be filed with the State Public Service Commission as required by law. It is pointed out, however, that the commission has ruled that the new fare schedules will not become effective until 30 days after approval by commission, unless good reason is shown for putting them into effect earlier.

Six Cents and Other Requests Asked in London

A 6-cent fare with five tickets for a quarter for a period of two years is requested by the London Street Railway, London, Ont. This petition is part of a proposal to the city which states that at the end of the two-year period the railway would arrange to revise the fares as necessity might dictate with leave to appeal to the Ontario Railway & Municipal Board by either party.

The proposals include an exclusive perpetual franchise with all controversial clauses, including the use of one-man cars, to be referable to the board. The company agrees to pay the cost of track foundations but believes the city should assume obligations for surface paving. A clause provides for the purchase of the railway and bus lines by the city on six months notice, the value of the system to be decided by arbitration. The company also seeks exemption from all taxation except the school tax. If an agreement is reached the company will spend $300,000 within five years on general improvements.

The temporary agreement which authorized the London Street Railway to charge a 5-cent fare expired on April 1. The railway is now really operating under the old agreement whereby it is compelled to sell seven unlimited and nine limited tickets for a quarter.

Investigation of International Accounts

William R. Pooley of the New York Public Service Commission has reserved decision on the application of the municipal authorities of Buffalo, N. Y., for permission to examine the books of the International Railway, for certain figures to be used in opposition to the company's request for a 10-cent fare in Buffalo. Henry W. Killeen, of counsel for the International, says the application is a mere device for delaying the proceedings or for seeking information to be used in the United States District Court litigation.

Testifying before the commission, John J. Schmunk, vice-president of Mitten Management, Inc., in charge of accounts, said that the amount of half-fares collected is far below the amount estimated by the commission's experts when fixing the 8-cent fare which now is in effect in Buffalo.

Dr. Milo R. Maltbie, acting for the city, will oppose the 10-cent fare request of the International.

Electrification and Allied Projects Cost $55,500,000

Beautification of Chicago's downtown lake front through electrification of its suburban divisions, lowering of track levels in Grant Park, erection of a new suburban terminal at Randolph Street, and completion of the vast Markham freight yards on the south side of the city and similar undertakings in the last six years, represents a total investment by the Illinois Central Railroad to date of more than $55,500,000, according to a recent statement by L. A. Downs, president. During the current year, he said, an additional $4,600,000 will be spent in continuance of this work. Electric operation of all Illinois Central suburban trains in Chicago was begun last August in compliance with the terms of an ordinance for the development of the city's lake front.

Plans for the construction of another monumental new Union station by the Illinois Central on the site of the present Central station at Roosevelt Road and Michigan Avenue, have been retarded by the lack of definite decision as to terminal building by other railroads entering the city from the south. The Illinois Central hopes to induce the lines now using the Dearborn, La Salle and Grand Central terminals to join with it in the centralized terminal project to cost about $20,000,000.

Fearful of Future Fares in San Francisco

A controversy has arisen over the effect on fares of a proposed bond issue election early next year for extensions of the Municipal Railway, San Francisco. One faction declares that an 8-cent fare, superseding the present 5-cent rate, will be the ultimate outcome. City officials deny this indignantly.

Adolph Uhl, manager of the City Efficiency League, declared that the extensions under the proposed $3,500,000 bond issue will produce only $444,000 revenue a year, and that there will be a total deficit of $393,000 on the lines before the bond redemption is added, and that when this redemption is finally added the deficit will total $520,000 a year.

"This means an 8-cent fare," was Mr. Uhl's deduction.

Nelson Eckart, assistant city engineer, retorted in this fashion:

> Including bond redemption the first year is ridiculous. As every one knows, bond redemption doesn't begin until the fifth year. To say that the line into the Sunset district will produce only $130,000 yearly is also ridiculous. The B line into Richmond district, which is comparable to the Sunset line, took in $308,000 in 1915, its first year, and $520,000 last year.
>
> The Sunset line will not only take in considerably more than $130,000 the first year, but its receipts will increase even faster than those of the B line did.
>
> If San Francisco is to grow it must have transportation. The railroad bond issue will give transportation to districts which are partially built and which need only transportation to become densely settled.
>
> But even if the lines proposed all lost money the first year they would be worth building.

In addition to extensions on five lines it is proposed to erect a car repair shop and a garage. Purchase of twenty buses for use in the Sunset and Potrero sections also is recommended.

The recommendations involve the building of 11.54 miles of track at a cost of $1,382,000, acquisition of 47 new cars at a cost of $799,000, purchase of $150,000 worth of buses and expenditure of $1,660,000 for land and auxiliary establishments.

The city engineer recommends that no further extensions be approved until 1929, when franchises for 126 miles of track of the Market Street and California Street Railway systems expire.

St. Louis Expert Will Report on New York Subways

Charles Edward Smith, St. Louis, Mo., has been engaged by the city of New York to study the subway lines and the possible consolidation of them with the existing rapid transit systems. He is now in New York City to remain four or five months. Mr. Smith, who is well known in the West as engineering counsel to public utilities, is head of a firm of consulting engineers, with offices in St. Louis, and for some time has been conducting a survey on the development of the rapid transit system for that city. He has had wide experience in railroad construction, in municipal developments and in government service. His appointment was authorized by the Board of Estimate and Apportionment a month ago. An appropriation of $25,000 was made in connection with the appointment.

Fare Issues

Dr. Delox F. Wilcox, traction expert, has been assisting the city of Los Angeles, Cal., in opposing higher fares for the Los Angeles Railway. The City Council authorized his services on March 28. The increase sought by the Los Angeles Railway is from 5 to 7 cents. The city is scheduled to start presentation of its case on May 17 before the State Railroad Commission.

Meanwhile the Pacific Electric Railway fare case is again before the Railroad Commission following a hearing on April 5. A compromise was effected recently between attorneys representing the Pacific Electric Railway and Los Angeles and the neighboring cities whereby Glendale and Burbank will accept a temporary schedule of reduced single and round-trip fares and a 20 per cent increase in the price of commutation books. The Pacific Electric Railway is seeking a 7-cent local fare and a 20 per cent increase in the interurban rate. Supplemental to its application for a fare increase the railway filed an amended petition which sought as an experimental measure a general reduction in all interurban rates. This petition was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 19, page 548.

Chattanooga Commission Receives Transit Plan

A transit plan prepared for the city of Chattanooga, Tenn., which would mean a considerable expenditure for the Tennessee Electric Power Company was passed recently to the City Commission. The plan was prepared by Harland Bartholomew, expert city planner.

B. C. Edgar, vice-president and general manager of the Tennessee Electric Power Company, said that his company would not approve the plan at the present time. One section, he explained, dealt with the proposed changes in present railway routes and the other with additional lines for the future development of the system. The report recommended the removal of all tracks from Broad to Chestnut Streets. This, Mr. Edgar declared, would not be satisfactory with the present width of Chestnut, but might later if the street were widened. He further called attention to a recommendation favoring removal of all tracks from the Walnut Street bridge. This change would not be favored by the company, he said, because it would entail a lot of expense and would not accomplish any improvement. In his opinion the recommendations in Mr. Bartholomew's plan would call for the expenditure of $1,662,000.

Confer on New Jersey Canal Bed

The desire of the Public Service Railway, Newark, N. J., to take over and operate the abandoned bed of the Morris Canal for rapid transit lines was expressed again by Thomas N. McCarter, president of the road, at the first of a series of conferences between representatives of the city and the Public Service Railway on the proposed use of this canal bed. Other conferees were John L. O'Toole, vice-president in charge of public relations; Corporation Counsel Congleton, acting director of the department of public affairs, and Chief Engineer Costello. If equitable terms can be worked out, Public Service will consider financing the subway construction. The company would prefer to operate the bed as an open-cut subway from Plane Street northwest to the city line, as originally proposed, the section from Plane Street to the new Pennsylvania Railroad to be covered. Mr. McCarter said, however, the corporation will be ready to go along on plans for covering the canal bed at other points if found advisable.

Worm-Drive Car Successful at Springfield, Mass., Test

New Unit There Operates Successfully in Trial Run Attended by Railway Men, Manufacturers and Others—Car Noiseless and Remarkably Smooth

IN THE presence of visiting railway executives, manufacturer's representatives, city and state officials and newspaper men, the experimental worm-drive car built for the Springfield Street Railway, Springfield, Mass., by the Wason Manufacturing Company was thoroughly tested on April 14 under various track conditions.

The car, described in detail in the ELECTRIC RAILWAY JOURNAL for March 26, exceeded in several respects the expectations of its designers. Construction was completed only a few hours before the demonstration run, but the unit operated perfectly in all of its details. Members of the American Electric Railway Engineering Association committee on noise reduction, headed by Chairman H. S. Williams, were present to ride the car during its demonstration run. Mr. Williams planned to make a series of noise tests of the new car in comparison with standard cars on the property.

CAR PERFORMS WELL IN SERVICE

The Timken worm-drive axles gave smooth and rapid acceleration. The Westinghouse motors, mounted longitudinally in the truck frame and driving the axles through Spicer universal joints and a short drive shaft, operated smoothly and handled grades and curves successfully. A remarkable smoothness and quietness around curves was attributable to the differential drive in the axles. Reduction of unsprung weight by mounting the motors in the truck frame instead of on the axles eliminated pounding over special work and reduced the usual shock and vibration of ordinary operation over special work to a mere metallic click. The electrically controlled automotive type brakes with diaphragms mounted on the axles and with internal expanding shoes inside brake drums bolted to the wheels made possible such high rates of deceleration that it is anticipated the brake diaphragms will need to be made smaller to reduce the braking power. The automotive type hand brake was found ample to slide the wheels on dry rail.

Good riding qualities of the radical truck design proved to be one of the outstanding features of the demonstration. Noise of operation was limited to the hum produced by the wheel flanges in grooved rail, the trolley wheel and motor armatures. Gear noise was absent and brakes were entirely silent. It is expected that even greater quietness will be obtained by the use of rubber pads on the wheel webs.

All those who witnessed the demonstration declared that only a service test long enough to determine the strength and wearing features of the design is necessary before the car can be considered successful. After the finishing touches of trimming and painting are completed, work that is expected to take about ten days, the car will be placed in regular operation in Springfield.

Rapid Transit Operating Agreement Talk in Philadelphia

Thomas E. Mitten, chairman of the board of directors of the Philadelphia Rapid Transit Company, Philadelphia, Pa., is willing to enter into negotiations with the city for leasing the Frankford Elevated Railway and the Broad Street subway jointly.

This fact was made known by Mr. Mitten in a letter sent by him to Mayor Kendrick in reply to the Mayor's inquiry as to the best terms the P.R.T. could offer to the city for operation of the Frankford Elevated Railway after the expiration of the present lease.

Under the original Frankford L agreement, which was dated May 5, 1922, the term of the lease was fixed for five years, beginning Nov. 5, 1922, and expiring Nov. 4, 1927, with an option reserved to the city, but not to the company, to extend the term to July 1, 1957, by notifying the company to that effect not later than six months prior to the expiration of the five years term. That is, the city must notify the company of its intention by May 5, 1927, which is just about a month off. In order to decide what the city shall do in the matter Mayor Kendrick about a week ago wrote to Mr. Mitten, reminding him that May 5 is rapidly approaching, and requesting him to state the best terms under which the company would continue to operate the Frankford L in view of the fact that the proposed amended L lease had not received the approval of the commission.

There has been a decided opinion that the city should negotiate with the P.R.T. for an agreement that would embrace both the Frankford L and the Broad Street tube, which will soon be ready for operation. On the other hand, some persons are inclined to favor separate agreements for the two lines.

How One Manager of a Small City System Sees It

The Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y., carries 10,000 persons about the city daily, and suddenly to cast aside the railway and substitute buses would be disaster. This statement was made by George Wells, superintendent of the lines, who stressed the need of every up-to-date city keeping its railway lines and augmenting them wherever necessary with buses. He was answering an inquiry from one of the local newspapers. His comments on the changing aspects of transportation were especially pertinent. He said in part:

> When movies came, some people thought that actors would no longer be wanted. When victrolas were invented, many expected that singers and orchestras would not be in demand. When radios were invented, people asked if concert halls and public auditoriums were to be torn down.
>
> As a matter of fact, actors are wanted everywhere—likewise public speakers and orchestras and bands. Telephones have not superseded the telegraph.
>
> Since the advent of automobiles and buses, everyone is riding more. In the past year, more people traveled on steam roads, on trolley roads, in automobiles and buses than did the year before.
>
> Buses are a new and useful means of transportation and electric railways are adopting them. They do not take the place of electric railways in the majority of cases, but supplement them.
>
> Some electric railways have failed. Many bus lines have failed, and when railways have not paid it almost invariably follows that buses over the same routes do not pay unless the railway failed on account of poor management or tax burdens or both.
>
> A well-established and well-regulated railway is essential to any city of any consequence, and just because a few towns of lesser importance have allowed their railway systems to slip away from them, it should not follow that a modern, prosperous and promising city like Poughkeepsie should think of giving up its up-to-date, well-established and well-organized railway system and replace it with buses that are still in the experimental stage. Is any modern and self-respecting city allowing such a thing to happen? Not any, that I know of. Many are adding buses but not giving up their trolley system. Many cities are even paying the railways where they have failed, in order to keep them going. Many have canceled paying debts, taxes, etc., in order to help their trolley companies get on their feet again. They will not allow the railways to go. Those who have are regretting it.
>
> Electric railways are here to stay. They are beyond the experimental stage.
>
> Buses are here to stay, but they are still in the experimental stage.
>
> There are many failures of bus ventures all over the country, and it would be very unwise indiscriminately to abandon tracks for buses at this period of uncertainty.
>
> This company carries 10,000 passengers daily. It is a great responsibility, but the service seldom fails. The system has been built up through many years of practice and large expenditures of money. Suddenly to abandon this system for a form of transportation where many more vehicles would be required to do the same work might bring disaster upon the community.

Railway Issue in Oakland's Mayoralty Fight

Oakland, Cal., is in the midst of a lively spring election campaign. Frank Colbourn, one of the arbiters who two years ago awarded employees of the Key System Transit Corporation a higher wage scale, is running for Mayor. His opponent is J. L. Davie. One of the issues of the campaign is the 7-cent fare, which Mr. Colbourn is accused of having made imperative for the company in consequence of the expense saddled on it by the wage advance. It is a minor issue, though, and is not attracting much attention.

I DON'T WANT CUFFS ON 'EM
HEY, THESE TROUSERS BAG IN THE SEAT!

Clothes don't make the man, but they help

A Fitting Process

"Hey, those trousers bag in the seat!"

"Make those sleeves a little longer!"

"No, I don't want cuffs on those pants!"

These and similar expressions came from the office of J. Frank Johnson, vice-president and general manager of the Community Traction Company recently, arousing the curosity of car company visitors.

A peep inside the room disclosed a dozen men in various stages of dishabille, some of them with less of clothing than the greased challenger of the Catalina Island swim, but lacking the beautiful symmetry of this challenger.

Some were on chairs trying on trousers. Others were pulling and hauling at stubborn trouser legs from less advantageous places on the floor of the office. Others tried on vests and coats.

Paunches that demanded the utmost skill of expert tailors for proper fitting, shoulders round and shoulders square, victims of obesity and malnutrition—a gathering of sufficient variety in shape and size to drive the ordinary tailor woozy—all were there being fitted.

Outside several scores of other men waited, listening to the buzz of chatter that came from Vice-President Johnson's room.

The occasion was the fitting of Community Traction motormen, conductors and bus drivers with the new olive drab whipcord uniforms which have been ordered for them. Superintendent Emery had charge of the job.

"We want to have 'em all fitted out so they can appear as a unit in the new uniforms in a few days," said Mr. Emery, puffing vigorously and perspiring. "But at the present rate of speed we will have 'em all ready to make their bow to the public soon. I cannot give a definite date. It all depends on the outcome of this fitting process. But it will be either the 10th or the 15th of this month," he said.

The new uniforms have the new army roll collar. Hats to match also have been provided and heads of the several hundred motormen, conductors and bus drivers are furnishing another interesting phase of the outfitting process.—*Toledo Blade.*

Hartford Loses Tax Suit to Connecticut Company

The city of Hartford, Conn., has lost its suit against the Connecticut Company to collect a yearly tax of 2 per cent of the gross fares. The railway paid this 2 per cent tax from 1894 to 1923, and the total for the period amounted to $677,000. Judge Newell Jennings in his finding said that the tax was illegal. The ancient ruling of the City Council of Hartford reads in the records as follows:

> The directors shall pay into the city treasury each year 2 per cent of the annual gross receipts of fares as evidenced by such reports, until such time as the state law shall be so changed as to provide that taxes of street railways shall be paid locally instead of to the state, and in case of such change in the law, the company shall pay annually to the city any deficiency in the amount of the said taxes from the amount of the said 2 per cent on the receipts of the aforesaid.

The counsel for the railway contended that the levy was a tax and therefore illegal. The city contended the payments annually were for the privilege of electrifying lines in 1894 under the Tucker grant. To support the railway Judge Jennings stated: "I find as a fact, upon all evidence, that this levy was and is a tax."

Important New Subway Station Opened in New York

The New York Transit Commission, the Queensboro Chamber of Commerce and several civic organizations arranged an elaborate program to celebrate the opening of the Seventh Avenue (Times Square) station of the Queensboro subway on March 14. The new station, in conjunction with the Interborough Seventh Avenue line and the Times Square-Grand Central station shuttle line of the Interborough, consists of four levels. It is one of the most commodious subway stations in the world and will relieve the present congestion at Grand Central, where the former terminus of the Queensboro line is located. There is a Queensboro station at Fifth Avenue and 42d Street, but because of traffic conditions most of the passengers who use the Queensboro line board and leave trains at Grand Central. A considerable portion of this traffic transfers from the Seventh Avenue line of the Interborough and reaches Grand Central by shuttle. All of this traffic will be handled in the new four-level station at Seventh Avenue and 41st Street.

The entire extension of the Queensboro subway from Grand Central Station westward under 42d Street, to the rear of the Public Library, thence under 41st Street and west to Eighth Avenue, with the Seventh Avenue connection with the west side subway of the I.R.T., was constructed by the Powers-Kennedy Contracting Corporation. The contract price for the entire extension was $3,867,138. Of this, approximately $1,500,000 has been expended for the section from Fifth Avenue to Eighth Avenue, including the cost of the station and its equipment. Immediately after the exercises the Interborough put in effect a regular schedule, approved by the Transit Commission.

$300,000 Improvement Program for Beaver Valley

Probably in no other section does the paving question have so many ramifications as in the Beaver Valley, where the management of the Beaver Valley Traction Company, New Brighton, Pa., must deal with the official body of some 26 incorporated boroughs or towns, varying in size from 700 to 18,000 population and each one urging its particular program of street improvement, which invariably involves a portion of the lines. Here, as elsewhere, the company seeks relief from the paving burden which belongs to the horse car days when Dobbin did the damage. This is realized by many of the officials in the various towns and the many other favorable factors in the company's public relationship are rapidly breaking down all prejudice and the management sees, in the very near future, the elimination of the paving burden. In fact, a suitable contract, superseding a most unfavorable one, has already been made with one of the largest towns in the district.

In view of the possibility of being totally relieved of this burden a program for the rehabilitation of equipment and track has been devised. The purchase of six new cars leads the list. This will be followed with the rebuilding of several miles of track, replacing portions which were not kept up in the years past when dollars were scarce and revenues unequal to the equipment, labor and paving charges.

The change of public sentiment is perhaps best indicated by the fact that the company now has 15 miles of track on paved streets on which it has been relieved of all paving requirements.

In Ambridge, a town of 17,000 population, the street over which the lines are operated was improved. At the same time the company laid new track. This was under a franchise requiring that the town pay the cost of the paving and maintain it. The company is then to pay, if earned, a rental of $1,200 a year, after operating expenses, taxes and interest on bonded indebtedness have been deducted from revenues.

Approximately $300,000 is to be spent on the improvements to be made.

News Notes

Brooklyn "L" Removal Bill Signed.—Governor Smith of New York has signed the Hearn bill as chapter 374 of the laws of 1927 authorizing the city of New York to acquire by condemnation the right to remove the elevated railroad structure from Fulton Street and other streets and avenues in the Borough of Brooklyn and to assess the cost and expense thereof upon property benefited thereby.

Will Make Survey of Other Lines.—An inspection tour of electric railways in the principal cities of the country is being made by eight men experienced in railway operation under the direction of J. M. Loftis, superintendent of transportation, and A. J. Fink, superintendent of traffic and schedules of the Pittsburgh Railways, Pittsburgh, Pa. By this study of other systems the Pittsburgh Railways expects to discover improvements and advances in transportation that can be adjusted to its own lines.

Transportation Plan Under Consideration.—Mayor Frank X. Schwab of Buffalo has asked members of the City Council to consider plans for a transportation policy in anticipation of the opening of the new Peace bridge, which spans the Niagara River between Buffalo and Fort Erie, Canada. The Mayor recommended a municipal bus line from the retail shopping zone of the city to the American approach of the new bridge, to be opened early this summer.

Rate-Fixing Bill Killed.—The Minnesota Legislature in St. Paul has killed in committee of general legislation a bill to fix 6 per cent as legal rate of earnings for electric railways. The rate fixed by the Railroad and Warehouse Commission is 7½ per cent. The bill was sponsored by Representative Frank Starkey, St. Paul, and was designed to amend the Brooks-Coleman act, which placed the rate fixing power with the commission.

New Route Book in Los Angeles.—A new booklet entitled "Seeing Los Angeles by Yellow Car and Bus" has been published by the Los Angeles Railway, Los Angeles, Cal. This booklet contains information on places of interest in Los Angeles and how to reach them by street car or bus. It also contains schedules of owl car service on the various lines. Copies of these booklets are being distributed among the divisions for the use of conductors.

Would Increase Token Rate. — The Illinois Power & Light Corporation has applied to the Illinois Commerce Commission for authority to change its fares in Peoria, Ill., from seven tokens for 50 cents to three tokens for 25 cents, with a continuation of the present 10-cent cash fare. The nickel permit fare will be dropped under the new schedule. The company says that since the present schedule, put in force in 1922, it has failed by $200,000 annually to meet a fair return on its investment.

Intercompany Transfers Issued. — Issue of 1-cent transfers between cars of the Capital Traction and the Washington Railway & Electric Companies at New Jersey and New York Avenue in Washington, D. C., was authorized on April 7 by the Public Utilities Commission. The intercompany transfers will be issued, however, only by northbound cars on New Jersey Avenue to eastbound cars on New York Avenue and by westbound cars on New York Avenue to southbound cars on New Jersey Avenue.

One Mayor Expresses Views on Paving Ruling.—At a meeting of city officials of the state of New York to be held at Niagara Falls on May 31 legislation to relieve electric railways of any of their tax burdens will be discussed. The railways seek to amend the paving law to require them to pave only 8 in. on each side of a rail instead of paying for the pavement between the rails and 2 ft. outside. Mayor Clarence J. Cook of Binghamton, N. Y., is quoted as saying he believed that taxes paid by the electric railways were low enough and that the paving imposition might be considered as part of rental.

Ten Cents in Port Chester.—The fare on the new bus line of the County Transportation Company, Inc., within the village of Port Chester, N. Y., is 10 cents. Books containing twenty tickets each will be sold for $1 to pupils under eighteen years of age attending public or private schools having similar grades. Free transfers are given between the bus lines as well as to cars of the New York & Stamford Railway. The order became effective on April 3.

Rebus Contest in Grand Rapids.—Still further to stimulate riding and to familiarize the people with the names of its new electric rail coaches and other cars, the Grand Rapids Railway, Grand Rapids, Mich., has put on a rebus contest, with $100 in cash prizes, 25 special prizes—74 prizes in all. *Trolley Topics*, published monthly by the Grand Rapids Railway, explains the terms of the contest, which began on April 1 and ends on April 30. Of the 76 electric rail coaches and street cars with names in Grand Rapids, 27 are represented in the rebus sketches which the railway presents in the form of a contest open to everybody except employees. All are urged to familiarize themselves with the street car names, study the sketches and solve the puzzles. Answers will be judged by a committee and correct answers and names will be announced as soon as possible after April 30.

Commission Without Right to Order Extension.—The Fresno Traction Company, Fresno, Cal., has never dedicated its property to the service of the "Fink-Smith" district of that city. This was the ruling of the California Railroad Commission on April 5. The commission also held that it was without jurisdiction to direct the company to make the desired extension under the previous ruling of the California Supreme Court in the suit of the Hollywood Chamber of Commerce. This ruling compelled the commission to order a railway to construct an extension of its line. The city of Fresno filed a complaint with the Railroad Commission against the Fresno Traction Company and asked the commission to require that company to extend its tracks into the so-called "Fink-Smith" district.

Traction Line Hauls Large Quantities of Coal.—In spite of the strike of the union coal miners in the southern Indiana field, the Evansville & Ohio Valley Traction Company and the Evansville, Suburban & Newburgh Traction Company, the last named company operating from Evansville to Boonville and Evansville, are hauling a large amount of coal. The non-union coal mines in the southern Indiana fields are being operated steadily and as a result the electric railways are taxed to capacity to haul the coal into Evansville, from which city it is shipped to other markets. The wagon mines also are being operated and coal from many of these mines is hauled several miles in wagon to the nearest switch on the Evansville, Suburban & Newburgh line. It seems likely that most of the coal mines in the "pocket" will be operated to capacity all summer.

Recent Bus Developments

Bus Law in Lansing Upheld

The city ordinance of Lansing, Mich., prescribing routes for interurban and suburban buses was upheld by the State Supreme Court on April 1 in deciding the case carried up by the Highway Motor Bus Company and other bus lines operating in the city of Lansing. The bus companies sought to restrain the city from enforcing the ordinance. They brought action against the city in the Ingham County Circuit Court, claiming the city had no right to force the buses to operate on certain streets in Lansing.

Judge Leland W. Carr of the Circuit Court upheld the ordinance and after an appeal of the plaintiffs the Supreme Court affirmed the decree of the Circuit Court.

Taxicab Operation in Cincinnati Under Control

The City Council of Cincinnati, Ohio, passed an emergency ordinance on March 16 requiring taxicab owners to carry insurance against personal and property damage. The policies for personal injuries to passengers must provide a $5,000 liability for a single personal injury and $10,000 for two or more persons for any one licensed vehicle. Damage to property must be covered by $1,000 insurance for one cab.

In the case of property damage the insurer has the option of limiting his total liability as follows:

For not more than two public vehicles	$2,000
For each vehicle in excess of two, not in excess of five	1,000
For each vehicle in excess of five, not in excess of ten	750
For each vehicle in excess of ten, not in excess of 25	500
For each vehicle in excess of 25, not in excess of 50	300
For each vehicle in excess of 50	200

Tax Subject Under Discussion in St. Louis

The St. Louis Bus Company, the bus auxiliary of the United Railways, St. Louis, Mo., paid taxes the past year of $155,306, or almost double that of the preceding year. The competing bus company, the People's Motorbus Company, for the last year paid the city $63,803 in a special tax on the basis of 3 per cent of gross receipts. In the previous year this tax totaled $66,909.

The legislative committee of the St. Louis Board of Aldermen on April 6 voted to shelve the bill to raise the special tax on bus companies from 3 per cent to 5 per cent of their gross receipts. Mayor Miller and Director of Streets and Sewers Brooks and Street Commissioner Joseph Slater had advocated the passage of the bill.

Mayor Miller, comparing the taxes paid by the People's Motorbus Company with those of the United Railways, contended that the 5 per cent tax bill would tend to equalize the taxation of these public utilities. Richard W. Meade, president and general manager of the People's Motorbus Company, answering Mayor Miller's contentions, presented to the aldermanic committee a memorandum on the comparative tax assessments of the United Railways and the People's Motorbus Company.

New York Board Still Marks Time on Bus Proposals

No solution of New York City's bus problem was reached on April 8 at a hearing before the Board of Estimate. Mayor Walker did announce his intention of moving for a vote on the award of bus franchises at the next meeting of the board on April 21. There was no indication, however, that he would be able to get the twelve votes in the board necessary to award the franchise for Manhattan, Brooklyn and Queens to the Equitable Coach Company, which he favors, or that the board would vote to award the franchises for the Bronx and Richmond.

Substitution an Issue in Tarrytown

No action was taken at the meeting at Tarrytown, N. Y., on April 11 on the matter of local transportation there. It was a joint conference between the boards of Tarrytown and Elmsford and the town of Greenbush, comprising the whole township, and among those who attended were Judges Duell, McDowell and Seely. President S. W. Huff of the Third Avenue Railway and counsel for that company explained the position of the railway in the matter. Railway officials favor the continuation of that service, but the cost to the company of improving the roadbed under the repaving program proposed by public officials would be more than $300,000. This is an expenditure the railway considers prohibitive. The present fare by trolley is 5 cents in the zone from White Plains to Elmsford and 5 cents from Elmsford to Tarrytown. The fare suggested by bus is 10 cents from White Plains to Elmsford and 15 cents from Elmsford to Tarrytown. The next meeting to consider the matter is subject to call by Supervisor Williard.

Indiana Service Seeks to Abandon Unprofitable Bus Lines

Authority to discontinue approximately 135 miles of intercity bus lines in northeastern Indiana is asked in a petition filed with the Indiana Public Service Commission by the Indiana Service Corporation, Fort Wayne. The lines over which the company proposes to abandon service are between Fort Wayne and Marion, 57 miles; Fort Wayne and Angola, 46 miles; Angola and Crooked Lake, 10 miles, and Angola and Coldwater, Mich., 22 miles. Interurban electric railway lines are operated by the same company between Fort Wayne and Marion and between Fort Wayne and Waterloo, near Angola.

In a statement accompanying the petition, Robert M. Feustel, president, said that the thirteen months ended Jan. 31, 1927, had shown a net operating loss of $19,411 on the Fort Wayne-Marion line. Income, he said, was $8,083, as against operating expenses totaling $27,494.

Blue Goose Fare Increased.—Fare on the Blue Goose Bus Line, operated between St. Louis, Mo., and Alton, Ill., by the Alton Railway, affiliated with the East St. Louis & Suburban Railway, has been increased from 65 cents to 90 cents for one way. The new rate became effective on April 10. The interurban fare on the cars of the St. Louis & Alton Railway will continue at 85 cents for one way or $1.50 for the round trip.

Bus Patronage Disappointing.—The Connecticut Company, which recently opened a new bus line between Newington Junction and Hartford, Conn., via West Hartford, has not carried the expected patronage. The Board of Selectmen of Newington is to take steps to advertise the advantages of the service offered by the railway. Schedules are to be printed and personal letters sent to the people, especially those who petitioned for the route.

Bus Service Starts.—The Washington, Baltimore & Annapolis Electric Railroad installed on April 1 a new, comfortable and de luxe coach service between Washington and Annapolis over the new National Defense Highway. Coaches leave Washington daily, including Sundays, at 9:30 a.m., 1:30 p.m. and 5:30 p.m. and leave Annapolis, including Sundays, at 8:30 a.m., 1 p.m. and 5 p.m. The one-way fare is $1.22 and the round-trip fare $2.32. Children under twelve years of age are carried at approximately half fare. Buses also serve intermediate points en route at proportionate fares. In Washington buses stop at all of the principal downtown hotels. This is in addition to the electric railway service that has been operated for years by the Naval Academy Junction Line.

Bus Service Replaces Railway.—The Northampton Street Railway discontinued its railway service between Northampton and Hatfield, Mass., at the close of business on April 13 and started bus operation in its place. This was the last link in the route from Northampton to Greenfield, formerly operated by the Connecticut Valley Street Railway. Tracks above North Hatfield are already removed and those from North Hatfield south to Northampton will be removed soon.

New Bus Project Made Known.—Plans have been announced by Mayor Frank X. Schwab of Buffalo, N. Y., for the establishment of another municipal bus line, although all previous attempts to operate municipal buses in Buffalo have resulted in failures. The latest idea of the chief official is to operate municipal buses in Kensington Avenue from Bailey Avenue to the easterly city line at a 5-cent fare with a 3-cent half-fare charge. The International Bus

Corporation, a subsidiary of the International Railway, and the Buffalo Motor Coach Company, Inc., have applications pending for the operation of buses in this section of the city where there are now no transportation facilities.

Eight Cents on Bus Line.—An 8-cent fare has been established between any two points in the city of Hudson, N. Y., on the bus line of the Eastern New York Transportation Corporation. Tokens, each good for a continuous trip between any two points, will be sold 17 for $1, but will not entitle the passenger to transfer to interurban cars of the Eastern New York Utilities Corporation, the parent company. Transfers to the interurban cars of the latter company will upon request be issued by operators of buses which connect with the cars and which buses are so marked. Valid single trip and commutation tickets, good on Eastern New York Utilities cars, will be accepted as part of a continuous trip. Tokens will not entitle passengers to transfers.

Double-deckers on Pleasant Sundays.—All single-deck coaches heretofore operated on the Morningside and Highland-Virginia Avenue lines of the Georgia Power Company, Atlanta, Ga., are to be replaced by double-deck coaches on all pleasant Sundays during the summer months. The schedules on Sundays are to be the same as the daily schedules. Both lines are operated through some of the most beautiful residential sections of the city.

Working Out Bus Schedule. — The Northland Transportation Company, Minneapolis, Minn., has bought the Mesaba Railway Coach Company, which serves communities between Aurora and Hibbing and has local runs in Virginia and Eveleth. The transaction is subject to the approval of the State Railroad and Warehouse Commission. The acquisition of this property gives the Northland company virtual monopoly of the transportation business on the range. The company already has a bus line running from Duluth north through Virginia and it is understood that buses on the line running east and west through Virginia will be scheduled to connect with buses on the north and south line out of Duluth. Abandonment of the electric line has been ordered by the federal court.

Railway Supplies Service; Bus Petition Denied.—The Public Service Commission has denied the petition of William A. Stone, doing business as the Silver Lake Park and White Plains Bus Line, for permission to operate a bus line in White Plains, N. Y. When this petition was filed the Silver Lake railway line was not in operation, as the receiver of the Westchester Street Railroad had discontinued service. The proposed bus line was intended to serve substantially the same section of White Plains as this branch of the railway. Subsequently, the Westchester Street Transportation Company, Inc., which succeeded the electric railway and is owned by it, resumed service and also obtained the consent of the city and the Public Service Commission to substitute buses for street cars. It was the opinion of the commission that the operation of a bus route in addition to the railway was not necessary.

Financial and Corporate

$58,157,236 Value at St. Louis

State Commission Allows $6,395,888 for Additions Made to United Railways Property Since Year 1919

The United Railways, St. Louis, Mo., earned a return of only 4.2 per cent on its properties during 1926, a report of auditors for the Missouri Public Service Commission filed at Jefferson City on April 2 shows.

The audit sustains the contention of Receiver Rolla Wells that the company operated at a loss during 1925 and 1926 after paying interest on bonded indebtedness. The net loss for 1925 was $172,247 and for the first ten months of 1926 the deficit was $52,730, the report shows.

As a result of the audit the new valuation of the railway's properties for rate-making purposes is $58,157,236, including $6,395,888 in additions since 1919, when the valuation was found to be $51,761,348.

The auditors found the amount available for return in the first ten months of 1926 was only $2,039,886 and on that basis estimated the total for the entire year at $2,447,864. This is only 4.2 per cent of the $58,157,236 valuation.

The audit was made to determine the net amount of expenditure for additions and betterments between Jan. 1, 1919, and Oct. 31, 1926, and to determine results of operations in 1926 up to Oct. 31.

The auditors were J. J. Murphy, chief accountant for the commission; H. W. Ross, accountant in charge, and George B. Coleman, A. L. Houlehan and H. B. Lysaght. The investigation revealed:

Average requirements for working capital, $2,109,105.

Gross operating revenues for 1925, $18,913,332; operating expenses, taxes, depreciation, $16,445,402; net, $2,467,929.

After adding non-operating income and deducting interest, discounts and miscellaneous the deficit for 1925 was $172,247.

For first ten months 1926 operating revenues were $15,671,311 and operating expenses, taxes and depreciation $13,631,424, leaving a net revenue of $2,039,886. After adding non-operating income and deducting interest, discounts and miscellaneous items the deficit for the ten months was $52,730.

The estimated amount available for return in 1926, based upon first ten months, was $2,477,864, compared with $2,467,929 in 1925.

The audit revealed the payments for personal injuries and property damage claims in the period April 12, 1919, to Oct. 31, 1926, were $8,000,000.

The credit balance in the depreciation reserve as of Oct. 31, 1926, was increased by almost $900,000 by the auditors in their adjustments, which showed credits of $1,004,356 and debits of $114,931.

The total estimated liability of the company for personal injuries and damage claims as of Oct. 31, 1926, was $1,549,840, while the balance in the reserve on that date was $645,629, a deficit of $904,210. The company has based its credits to this reserve at 6 per cent of gross receipts.

In their report the auditors expressed the opinion that a fixed percentage of gross revenues does not appear to be the best method for measuring the cost of injuries and damage claims since fares and gross revenues may go up or down without affecting traffic accidents. The report stated that "in our opinion 'cost per car-mile' is a more scientific method for measuring injuries and damages."

Receiver Wells filed his first petition for a higher fare some months ago. The city then demanded an audit of the company's books to determine whether an increase was warranted. From Feb. 5 to March 1 under a federal court injunction the company charged a fare of 8 cents, with two tokens for 15 cents, but this rate was later set aside by a special federal court of three judges.

The company now has an application for increased fares pending before the commission. A fare of 8 cents, with two tokens for 15 cents, has been asked. In view of the findings of the auditors for the commission it is very probable the company will be granted the increase.

The bringing of the company's valuation up to date is expected to speed up the negotiations between Mayor Miller and the reorganization committee on a new franchise for the railway under the service-at-cost plan.

$1,885,000 Boston "L" Issue Offered

A syndicate composed of Paine, Webber & Company, White, Weld & Company, Stone & Webster & Blodget, Inc., of New York, and the First National Corporation, Boston, offered for subscription on April 14 $1,885,000 of ten-year 5 per cent gold bonds of the Boston Elevated Railway, Boston, Mass. They were priced at 100¾ and interest to yield 4.90 per cent. The bankers stressed the point that the net earnings are about 2¼ times the rentals and interest charges.

$7,000,000 Cincinnati Street Railway Issue

A syndicate headed by the Guaranty Company, New York, and W. E. Hutton & Company offered publicly on April 11 $7,000,000 of first mortgage series A 5½ per cent gold bonds of the Cincinnati Street Railway, Cincinnati, Ohio, to mature April 15, 1952, at 100 and accured interest, to yield 5½ per cent. The issue has been authorized by the Director of Public Utilities of the city of Cincinnati and the Public Utilities Commission of Ohio, and the proceeds will be used to retire outstanding $4,500,000 of 6 per cent notes, to reimburse the company for capital additions heretofore made and to provide funds for further additions and other corporate purposes.

The bonds will be a direct first lien on all fixed property and all equipment now owned by the company, except a part of the company's railway cars on which there is a prior lien represented by $711,400 outstanding equipment trust certificates.

Changes in Foshay Company Corporate Structure

Although the W. B. Foshay Company, Minneapolis, Minn., has sold its controlling interest in the Peoples Light & Power Corporation, its utility business will continue as in the past. The Foshay company now operates electric, gas and artificial ice properties in Nogales, Ariz., and Nogales, Mexico. valued at $1,600,000. It has under contract electric and gas properties which are in operation in Vermont, Kansas and Idaho.

The name of the W. B. Foshay Company's new public utility holding company will be Public Utilities Consolidated Corporation. This corporation will operate the Arizona company, which will be called Public Utilities Arizona Corporation. When public utility properties which are under contract in other states are taken into the holding company, they will be known as Public Utilities Vermont Corporation, Public Utilities Kansas Corporation and Public Utilities Idaho Corporation.

Readjustment in Grand Rapids

Voluntary Recasting of Financial Structure of Grand Rapids Railway Proposed—Financing Can Be Done Now Only Through First Mortgage Bonds—The Details

A PLAN of readjustment has been suggested for the Grand Rapids Railway, Grand Rapids, Mich., which contemplates the organization of a new company to take over the assets of the present company and the cancellation of all of its common stock, and extinguishment of $600,000 of its indebtedness through the issue of common stock of the new company, and the exchange of preferred stock on the basis of two shares of new company common stock for one share of present preferred stock, the depositors of which are also offered subscription rights. The plan also provides for the authorization of additional preferred stock by the new company to provide funds further to reduce existing indebtedness and for other corporate purposes.

CAPITAL EXPENDITURE SITUATION OF GRAND RAPIDS RAILWAY

Payments:		
Bonds maturing June 1, 1919..		$3,700,000
Construction from June 1, 1919, to Dec. 31, 1926		1,411,892
Reacquirement of $229,000 first mortgage bonds of present issue through sinking fund, etc.		206,000
Total payments for capital purposes		$5,317,892
Receipts:		
$3,200,000 first mortgage bonds sold....	$2,944,000	
Insurance moneys received on account of Hall Street carhouse property and cars destroyed by fire	368,395	
Provided out of earnings and reserves..	559,298	3,871,693
Leaving net increase in debt junior to first mortgage bonds amounting to		$1,446,199
Now represented by:		
Gold debenture 7 per cent	$700,000	
Car trust notes	198,045	
Increased amount of paving assessments not due	69,977	
Increased amount of accounts payable ..	58,218	
Advances payable ..	245,458	
Bank loans	174,500	

It is explained that the changes suggested are deemed advisable at this time because of the large floating indebtedness of the old company and its lack of a medium for doing any financing other than through first mortgage bonds which cannot be issued and sold in sufficient amount or at advantageous prices in view of the company's present condition. The present floating debt position dates back to June 1, 1919, when three-year bonds amounting to $3,700,000 became due, which bonds were in turn issued to refund the long term 5 per cent bonds originally issued in 1900. The capital expenditure situation since June 1, 1919, is shown in the accompanying table.

The present outstanding first mortgage bonds require sinking fund payments of $80,000 annually and the car car trust notes become due about $8,000 a month or approximately $98,000 a year until their final maturity May 26, 1929. Thus these two items alone constitute a cash requirement of about $178,000 a year. It is believed the consummation of the plan will enable the company again to sell its first mortgage bonds at prices more nearly approaching par, and an agreement has been reached for the sale of $200,000 of first mortgage bonds upon the plan being declared operative, the proceeds to be applied to the retirement of all the car trust notes, thus ending the monthly drain on the cash resources on their account, which with saving of interest on the $600,000 debt canceled will reduce the annual cash outlay by about $140,000. The proceeds from the new preferred stock will be applied first to the liquidation of bank loans and thereafter to the liquidation of other indebtedness and thereby improve the current asset position and thus to that extent free the cash derived from earnings and make it available for payment of dividends, first on the new preferred stock and then on the new common stock.

The 100,000 shares of new common stock are to be issued in consideration of the extinguishment of $600,000 of present outstanding debt of the Grand Rapids Railway (i.e. cancellation of $245,000 advances payable and $355,000 gold debenture 7 per cent bonds), the cancellation of $2,000,000 par value of old common stock and the making to the holders of the old preferred stock of the exchange and subscription offers outlined in the plan. Assuming that all the holders of old preferred stock exchange and subscribe to the full amount of new preferred stock offered under the plan, there would result:

100,000	shares new common stock issued
40,000	shares new common stock to holders of 20,000 shares old preferred stock
60,000	shares new common stock representing consideration for extinguishment of $600,000 of debt
15,000	shares new common stock of which will be delivered if entire $300,000 new preferred stock offered under the plan is subscribed
45,000	shares remaining in hands of holders who cancelled the $600,000 of debt
15,000	shares of which will be reserved for delivery upon payment to them of $10 per share upon exercise of options expiring May 1, 1929. delivered to subscribers under the plan.

The earnings position of the new company, based upon all matters outlined in the plan as applied to the actual earnings for twelve months ended Feb. 28, 1927, will be:

Gross earnings	$1,774,748
Operating expenses and taxes:	
Operating expenses	1,091,267
Taxes	153,671
Total	$1,244,939
Gross income available for fixed charges, retirements and dividends	$ 529,809
Annual interest at 7 per cent on $3,171,000 mortgage bonds...	221,970
Interest on $219,500 debentures	15,365
Interest on unpaid paving assessments	5,052
Total interest and other fixed charges	$ 242,387
Balance	$ 287,421
7 per cent on $300,000 preferred stock	21,000
Balance available for retirements and other purposes.....	$ 266,421

In September, 1922, an ordinance ratified by the voters granted the Grand Rapids Railway a 30-year franchise and provided a sliding scale of fares based on net return upon valuations agreed upon in the franchise. This franchise will be assumed by the new company. The original value placed upon the property was $5,500,000 as of Jan. 1, 1922, which with subsequent additions to Feb. 28, 1927, amounts to $6,043,234. The rates of fare now in effect, viz., 10 cents cash and six tickets for 50 cents, were instituted at the beginning of 1925, at which rates the property is entitled, according to the franchise terms, to earn a return of 7¾ per cent on its value after deduction of operating expenses and taxes, and an amount equal to 3 per cent of the value of the property for retirement reserve. As of Feb. 28, 1927, the deficit in the automatic fare equalization account was $423,173; in other words, that is the amount that the property failed to earn the return allowed under the franchise from its date to Feb. 28, 1927. It is estimated that if the full return allowed by the franchise is realized the earnings would be increased $98,912.

Deducting from $266,421 the balance of earnings previously indicated, 3 per cent of the present value of the property for retirement reserve, or $181,297 there would remain available $85,124, or 85 cents a share on the 100,000 shares of the new company common stock to be issued and outstanding. If the charge for retirement reserve were modified to 2 per cent or $120,864, an amount the management believes adequate in view of the present excellent condition of the property, the sum of $145,557 would be available for the 100,000 shares of common stock of the new company, to be issued and outstanding. This would mean a return on the stock at the rate of $1.45 per share.

Deal on for Newport Electric Corporation

Offer of $150 a share on option has been made for control of the Newport Gas Light Company by the Utilities Power & Light Corporation of Chicago. The Colonial Gas & Electric Light Company, which controls Newport Electric Corporation, is a subsidiary of Utilities Power & Light. No action either toward recommending or advising against sale has yet been taken by the directors. The Newport Electric Corporation operates 22 miles of electric railway and city and interurban bus service in which nineteen buses are used.

$159,000,000 in Boston "L" Against $25,000,000 in 1897

A chart prepared by the Boston Elevated Railway, Boston, Mass., shows some of the important facts regarding the Boston Elevated Railway in terms of increase from 1897.

At present the investment of about $159,000,000 in the property is roughly 530 per cent greater than that of 1897, which was somewhat more than $25,000,000. The investment has on the whole increased steadily, with a rapid increase in 1917-1918, and very slight increases in some years, such as 1912-1913, 1919-1921 and 1924-25. The average annual investment has been about $4,500,000.

Revenue passengers carried have about doubled, but since 1914 the annual total has remained fairly constant. Riding, however, has increased faster than the population.

The population is now a little more than 50 per cent greater than in 1897, and is still rising, although somewhat slowly at the present time.

The relation of riding and population is reflected in the revenue rides per capita, which in 1917 were 50 per cent greater than in 1897. The increase in fare which the trustees found necessary as soon as they took hold of the property resulted in some falling off. This loss has since been recovered in part. While the total of revenue passengers is about as great now as ever, the population increase lowers the ratio.

Eastern Massachusetts Does Well

Intensive Merchandising of Service Helps Road Operating in Suburban Boston Territory

The Eastern Massachusetts Street Railway, Boston, Mass., reports for 1926 an increase of $149,855 over 1925 in revenue from all sources, but the cost of operation before taxes, interest and rental charges was $182,484 greater than the previous year. In 1926 the company failed to earn operating expenses and depreciation (not including taxes and interest) by $62,207, compared with a loss of $82,823 in 1925.

Revenue from all sources in 1926 was $9,788,035, an increase over 1925 of $149,855. Expenses including depreciation, taxes, etc., in 1926, were $7,807,332, an increase over 1925 of $199,295. Gross income in 1926 was $1,980,703, a decrease from 1925 of $49,440. Interest and rentals, etc., in 1926 were $1,245,865, a decrease from 1925 of $45,955. Net income available for dividends in 1926 was $734,838, a decrease from 1925 of $3,485.

Dividend payments of $866,522 were made in 1926 as follows:

First preferred	$249,165
Sinking fund	1,929
Preferred B	179,868
Adjustment	435,560
Common	none

On the first preferred and sinking fund stocks payments of 3 per cent were made on Feb. 15 and Aug. 15. On preferred B, payments of 3 per cent were made on Feb. 1 and Aug. 1. On adjustment stock, payments of 2½ per cent were made on April 1 and Oct. 1.

Bonded obligations were retired and paid at maturity as follows: $131,000 Bay State equipment 6's due Aug. 1, 1926; $300,000 Eastern Mass. series A 6's, due Jan. 1, 1927; $115,000 Eastern Mass. series C 6's, due Feb. 1, 1926; $2,500 par sinking fund stock, series 7, due Feb. 1, 1926, paid and canceled.

The largest factor in the increased expenses was the additional burden imposed by a board of arbitration which not only granted the blue uniform, line, power and rolling stock and miscellaneous employees on increase of 1½ cents an hour but also established an eight-hour day and time and one-half for all overtime.

As compared with 1924 and 1925, when there were decreases of $993,343 and $449,395 respectively, an increase in 1926 of $136,501 in revenues is encouraging. This increase is attributed in a considerable measure to an advance in ticket fares which took effect on Oct. 1, and to weather conditions in November and December, the early snows and low temperature causing private automobile owners to store their machines and ride in street cars.

The percentage increase in riding for these two months was substantially the same throughout the system. Total passenger car miles operated in 1926 were 17,731,483.

Realizing that the principles of merchandising must be applied to the railway as in every other business, the company has pursued the policy of improving its cars by large expenditures for painting, various up-to-date devices and the installation of de luxe seating and lighting facilities and linoleum flooring. This program will be consistently followed. In this connection the company now operates between Brockton and Mattapan, Lowell and Everett terminal and Lawrence and Everett terminal high-speed cars of the very latest type at popular reduced rates of fare. Increased earnings are reported on all three of these de luxe lines.

In addition the company has recently purchased 50 new light-weight, high-speed cars embodying the new ideas of comfort and convenience. These are to take the place of cars worn out in the service. Delivery is expected during May and June. The new cars will be paid for from the depreciation reserve accumulated for that purpose.

As might be expected, in view of the arbitration award, the cost of car operation was $162,380 more than in 1925, overshadowing all other items of increased expense. Wage comparisons for 1926 and 1925 follow:

	1926	1925
Wages two-man car operators	$158,683	$154,241
Wages one-man car operators	1,527,011	1,468,430
Wages carhouse employees	177,466	165,183

The cost of snow fighting in 1926 was $141,845, compared with $54,693 in 1925. Approximately 70 per cent of this was paid in wages.

Other increases in expenses were:

Way and structures	$8,273
Law expenses	13,429
Rent of track	7,355
General wages and expenses	12,591
Pensions	2,215
Stationery and printing	1,717
Miscellaneous expenses	23,857

The claim department made a very creditable showing, the total expenditures for the year being $262,165, the smallest yearly amount since public control began and less by $32,495 than the previous year. Other decreased expenditures were for: equipment, $24,-

INCOME STATEMENT OF EASTERN MASSACHUSETTS STREET RAILWAY

	1926	1925
Street car revenue	$8,699,914	$8,563,413
Auto bus revenue	321,317	278,758
Express and other revenue	41,879	42,757
Rentals, advertising, etc.	198,051	205,713
From sale of power	272,527	†313,248
Interest and other income	254,347	234,291
Total revenue	$9,788,035	$9,638,180
Expenses:		
Way and structures	$1,229,616	$1,221,343
Equipment	1,230,046	1,254,192
Power	1,281,790	†1,277,787
Car operation	2,378,475	2,216,095
Injuries and damages	262,166	294,661
Insurance	73,810	84,895
Law expenses	40,255	26,826
Rent of tracks	80,167	72,812
General wages and expenses	235,724	223,133
Pensions	23,045	20,830
Group insurance	64,866	64,402
Stationery and printing	37,201	35,484
Stores and garage expenses	53,299	61,316
Miscellaneous expenses	68,210	44,353
Auto bus expenses	383,524	361,581
Total operating expenses	$7,442,194	$7,259,710
Total operating expenses and taxes	$7,807,332	$7,608,037
Gross income	1,980.703	2,030,143
Interest and rentals	1,245,865	1,291,820
Net income	$734,838	$738,323

Operating expenses include charges for depreciation amounting to $917,940 in 1926 and $898,254 in 1925. During 1926 $745,578 of the depreciation reserve was applied to reconstruction and amortization.

† Of the amount $313,248 in 1925—$304,930 was included in report for 1925 as a reduction to power expense; the difference, or $8,318 included with "rentals, advertising, etc."

146; insurance, $11,085; stores and garage expenses, $8,017.

The attitude of the trustees on the matter of bus operation is that where the company has rails and overhead construction in good condition and there is sufficient volume of business to warrant the continuance of electric cars, it would be unjust, not only to the owners of the property but to the riding public, to supplant street cars with buses. In densely populated areas the addition of a multiplicity of buses would throw an unwarranted burden upon communities whose principal highways are already overloaded with motor traffic. On the other hand, there are some small communities in which there are no peak loads and where the bus can be used to advantage and principally in the handling of this type of business the company operated in 1926 1,287,167 bus-miles, this being 207,451 more miles than in 1925. Wherever, in the territory served by the railway, the trustees know that there is only enough "pole to pole" transportation business for one responsible carrier, and there is a threat of bus competition they do not intend to be coerced or driven to establishing a duplicate and wasteful service. On this point the trustees say:

> Our duty to the car riders and the owners of this road is clear and we propose to perform it. Among those who would be first to condemn us if the fallacious reasoning of the advocates of paralleling street car lines with bus line were adopted and the inevitable higher fares and deteriorating service followed, would be these same, perhaps well-intentioned but misinformed, partisans of such an experiment.
>
> Wherever public convenience and necessity require service, this company, with permission from the proper authorities, will perform it, either with street cars or buses.

All of the bus lines operated in 1925 were continued in 1926. In addition bus operation was substituted for railway service between Rockland and Braintree and between Weymouth and Hingham, where the rails were worn out and rebuilding was out of the question because of its great cost and the comparatively small receipts of the route. Bus revenues for the entire system increased $42,559; expenses were $21,943 more than last year. The company now owns 65 buses and motor coaches, representing an investment of $458,608 and operates them in eighteen cities and towns.

It also runs an interstate route between Taunton and Providence, and during the summer months runs lines between Mattapan and Nantasket and Neponset and Nantasket. To aid in snow fighting on bus lines, seven caterpillar tractor snow plows were purchased during the year at a cost of $33,810. There are now 37 bus snow-fighting units on the system. During the summer months part of this equipment is available in connection with track and other types of construction.

Reference was made in the last annual report of the public trustees to the bill in equity brought by L. Sherman Adams, a stockholder, seeking to compel the public trustees to pay dividends claimed to have accrued on the common and adjustment shares of the company to Feb. 1, 1924. As stated in the last annual report, the master appointed by the Supreme Court to hear the evidence and find the facts filed his report on Jan. 29, 1926, after long hearings. The case was reserved upon the pleadings, the master's report and the exceptions of both parties for the consideration of the full bench of the Supreme Judicial Court. The case was argued March 18, 1926, and the opinion of the full bench of the Supreme Court was rendered on Oct. 2, 1926. In its opinion, the Supreme Court over-ruled the exceptions of the plaintiff and sustained thirteen out of fourteen exceptions of the defendants, and ordered a final decree to be entered dismissing the plaintiff's bill with costs.

The trustees point out that at no other period in the history of this company has the rolling stock throughout the system been in such good condition. They ascribe this as due to the systematic and intensive program of overhauling which was started several years ago. Every car in regular service has been through the repair shop, either at Chelsea or Brockton, painted inside and outside and thorough attention given to mechanical details. The results are apparent even to the casual observer. Twofold benefits are set down as having accrued from the establishment of this policy: the net cost of maintenance has been greatly reduced and the company also enjoys the advantage of doing business with well pleased customers.

In 1920, 14,336 crippled cars were taken out of service and pulled in the carhouses, this being at the rate of one defect for every 1,550 miles of operation. In 1926 only 685 crippled cars were pulled in, this being at the rate of one defect for very 27,110 miles of operation. In the Brockton-Mattapan, Lowell - Everett terminal, Lawrence-Everett terminal de luxe service, the rolling stock department outfitted nineteen cars at the cost of $1,500 a car.

Conferences Look Toward Sale of Hocker Line

Negotiations are under way for the sale of the Kansas City, Lawrence & Topeka Electric Railroad, a 12-mile interurban, known as the Hocker line, to the Kansas City Public Service Company, Kansas City, Mo. The line has been in receivership for the past eight years. It operates between Kansas City and Zarah, Kans., passing through Merriam and Shawnee where the chief patronage lay.

As a basis for the negotiation, W. K. Paul, superintendent of the line for the receiver, is preparing a complete report of the physical assets to be presented to officials of the Kansas City Public Service Company. It is known that Fred G. Buffe, vice-president of the Kansas City Public Service Company, made a survey of the Hocker line a year ago, prior to the termination of the receivership of his company.

The Kansas City, Lawrence & Topeka Electric Railroad was organized in 1907 by the late R. W. Hocker. All the stock of the company is held by the Hocker estate and by F. P. Dickson, president of the company. The original plan was to extend the line through to Topeka and a start toward this end was made in 1916 when the line, which ended at Shawnee, was extended to Sarah, a distance of 6 miles. The coming of the World War halted development.

Increase in Revenue in Boston.—For the month of January, 1927, the revenue of the Boston Elevated Railway, Boston, Mass., exceeded cost of service by $186,947 compared with an excessive revenue of $223,301 in January, 1926. The revenue passengers numbered 34,160,787, against 33,144,528 for January, 1926. In January of the current year 5,004,125 miles were operated, against 4,871,361 in January of the year preceding.

Jersey Issue Oversubscribed. — The offer of 30,000 shares of 6 per cent cumulative preferred stock of the Public Service Corporation of New Jersey, Newark, N. J., to customers of its subsidiary companies on April 1 has been oversubscribed. Subscriptions for 33,561 shares had been received from 6,818 persons at close of business on April 6. The average number of shares per subscription was less than five. This issue, sold in five working days, is a new record for the company.

Stock Issue for Improvements.—The Cleveland Railway, Cleveland, Ohio, has been authorized by the Ohio Utilities Commission to issue $2,904,600 in capital stock at $100 a share plus accrued interest. The additional money is to be used for extensions and improvements including the buying of buses and cars.

Investment Expert Discusses Chicago Issues.—Wm. Hughes Clarke, Chicago, dealer in investments bonds and stocks, has issued a circular in which he has reviewed earnings and other data covering the combined Chicago Surface Lines and the separate companies. He is also the author of articles contributed to the Feb. 26 and March 5 issues of the *Financial World* containing summaries covering the Chicago traction situation interesting to all who are concerned with electric railway operations and investments.

Oppose Abandonment.—Protests are being filed with the Public Service Commission to enjoin the Portland Electric Power Company from discontinuing 12 miles of interurban line between Montavilla Depot, Portland, Ore., and the town of Troutdale, Multnomah County. The company is applying for authority to discontinue the branch of service on the grounds that the operation of motor trucks and private automobiles has become so great that the railway can no longer operate with profit.

Authorized to Sell Land.—The Pacific Electric Railway has been authorized by the California Railroad Commission to sell to the Pacific Electric Land Company for the sum of $126,000 a number of parcels of land along its Newport Beach line, partly in the city of Long Beach, and partly in the city of Seal Beach, Orange County.

Union Street Railway Shows Deficit.—For the calendar year 1926 the Union Street Railway, New Bedford, Mass., reported a deficit of $1,748, after deducting dividends, which were equivalent to 6 per cent on the company's capitalization of $2,437,500. For 30 years previous the annual dividend had been 8 per cent. The profit and loss surplus as of Dec. 31, 1926, was $619,927. This company is the last with a 5-cent fare unit in Massachusetts; the railway now proposes a 10-cent fare.

Personal Items

Personnel Changes in Richmond

The election of William E. Wood to the presidency of the Virginia Electric & Power Company, Richmond, Va., to succeed Luke C. Bradley resulted in numerous advancements.

J. Franklin McLaughlin will be in charge of operations of the company with offices at Richmond.

Thomas P. Walker, who has previously been in charge of properties under Stone & Webster management in El Paso, Tex., will succeed Mr. McLaughlin as vice-president in charge of the Norfolk Division. T. Norman Jones, Jr., will become general manager of the Norfolk division. J. B. Hayes, formerly assistant to the president, will become general superintendent of transportation of the Norfolk division, reporting to the general manager of the Norfolk division. R. C. Hopkins succeeds Mr. Hayes as assistant to the president and to the vice-president in charge of operations.

Other changes include the following: Louis F. Riegel, heretofore sales manager for Richmond, will become general sales manager for the system, reporting to the vice-president in charge of operations. W. E. McCreery, sales manager of the Norfolk division, will hereafter report to the general sales manager. C. S. Stackpole, formerly of the sales department of the Norfolk division, will succeed Mr. Riegel as sales manager of the Richmond division and will report to the general sales manager. O. W. Morton, formerly assistant to the vice-president of the Norfolk division, will become sales manager for Norfolk, reporting to the sales manager of the Norfolk division. E. H. Hill, formerly assistant superintendent of the electric department of the Norfolk division, will succeed Mr. Morton as assistant to the vice-president of the Norfolk division. E. F. Turner will become superintendent at Fredericksburg, succeeding Mr. Venable.

W. L. Snodgrass Heads New Department in Fort Wayne

The Indiana Service Corporation, through Henry Bucher, manager of railways, recently announced that a separate department had been formed to handle all traffic matters. This new department was made necessary because the combined work of transportation and traffic matters, which has been handled by J. A. Greenland, had grown to a point where it was necessary to organize a new department.

The new department will be known as the traffic department. It will be under the direction of W. L. Snodgrass, with the title of superintendent of traffic. Mr. Snodgrass has had considerable experience in traffic matters and for some time past has been in charge of traffic solicitation for this company. Under the new arrangement he will move from LaFayette to Fort Wayne.

Mr. Greenland, superintendent of transportation, will continue to supervise all transportation matters.

N. T. Brown a Vice-President in Buffalo

Nelson T. Brown has been elected vice-president in charge of transportation of the International Railway, Buffalo, it was announced by Bernard J. Yungbluth, president of the corporation. Mr. Brown comes to Buffalo from Philadelphia, where he has been in charge of the bus division of the Philadelphia Rapid Transit Company for the last five years. He has been associated with railway interests in Philadelphia for 25 years. Mr. Brown has already assumed his new position in Buffalo.

F. M. Mills of Sioux Falls Honored

Frank M. Mills, president of the Sioux Falls Traction Company, Sioux Falls, S. D., celebrated his 96th birthday anniversary on April 4. He is said to be the oldest active electric railway executive in the United States. When a group of representatives of the Chamber of Commerce called to pay their respects and extend felicitations, he announced that he was confidently looking forward to his centennial year. Mr. Mills launched the Sioux Falls railway system more than twenty years ago. Much of the business is now handled by his son, Roger Mills, but the elder executive is daily at his desk.

Changes in Jersey

At a meeting on April 13 of the directors of the Public Service Corporation, operating the Public Service Railway, Newark, N. J., a few changes were announced. They are as follows:

Edward A. Armstrong, assistant general counsel, was appointed general counsel.

William B. Hartshorne was made assistant to the president.

Harry P. Chandler, recently appointed executive assistant, was made chairman of the welfare committee.

Arthur Bland Made Manager

Arthur Bland, who has been director of public relations for the Southern Ohio Public Service Company, with offices in Columbus, has been made manager of the company. He succeeds R. Z. Zimmermann, who is now associated with Day & Zimmermann, Philadelphia.

George J. Carney Joins McGraw-Hill Staff

George J. Carney, who has been assistant to the director of the Wisconsin Public Utilities Bureau since 1920, became an assistant editor of the *Electrical World* on April 1. His headquarters will be in Chicago for the present, and his editorial duties will involve general editorial assistance to F. R. Innes, the Western editor of the *Electrical World*. For the past six years Mr. Carney has been engaged in utility information bureau work in Wisconsin and has served as correspondent for the ELECTRIC RAILWAY JOURNAL, *Electrical World* and other McGraw-Hill publications. He has a wide acquaintance with utility men and utility conditions in the Chicago territory.

Mr. Carney was born in Milwaukee in 1898 and after completing his education served in the World War and participated in all the major engagements of the American forces. Business experience with the Pathé Exchange, Inc., and general newspaper work preceded his connection with the Wisconsin Public Utility Bureau.

Obituary

Albert M. Lynn

Albert M. Lynn, president of the West Penn Electric Company and a director of the American Water Works & Electric Company, died in New York City at the Roosevelt Hospital on April 8. For more than 30 years Mr. Lynn had been identified in important executive capacities with the public utility properties of the American Water Works & Electric Company. Subsidiary companies include the Monongahela West Penn Public Service Company and West Penn Railways.

The late president of the West Penn property entered the employ of the American Water Works & Guarantee Company, the predecessor of the American Water Works & Electric Company, on Feb. 1, 1893, and served for some years in the general offices at Pittsburgh. He then became manager of the company's water works plant at Chattanooga, Tenn., and later of that at Birmingham, Ala. For many years thereafter he was in charge of a large proportion of the company's water works properties. In 1917 Mr. Lynn was elected president of the West Penn Company and upon the organization of the West Penn Electric Company he became its president, in which capacity he was serving at the time of his death.

Mr. Lynn was born in Indianapolis on Oct. 12, 1875, moving with his family to Pittsburgh in 1889, where he attended public schools.

William T. Nary, a superintendent of the Berkshire Street Railway, North Adams, Mass., since 1892 and one of the oldest electric railway operating officials, in point of service, in that section of the country, died in his home in Adams on April 10. He entered the employ of the Hoosac Valley Street Railway in the late '80s as a conductor on a horse car running between Adams and North Adams. The Hoosac Valley company was one of the first to electrify its lines and Mr. Nary was instrumental in making the change. As superintendent of construction Mr. Nary supervised the construction of the Williamstown-North Adams line of the Berkshire Street Railway. He was 63 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Committee Formed to Consider Cars for New York

A committee of engineers, to be headed by Col. William C. Lancaster, chief engineer of the New York Transit Commission, whose function it will be to ascertain whether a steel car of sufficiently light weight can be designed for operation on the elevated structure in New York City, was formed on April 3 at a conference held at the Transit Commission offices, attended by representatives of the Board of Transportation, the rapid transit railroads, various car construction companies, the Bethlehem Steel Company, the Westinghouse company and other organizations concerned with the subject. W. S. Menden and Frank Hedley, heads of the B.-M.T. and I.R.T. respectively, pledged their assistance in the Transit Commission's effort to ascertain whether such a car can be designed.

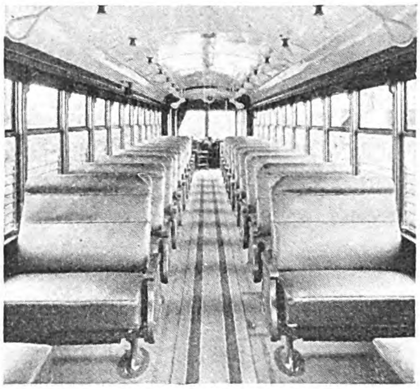
A.C.F. Sells Wire Wheel Business

The Wire Wheel Corporation of America has purchased the wire wheel business of the American Car & Foundry Motors Company, a subsidiary of the American Car & Foundry Company. The acquired business is in Detroit, and under the plan of acquisition a considerable portion of the plant equipment is to be moved to Buffalo, where the Wire Wheel Corporation is located.

The current output of Wire Wheel, will be increased from 20 to 25 per cent by the acquisition of the new concern. No present expansion of the business of the Wire Wheel Corporation is expected, he said, but that action may be necessitated later on account of increased business.

New Cars for Berkshire Railway Elicit Public's Praise

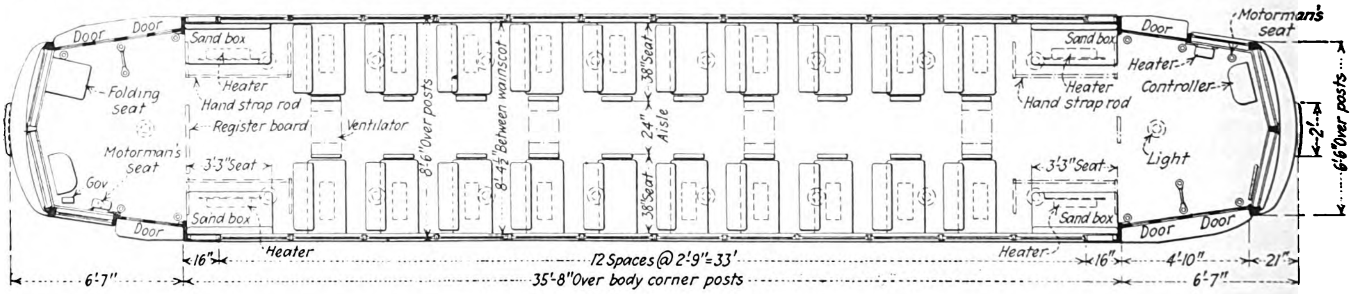
Citizens and the press of Pittsfield, Mass., have joined in praising the twelve new A.E.R.A. standard interurban double-truck safety cars recently delivered to the Berkshire Street Railway by the Osgood-Bradley Car Company, according to a recent statement from General Manager C. Q. Richmond. "We find," writes Mr. Richmond, "that the comments of the people riding and of the press have been entirely favorable and we are very sure that the placing of these cars on our lines has brought us increased business."

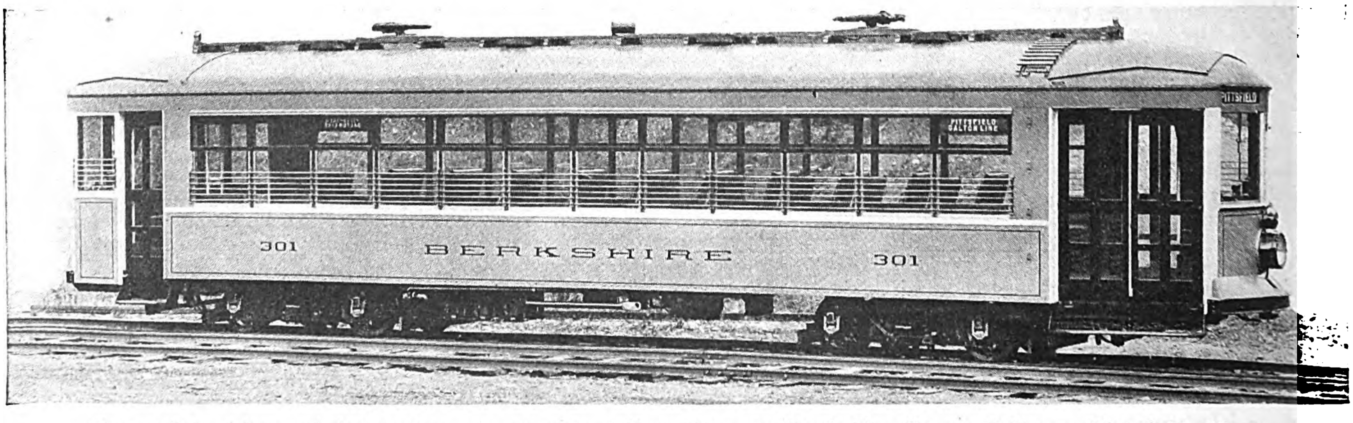


A glimpse of the riding comforts afforded by the twelve new Pittsfield cars, which were built by the Osgood-Bradley Car Company

Specifications for the cars, which were delivered late in November last year, are as follows:

Weights:	
Car body equipped	22,800 lb.
Trucks with motors	14,400 lb.
Total	37,200 lb.
Bolster centers, length	24 ft. 11 in.
Length over all	48 ft. 10 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 7⅝ in.
Height, rail to trolley base	11 ft. 3 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Armature bearings	Plain
Axles	A.E.R.A. standard E-2
Bumpers	Anti-climber
Car signal system	Consolidated
Car trimmings	J. L. Howard & Co.
Center and side bearings	Osgood-Bradley
Compressors	General Electric CP-27B
Control	General Electric K-35-KK
Couplers	Osgood-Bradley
Curtain fixtures	Curtain Supply
Curtain material	Double-faced Pantasote
Destination signs	Hunter
Door-operating mechanism,	National Pneumatic
Energy-saving device	Arthur
Fenders	Massachusetts standard
Finish	Enamel and varnish
Gears and pinions	General Electric
Hand brakes	Peacock
Heater equipment	Consolidated Car Heating
Headlights	General Electric
Journal bearings	A.E.R.A. standard
Journal boxes	Symington
Lightning arresters	General Electric
Motors	Four GE-265, inside hung
Registers	Ohmer
Safety devices	Safety Car Devices
Sanders	Osgood-Bradley
Sash fixtures	Curtain Supply
Seats	Heywood-Wakefield
Seating material	Leather
Slack adjuster	Osgood-Bradley
Springs	Fort Pitt and Railway Steel Spring
Step treads	Mason
Trolley retrievers	Earll
Trolley base	U. S. No. 20
Trolley wheels	General Electric
Trucks	Osgood-Bradley OBC-48-66-G
Ventilators	Garland C-3
Wheels	Steel Car Forge 26-in. diameter





Type of double-truck interurban car recently delivered to the Berkshire Street Railway, Pittsfield, Mass.

Bids for 100 Cars and Ten Buses for Detroit

The Department of Street Railways at Detroit, Mich., has been authorized and directed by the City Council to take bids upon 100 modern Peter Witt cars and ten single-deck, 30-passenger motor coaches for the purpose of making comparisons with the department's cost estimates for building cars of similar type. The new cars are required both to serve the longer lines that expansion into new territory brings and to replace equipment that is becoming obsolete.

Basing an estimate on a cost per car unit of $14,500 and a financing plan spread over a period of seven years with a down payment of 25 per cent and the balance bearing interest at 8 per cent, Del A Smith, general manager, cited that the cost per car would be approximately 7½ cents per mile. Taking into account the economic elements involved in these factors—seating capacity, weight per seat and cost of maintenance per year—the saving to the department would be 6.85 cents per mile, according to Mr. Smith, leaving a net cost to the department for this equipment of $182,000, or $1,820 a car.

In view of these facts and anticipating the availability of funds the commission requested permission for the taking of the bids for both the cars and buses. The bids for the cars, when received, will be compared with the department's own cost estimates for building a like type. It will be determined whether to acquire the rolling stock by purchase or to have it built by the department.

The purchase of new cars will mark a departure from the policy of Col. H. U. Wallace, former general manager, who planned to confine future purchases of rolling stock to buses. The present opinion of the management is that neither cars nor buses alone are sufficient for a complete, modern transportation system. The belief has been expressed by Mr. Smith that on certain lines buses are useful and necessary, but on other lines they can never take the place of rail transportation.

$500,000 for Improvements in Parkersburg

Improvements and addition to the railway and bus lines in and about Parkersburg, W. Va., totaling approximately $500,000 are planned by the Monongahela West Penn Public Service Company if relief from paving costs is granted by the Legislature, C. H. Hardesty, local manager of the company, and Capt. G. M. Alexander, president of the system, have stated. The company's plans call for improvement to be started as soon as the relief is secured, with the program carried to completion about 1930 or 1931.

New cars and buses to be purchased will cost more than $315,000. Some of the new cars will be used to replace present equipment; others to provide additional service on existing lines. Present plans call for the purchase of about eighteen cars immediately upon word of granting the relief. Nearly $140,000 will be spent on reconstructing trackage and more than $20,000 will be required to rebuild overhead trolleys and to renew block signals and telephones. Tracks will be rebuilt on the principal streets of the city. New overhead will be provided where needed and additional block signals and telephones will be installed.

Buses will be purchased for use in territory not served by the railway or territory where it develops that bus service is needed in accordance with a thorough study of the transportation situation in Parkersburg and its suburbs, made by the management and the company's engineers.

Copper Moving; Lead Weak

THE long-deferred buying movement in copper showed signs of materializing April 13, when a good tonnage was sold at 13 cents for Eastern deliveries. Zinc continues quiet at slightly lower prices, though the volume of sales was better than a week ago, according to *Engineering and Mining Journal.* Lead perhaps looks the weakest of any of the non-ferrous metals at the moment, business having been very poor lately. Tin has been a little lower for spot offerings, and consumers have bought somewhat more liberally for forward as well as prompt. Silver is back to 56¼ cents today after having been as high as 57⅜ cents. Antimony is distinctly stronger, being held at close to 15 cents.

Copper statistics which appeared April 13 showed a decline in refined stocks at the end of March from 105,020 to 102,637 tons and of blister from 272,219 to 260,225 tons, rather surprising in the case of blister. The rate of both domestic and export shipments improved by about 4 per cent over February. Refinery production rate decreased by close to 7 per cent and smelter production by almost 9 per cent. Mine production data are not yet available, but the indications are that the rate of mine production was cut at least 10 per cent in March. The favorable statistics stimulated demand on April 13, when more than 6,000 tons were sold, more than in some entire weeks recently. A large buying movement is overdue and may be getting under way. The foreign price was reduced on April 12 from 13.65 cents, c.i.f., to 13.50 cents. Export demand has been quiet.

Zinc has gradually weakened during the last seven days, dropping from 6½ cents, St. Louis, to 6.40 cents. In fact, some offers were made April 13 as low as 6⅜ cents. Business has been a little larger than last week, but is still below normal. The statistics are not particularly reassuring, showing practically the same rate of production in March as in February; shipments were also at about the same rate as in February. April production should be markedly less, owing to smelter curtailments in late March. At present prices it is felt zinc is scraping bottom, as ore is only $42 a ton. Below this, production is likely to be curtailed.

American Zinc Institute's statistics, in tons of 2,000 lb., follow:

Stock, March 1	32,938
Produced	56,546
Shipped	53,205
Stock, March 31	36,279
Shipped from plant for export	5,098
Retorts operating, March 31	83,208

ELECTRIC RAILWAY MATERIAL PRICES—April 15, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.775
Lead, cents per lb.	7.25
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.75
Tin, Straits, cents per lb.	67.87
Aluminum, 98 or 99 per cent, cents per lb.	26.005
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.375
Somerset mine run, Boston	2.00
Pittsburgh mine run, Pittsburgh	2.175
Franklin, Ill., screenings, Chicago	2.50
Central, Ill., screenings, Chicago	2.00
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb.	3.95
Steel bars, cents per lb.	1.90
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	2.75
Sheet iron, galvanized (24 gage), cents per lb.	3.65
Galvanized barbed wire, cents per lb.	3.25
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.90
White lead in oil (100 lb. keg), cents per lb.	14.50
Turpentine (bbl. lots), per gal.	$0 71
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	14.875
Rubber-covered wire, No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, cents per lb.	16.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$130
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1 00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	10.75
Light copper, cents per lb.	9.25
Heavy yellow brass, cents per lb	6.75
Zinc, old scrap, cents per lb.	4.00
Lead, cents per lb. (heavy)	5.875
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	15.50
Rails (short), Chicago, gross ton	17.25
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.75

Gradual recession in prices in the St. Louis district has been the feature of the domestic lead market during the week. As early as April 8 sales were made at 6.95 cents and on April 13 the leading interest reduced its price to that level, the price on the latter date going as low as 6.90 cents. American Smelting & Refining Company has maintained its price all week at 7.25 cents, and scattering sales at 7.20 cents were offset by others that brought a small premium.

Tin buying on the part of consumers has been in moderate volume for May and June, with some for prompt delivery. The price tendency has been generally downward in the domestic market, though a 30 shilling rise in London on April 13 stiffened prices here, prompt Straits being sold at 68 cents.

New Trackwork Underway in Minneapolis

Work began this week on the 1927 program of the Minneapolis Street Railway, Minneapolis, Minn., covering improvements and extensions to cost $654,900. Improvements started with an extension of the Kenwood-25th Street line at the east end across the new bridge over the Mississippi river, making a new connection with St. Paul at the Ford Motor Company plant, where the Randolph Street line of the St. Paul City Railway ends. Double track will be laid on 50th street from Penn Avenue South, making connection at Bryant Avenue with the Bryant-Johnson line, including double tracking the line from Xerxes avenue to Penn; single track from 50th to 54th Streets on Penn Avenue, etc.

A. C. Godward city planning engineer, has been authorized to complete survey of the cost of extending the Franklin Avenue line east to connect with the Rondo-Maria line of the St. Paul City Railway to make a fourth through interurban.

Rolling Stock

Southwest Missouri Railroad, Webb City, Mo., has placed an order with the American Car Company, St. Louis, Mo., for one 50-ft. double-end passenger motor car.

Portland Electric Power Company, Portland, Ore., will place in service about May 15 eight new 33-passenger buses, costing approximately $90,000, according to W. H. Lines, vice-president. The equipment will be operated over the Ross Island Bridge to serve the Mount Scott district. The buses are being provided in accordance with the company's new franchise which stipulates better service for the outlying districts.

Fitchburg & Leominster Street Railway, Fitchburg, Mass., is repeating the order placed last fall with the Wason Manufacturing Company for four light-weight motor passenger cars. The four cars originally ordered in October, 1926, and placed in service on Jan. 1, 1927, proved so satisfactory that an order for four more cars of the same type was placed in February, 1927, for delivery in April. Specifications follow:

Seating capacity	40
Total weight	26,000 lb.
Bolster centers, length	17 ft. 8 in.
Length over all	36 ft. 10 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	10 ft. 11 in.
Body	Steel
Interior trim	Mahogany
Headlining	½-in. Agasote
Roof	Arch
Air brakes	General Electric
Fare boxes	Johnson
Headlights	Golden Glow, city type
Motors	General Electric 265, 35 hp., inside hung
Paint	Pratt & Lambert and Sherwin-Williams
Sanders	Air, Wason Company
Seats	J. G. Brill Company
Seating material	Leather
Trolley catches	Ohio Brass Company
Trolley base	Ohio Brass Company
Trolley wheels	Ohio Brass Company
Trucks	J. G. Brill Co. 177 Ex
Wheels	27-in. J. G. Brill Co. rolled steel

Trade Notes

O. M. Edwards Company, Syracuse, N. Y., announces the appointment of H. A. Cronmiller as Eastern representative of the company with offices at 412 Broadway, New York City. Mr. Cronmiller succeeds A. J. Hogan.

Canton Culvert & Silo Company, Canton, Ohio, has received an order from the government of Colombia, South America, for immediate shipment of 750 tons of "Acme" (Nestable) toncan iron corrugated culverts, to be used in highway construction in that country. This is believed to be the largest single order for corrugated culverts ever awarded to any corrugated culvert manufacturing company in the United States. It represents a shipment of 42 carloads.

General Electric Company announces the sale of the entire Sprague hoist business to the Shepard Electric Crane & Hoist Company, Montour Falls, N. Y. This includes the right to manufacture and sell Sprague electric hoists and winches as built and sold from 1903 to 1923 by the Sprague Electric Works of the General Electric Company and from 1923 to date by the General Electric Company.

L. B. Foster Company, distributor of steel rails and complete track equipment, has opened offices in the Illinois Merchants Bank Building, Chicago. Adequate warehouse and storage yard facilities have also been provided and plants for the housing of fabricating and reclaiming machinery are in process of erection, so that a complete service can be had, and material shipped, from this point. The Chicago office will be under the management of Reuben A. Foster, vice-president of the firm. The L. B. Foster Company has offices, plants and warehouses in Pittsburgh, Jersey City, Baltimore, Hamilton, Ohio, Roanoke, Virginia and Chicago.

Pittsburgh Testing Laboratory, New York, N. Y., announces the removal of its offices from 50 Church Street and its laboratory from 35 Sixth Avenue, to its new laboratory and offices at 72 Washington Street. The most improved types of accurate physical testing machines and chemical apparatus have been installed. The facilities have been greatly improved and the scope of service enlarged to serve better its clients. This company, with its main office in Pittsburgh, has branch offices in the principal cities of the United States and facilities for inspection and testing abroad.

John R. Hayward of Roanoke, Va., will on April 1 succeed Frank N. Grigg of Washington, D. C., as Southeastern railway sales manager of the Heywood-Wakefield Company. Mr. Grigg has represented the Heywood-Wakefield Company for many years and is now retiring because of his health.

R. H. Beaumont Company, Philadelphia, Pa., announces it has taken over the business of the American Manufacturing & Engineering Company, Kalamazoo, Mich. Products formerly manufactured by this company, including the American slack line cableway excavator, will now be manufactured by the R. H. Beaumont Company. The addition of the American slack line cableway excavator to the Beaumont line, which already includes the Beaumont LeClair cable drag scraper, completes a full line of equipment for the elevating and storing of sand, gravel, stone and kindred materials. The R. H. Beaumont Company will sell the complete system for this service, including the hoist.

New Advertising Literature

Sullivan Machinery Company, Chicago, Ill., has published new editions, enlarged and improved, of two of its bulletins on concrete breakers and on electric portable hoists. Second edition, 81-I, describes two types of tools, a 75-lb. or heavy-duty Buster and a 48-lb. light Buster. The bulletin is liberally illustrated to show different applications of concrete breakers. Second edition, 76-G, is a sixteen-page pamphlet describing Sullivan single and double drum, electric portable hoists. This also is liberally illustrated. Copies may be secured on application to the company at 122 South Michigan Avenue, Chicago.

J. G. Brill Company, Philadelphia, Pa., is mailing out an attractive folder giving operating statistics on cars furnished for the Warren & Jamestown Street Railway, Cumberland Traction Company, Lewistown & Reedsville Electric Railway and Milford & Oxford Street Railway. All the cars that are featured are of the light-weight modern type.

O. M. Edwards Company, Inc., Syracuse, N. Y., through its metal sash department is issuing a new folder describing the application of Edwards metal sash to modern bus bodies.

Carnegie Steel Company, Pittsburgh, Pa., has issued an attractive leather-bound book of 172 pages, giving dimensions and other information on Carnegie beam sections. The series of beams now placed on the market provide a series of shapes which combine sound engineering principles with practical improvements. The new beam sections are explained under the following captions: Contour Design, Web and Flange Ratio, Range of Sizes, Progressive Beam Designs and Improved Column Design.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, April 23, 1927 *Number* 17

History Was Made in Springfield, Mass. Last Week

SUCCESSFUL demonstration of the experimental worm-drive car built under the auspices of the Springfield Street Railway, Springfield, Mass., which was reported in last week's issue, has created a great deal of discussion among electric railway men. Many are enthusiastic regarding the possibilities of this new design. Others are frankly skeptical. Between these two groups lies the great majority of the industry, whose attitude may be properly described as one of watchful interest.

The performance of the experimental car exceeded every reasonable expectation. In judging the results of the demonstration account must be taken of the radical changes which were made from conventional design practice. These included not only the truck, axles and brakes but also many features of the control and miscellaneous devices on the car. Even the lines of the body were radically changed from customary practice. All of these factors must be considered in judging the significance of the Springfield demonstration.

The new car accelerated smoothly and rapidly. The automotive type brakes, with diaphragms mounted on the axles and with internal expanding shoes in brake drums bolted to the wheels, performed efficiently and entirely without noise. The spring suspension cradled the body nicely against rough track and low joints. Over special work the familiar clank and rattle was replaced by a not unpleasant metallic click.

From the standpoint of noise reduction, the car did not seem to live up entirely to what had been anticipated for this design. This was true particularly on the interior of the car. While there was a distinct reduction of street noise to a pedestrian on the adjacent sidewalk, there was a hum on the interior which increased in intensity as the car picked up speed.

Even in this respect, however, there seems little cause for disappointment on the part of those responsible for the new car. It must be remembered that the wheels were solid steel, with no deadening pads of rubber or other noise-absorbing material. A special deep-dished plate section was used to bring the tread under the axle bearings, and this had the effect of making the wheel into a bell rolling on its edge. The sound of the flange rubbing in the rail groove was consequently amplified. Furthermore, the motors used were an adaptation of vehicle motors. They were wound for 300 volts and permanently connected in series for operation on trolley voltage. Some of those present during the demonstration were inclined to attribute part of the hum to the motors. If that is so, further development may be expected to show considerable improvement.

Some of those who are inclined to be skeptical regarding the possibilities of the worm-drive car contend that there has been no actual reduction in unsprung weight in comparison with modern types of conventional truck and motor assemblies. Here again it is important that premature judgment be withheld. It is to be expected that the axle manufacturer played safe in these first experimental equipments. In addition, the axles used are a direct application of heavy automotive vehicle practice. As the requirements for street railway conditions are better understood further refinement of the design may reasonably be expected. There is also another type of shaft-drive construction for street cars which is still untried in this country under modern conditions. That is the use of bevel-gear drive instead of a worm. Whether bevel-gear construction would have any advantages in weight reduction over the worm is hard to determine at this early stage in development.

Will the new type of construction stand up under the severe conditions encountered in street car operation? Nobody knows. Will the maintenance of worm-drive axles, roller bearings and differentials prove excessive in comparison with conventional truck construction? Nobody knows. But the industry does know that a design which materially reduces noise, which may be developed to decrease the pounding on expensive special work and joints and which gives the passenger a smooth and comfortable ride is very much to be desired if it will stand up in service. It is safe to say that equipment maintenance could be permitted to increase considerably if it resulted in decreased track maintenance. It would be a good investment if the change helped to eliminate from the public mind the idea that the electric railway is obsolete and on the way out.

The Springfield Street Railway is entitled to a great deal of credit for taking the brunt of responsibility in pioneering an improved type car. It is perhaps a reflection on the industry as a whole that the men on this comparatively small property, while going through the throes of a change in ownership, had the courage to spend good money in developing a car which they felt was needed. The benefit to be derived by Springfield is small in comparison to the possibilities which are opened up to the rest of the industry—both manufacturers and operators. Regardless of the final verdict on this first shaft-drive car, electric railway history was made in Springfield last week. The men who backed their convictions with courage to go ahead are entitled to frank commendation by every one who has faith in the electric railway industry.

Get Out the Broom and Dust Cloth

EVERYWHERE over this broad land of ours windows are being raised; blankets are being hung on wash lines; every room in the house is topsy-turvy; the male members of the household are told that they are in the way; their favorite pipes must be excavated from the ash barrel. In short, en masse the housewives of the nation are engaged in spring cleaning.

As the women generally are the most practical of the human race, we should follow their example, bearing in mind that around May 1 the industry usually indulges in clean-up week. It is a fearsome job. The long winter months seem to take a malicious delight in making unsightly every nook and cranny of shops, office buildings, stations, street cars and carhouses. Winter's greatest ally in this respect is the heating plant, whose function seems to be airily to deposit soot and grime on windows, curtains, in bins and corners. The principal assistant of the heating plant is cold weather, which continually urges man to hibernate.

The clinging snow has stopped the scythe and grub hook that ordinarily we would employ on the right-of-way. Sleet and rain have washed off last summer's paint. Slush has left its mark on the underframes of our rolling stock. The winds of November and March have made leaf storehouses of our interurban stations. In the corners of our cars, especially near the sand containers, the reverend dirt lays down the gauntlet of battle. The cars may have been cleaned each day, but we must remember they were cleaned in a cold carhouse.

But what's the use of arguing when our duty is plainly laid out for us? Nature is cleaning up. Man is coming forth attired in new raiment. The home is feeling the merciless swish of brush and dust cloth. So it's plainly our duty to get out the brush and dust cloth, soap and water bucket, grub hooks and pruning knife. Roll up your sleeves and get to it.

Relief of Traffic Congestion Demands Action, Not Words

REALIZATION of the seriousness of the transportation problem in our large cities is brought home by the address of J. Rowland Bibbins before the Chicago traffic meeting, published in this issue. Unless there is co-ordination of all forms of local transport so as to obtain the greatest good for the greatest number, all of the residents are bound to suffer, and suffer greatly.

Mr. Bibbins points out that the use of streets indiscriminately for all classes of traffic can lead only to confusion. It is not generally known that freight traffic is being carried on city streets to so great an extent as seriously to hamper the movements of passenger vehicles, but those who have given the matter careful consideration are aware that this is so. Then, too, use of the streets for loading and unloading these same freight vehicles reduces the capacity of the streets for those moving to a great degree. Add to this the parking of passenger vehicles, and it is small wonder that free circulation of vehicles is next to impossible.

Heed should be given to the conclusion that it is not enough to plan for the future. It will take years and millions of dollars to carry through projects involving extensive street widening, double-decking, subway construction and the like. In the meanwhile every effort should be made to get maximum use of the existing streets, which Mr. Bibbins has found out are by actual count often carrying only from 25 to 50 per cent of their possible capacity. While there are several alternatives to the proposals for increasing street capacity presented in the article, it will be necessary to make some decisions in the immediate future and to carry them through, for every day of delay adds its quota to the congestion and makes the solution of the problem that much more difficult.

Corporate Readjustment Favorable to Future Financing

THINGS are happening in the electric railway financial world. This the record of events shows. Even considered singly they are significant, but a week's news that spreads on the pages of history the details of the voluntary readjustment of the financial structure of the Grand Rapids Railway, refunding operations in Denver and Cincinnati and the new Boston issue surely contains particulars worth pondering.

The railway at Grand Rapids helped materially to blaze the way in new things mechanical with new cars and in its efforts more intensively to sell transportation. Now it has come to the front again with a scheme for strengthening its financial structure. Financial papers refer to the plan as a reorganization. That is hardly the correct designation. It is a voluntary readjustment, the details have been given in the JOURNAL, whereas the term reorganization connotes something that is not voluntary.

It is the philosophy behind this move rather than the details that is of interest to the reader. The readjustment is dictated because of the large floating indebtedness of the company and the lack of a medium for doing any financing other than by the sale of first mortgage bonds. The feeling is that in view of the company's present condition, bonds cannot be issued in sufficient amount or be sold at advantageous prices.

The cause of the present floating indebtedness dates back to June 1, 1919, when $3,700,000 three-year bonds became due. These bonds were intended to refund long term 5 per cent bonds issued in 1900. The net increase in the debt of the company junior to the first mortgage bonds is $1,446,199, represented by $700,000 of 7 per cent gold debentures, $198,045 of car trust notes, $69,977 in increased amount of paving assessments not due, $58,218 of increased accounts payable, $245,458 of advances payable and $174,500 of bank loans.

The payments on the first mortgage bonds and on the car trust notes constitute cash requirements of about $178,000 a year. This is contrasted with payments of $140,000 under the plan of readjustment. Not only that, but it is anticipated the consummation of the plan will enable the company again to sell its first mortgage bonds at prices more nearly approaching par. In fact, an agreement for the sale of $200,000 of the first mortgage bonds has been made contingent upon the readjustment plan being declared operative. The sale of preferred stock locally may even be in prospect based in part on the results of the readjustment and the fact that for the twelve months ended Feb. 28, 1926, the gross income of the company increased $97,263, attributed largely to the reduction in operating expenses resulting from the use of the new Grand Rapids type of one-man rail coaches placed in service on June 30, 1926.

Conditions in Money Market Have Made Refunding Easy

IT IS not such a far cry from the readjustment in Grand Rapids to the sale by the Boston Elevated Railway of ten-year 5 per cent bonds at 103¾ and interest to yield 4.90 per cent and the sale by the Cincinnati Street Railway of 5½ per cent first mortgage gold bonds at 100 and accrued interest to yield 5½ per cent. It might be objected that both of these companies are operating under terms and conditions unduly favorable to them. This is, of course, in part the explanation for the ability of these railways to finance at the favorable prices at which these securities are being marketed, but the entire explanation is not to be found in these operating contracts. Neither is the explanation for the favorable financing to be found in the steady rise of bond prices. That tendency, however, is propitious for all borrowers with a balance sheet that will withstand the scrutiny of the bankers. Of particular interest, however, is the feeling that bond prices generally are likely to continue at high levels for some time to come. This is forecast not only by the U. S. Treasury operations but by comparatively easy money, large and steadily mounting gold reserves with a downward trend in commodity prices. It does not appear to be going too far to predict that as bond prices continue to advance investors will more and more turn to the better grade of electric railway securities for yields which they feel their funds should command. And in that event companies like the ones in Cincinnati, Boston and Grand Rapids, to mention just a few that have set their houses in order, will be in the best condition to borrow at favorable rates.

Cast Thy Bread Upon the Waters— It May Return Next Day

RECENTLY the local superintendent was taking a visitor over the routes to show how nicely his trolley and motor-bus services were being dovetailed. The outermost part of the area had been reached, possibly a half mile or more from a house, when a limousine was seen careened in the roadside ditch. Promptly he stopped his own car at the scene of the trouble and found that the chauffeur and woman rider were in a dilemma regarding what to do next. The lady did not care to be left alone on the open road while the chauffeur trudged for help. On the other hand, neither car carried towing equipment strong enough to drag the limousine out of the ditch.

The superintendent was equal to the occasion. He told the lady that he would hustle back to town at once and send his company's wrecking car to her aid with the compliments of the management. So promised, so done. The visitor ventured to praise him for his courtesy, but he said it was all in the day's work. It was bread cast upon the waters, to return, perhaps, after many days.

"Came dawn and a new day," as they say in the movies. With the day came the postman and with the postman a letter in fashionable, feminine hand. It was from the lady whose car had been retrieved from the ditch. And who was she? None other than a relative of one of the most influential men of the town. She had made no secret of the fact that her friendly Samaritan was the chief of the local transportation concern and was satisfied that the corporation he represented must be a human and worthy one. Of such is the Kingdom of Good Public Relations.

Tax Burdens for Our Stepbrothers and Possibly Us

OUT in Ohio the tax leviers are at it again. As usual, their prey is the public utilities. The upper branch of the Ohio Legislature has passed a bill to increase the excise tax on intrastate gross receipts of several of the public utilities from 1.2 per cent to 1.5 per cent on the dollar. Action by the House is expected soon.

Here is what the measure means to certain public utilities in the Buckeye State, according to a recent speech made by Senator Atlee Pomerene before the committee on taxation of the Ohio body:

"It is estimated that their gross receipts (water, gas, heating, telephone and electric light utilities, etc.) for the coming year will be about 7.6 per cent in excess of what they were last year. For the year 1930, carrying out these estimates of increase in accordance with the general increase during the past several years, it will be found that under the 1.2 per cent levy the increase in state revenue from this source will be about 93.5 per cent. And for 1935, assuming that the utilities' rate of growth during the past ten years is continued during the next ten years, the sum of money which the utilities must pay into the state treasury under the 1.2 levy will be increased 423.5 per cent. If the proposed 25 per cent increase in the excise tax be imposed by raising the rate from 1.2 to 1.5 cents on the dollar, the present year's increase in money which the utilities would have to pay in excise tax would amount to 34.5 per cent over last year. In 1930 the increase would be 141.9 per cent, and in 1935 it would be 554.5.

All of which, summed up, resolves itself into the fact that if the 1.5 per cent rate becomes effective, the utilities, which in 1925 under the present rate paid $2,413,000 in round figures, will pay to the tune of $15,797,000 for 1935.

Bearing these figures in mind, there are found, in addition, the following interesting sidelights:

1. While the increase in the total state tax valuation (1910-1925) was 410 per cent and on all utilities amounted to 481 per cent, the increase on electric light and power, gas and telephone industries amounted to 807 per cent.

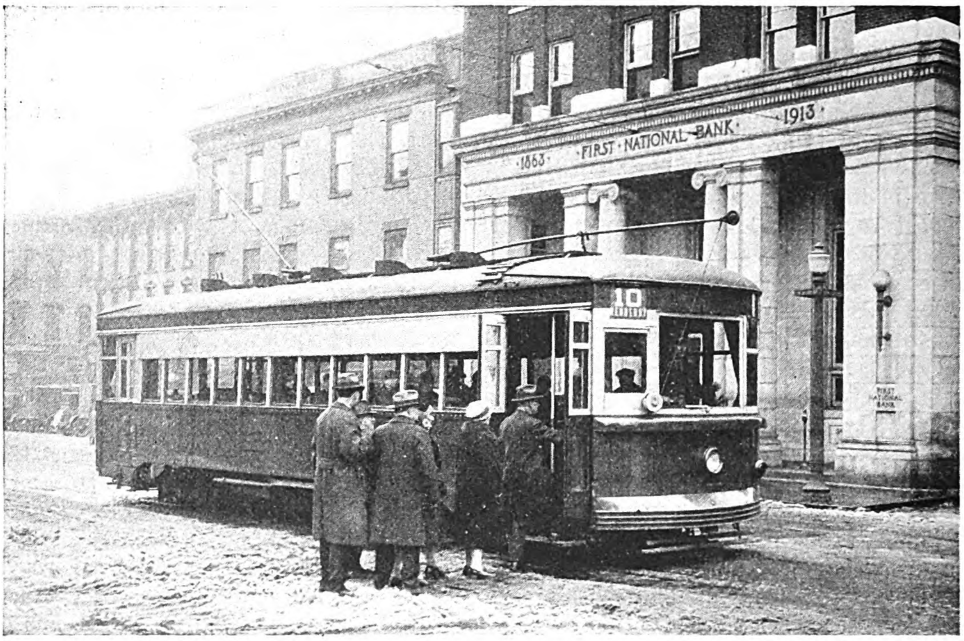
2. The total value of credit in round numbers included mortgages, accounts receivable, notes, bonds, etc., listed for taxation in the entire state for 1924 was only $366,000,000; money on deposit and listed for taxation totaled $269,000,000, whereas an examination of the bank statement reveals that the total amount of money on deposit throughout the state was about ten times that amount.

3. The total tax, state, local and federal, paid by electric light and power, gas and electric railway companies in Ohio has increased 31.06 per cent in six years.

4. The funded debt of the Ohio counties and other political subdivisions has increased 385 per cent since 1910.

Is it necessary to go any further? Are we not presented with the old pussyfooting practices of making the other fellow pay; with burdening the ultimate consumer with the hocus-pocus of robbing Peter to pay Paul? And lastly, another orgy of bad issues, which are not backed by solid financial practice.

What is apparently in store in the way of further burdens by our stepbrothers may be imposed on us at any minute. Because the electric railway field is not the sufferer it is no reason to relax our vigilance.



Passengers entering one of the five new cars recently delivered to the Williamsport Passenger Railway from the Philadelphia works of the J. G. Brill Company. The group shown in the picture is the Citizens' Traction Committee of Williamsport, inspecting the cars before they were placed in service.

Williamsport Rehabilitates Following Citizens' Recommendations

Attractive new cars are provided in Pennsylvania city, following constructive report by citizens' committee and co-operative attitude between city and railway. Extensive rehabilitation program undertaken. Company given increased fare and relief from paving

FOLLOWING several months of intensive study, the traction investigation committee, a group of representative citizens appointed by the Mayor of Williamsport, Pa., some time ago found that the transportation situation in the city needed not only an improvement of the physical properties but an improvement of the laws that govern the corporation. The committee was equally as frank in recommending one as the other.

So pertinent were the recommendations that immediate action was obtained. Shortly after the report was submitted, the city removed the obligation to pave within the track areas. The company has also started an extensive rehabilitation program requiring large immediate expenditures. This includes the erection of a new carhouse, the purchase of new cars, the rehabilitation of several other cars and extensive reconstruction of certain tracks.

The four underlying railway companies have been consolidated into the new Williamsport Railways Company in compliance with one of the recommendations. The fare increase recommended was held up voluntarily by the company until its share of the program was well under way. Application was filed with the Public Service Commission for the increase. This was granted and went into effect on March 1, 1927.

Upon completion of the new carhouse and shop an "open house" was held on Jan. 22, 1927. More than 2,000 citizens visited the new shops of the company and employees explained the many features of the building and officers told of the change that has taken place in the entire transportation situation of Williamsport. In the evening a dinner was given by General Manager L. W. Heath to presidents and other officers of the various local clubs and associations of the city. The work of the traction investigation committee was reviewed and a report of the progress made during the first year was presented.

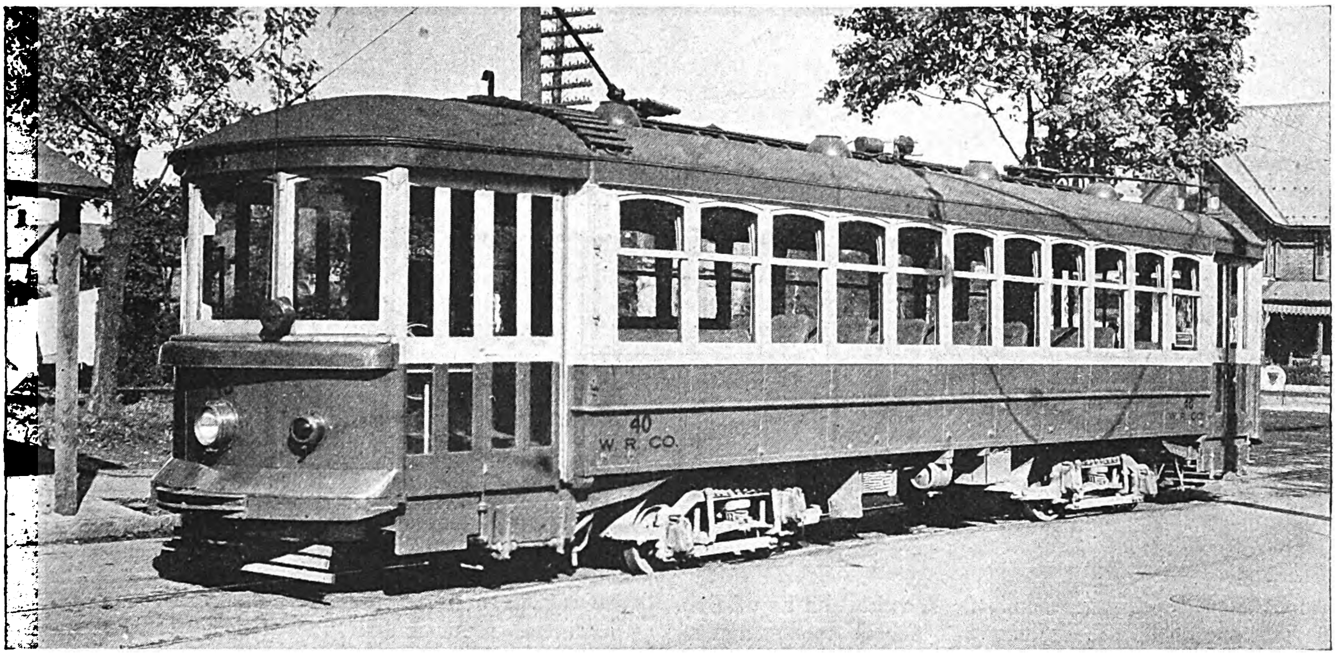
THE COMMITTEE'S FINDINGS

Six representative business men were appointed by the Mayor of Williamsport in July, 1925, to investigate the traction situation. The committee was formed at the request of the four operating companies that such a body be appointed to investigate, advise and if possible to offer some solution of the problem that would permit the continuance of the service so that they could earn a fair profit.

The findings of the committee herewith presented in abstract are of interest in that they show a comprehensive understanding of the situation.

Tracks in certain sections of the city were found in excellent condition, but in others they were in such poor condition that it was held they should be immediately replaced. The carhouse on West Fourth Street was found to be inadequate and in bad physical condition. Construction of a new carhouse was recommended.

Of the 37 cars owned, some were of a type that could



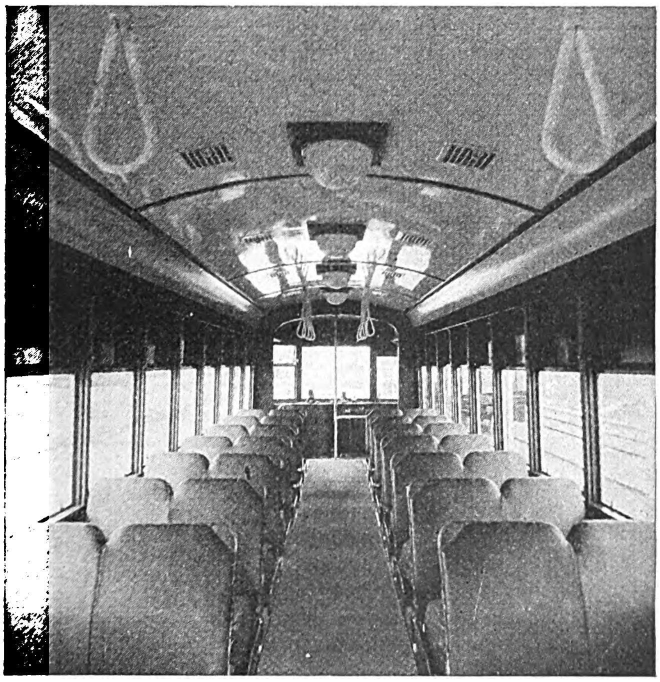
The exterior of one of the 32 cars rehabilitated in Williamsport. Dash floodlighting is in conformity with the new cars recently purchased

be rebuilt and modernized. Five of the old cars were in very poor condition and it was recommended that they be scrapped and written off. Others were good only for extra service and could not be economically operated on regular schedules. The committee also found that the major portion of the trolley wire and feeder system was in good condition.

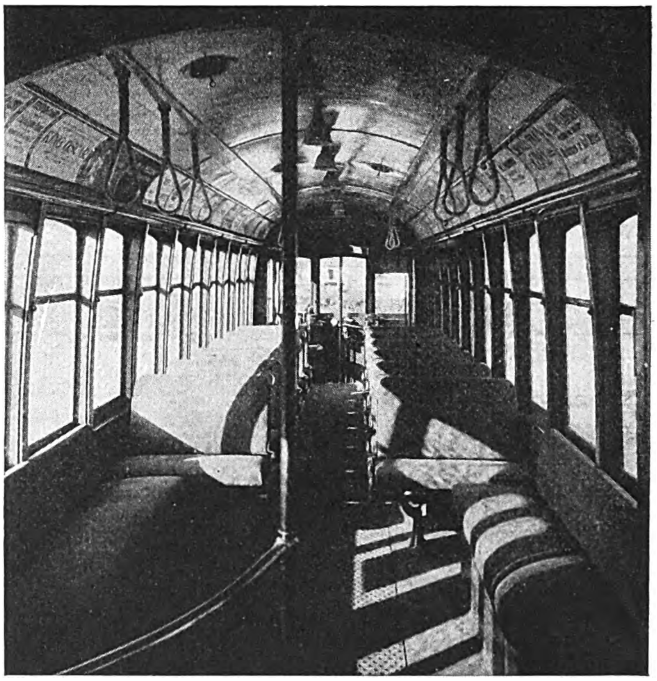
Largely due to automobile competition, the number of riders has decreased steadily during the last five years.

The statement of consolidated income shown elsewhere indicates a general falling off in net returns, so that the rate of return on the investment had decreased gradually from 4.7 per cent in 1920 to 1.3 per cent for the first few months of 1925, according to the committee's report. It is obvious that with this low rate of return the street railway system could not continue to grow and properly serve the city of Williamsport without a substantial increase in gross revenue. For this reason, the committee recommended an 8-cent cash fare, with two tokens for 15 cents and a $1.25 weekly pass. It is explained that the company originally took the position that a 10-cent cash fare was necessary with the same ticket and pass rates, but agreed to a trial on the basis of the committee's recommendations.

The committee compared several appraisals of the company's properties made during recent years and

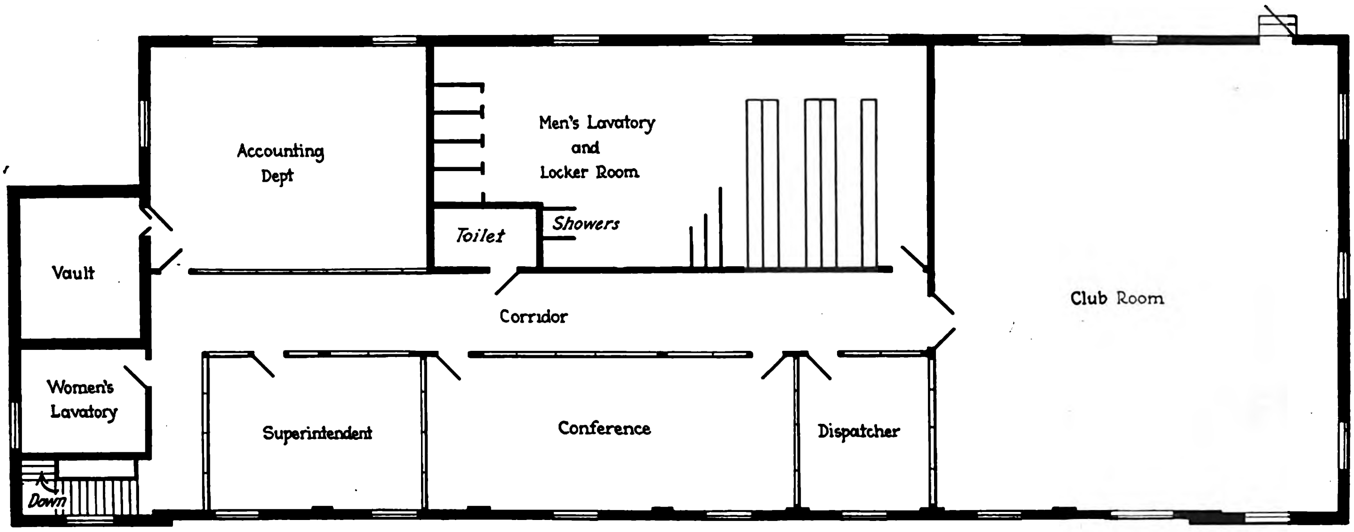


From the interior of one of Williamsport's new cars both passengers and motorman are afforded an excellent view through the large vestibule window



Many of the old cars in Williamsport have been rehabilitated to conform in general design to the new cars purchased

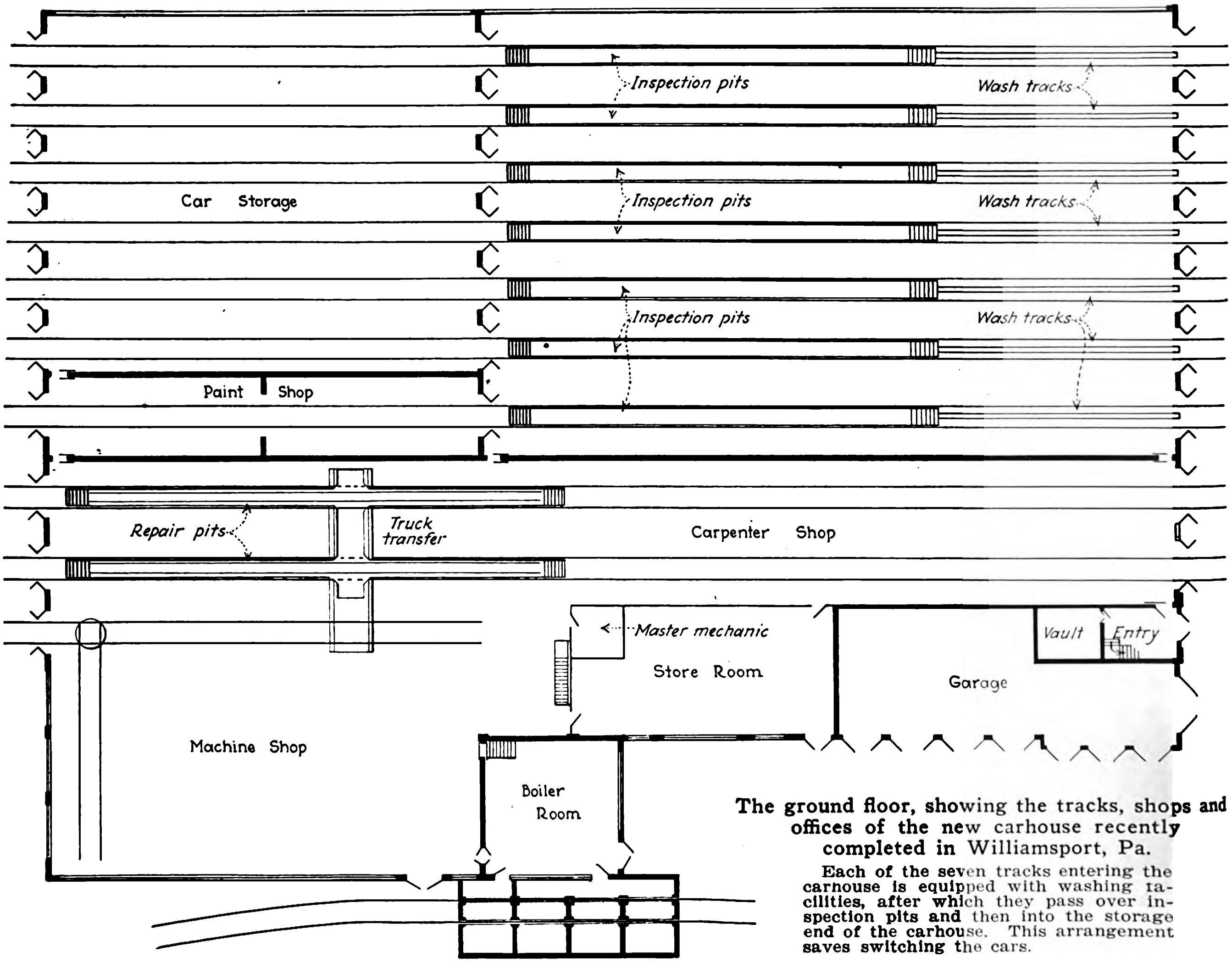
All platform equipment is housed in mahogany cabinets on the new cars. The seats are of full spring construction and covered with genuine leather. Note the absence of bell cords and register rods.


Accounting Dept
Men's Lavatory and Locker Room
Vault
Toilet
Showers
Corridor
Club Room
Women's Lavatory
Superintendent
Conference
Dispatcher
Down

On the second floor of the new carhouse are the company's offices and employees' club room, as shown by the plans

found them in close agreement. A valuation as of Dec. 31, 1924, totaling $1,533,023 was finally determined as a basis on which a fair return should be earned. The committee further investigated the cost of power purchased from the Pennsylvania Light & Power Company and found this to be at approximately the same rate as paid by other railway properties under similar conditions throughout the state of Pennsylvania. A further finding was to the effect that the street railway system was being operated economically and that no substantial reduction in operating expenses could be made.

To provide adequate service, the committee recommended the immediate purchase of five new cars, the rehabilitation of 32 others, numerous routing and track changes, and the construction of a new carhouse, all totaling $245,770. It held that other items for track reconstruction and extensions, amounting to


Inspection pits
Wash tracks
Inspection pits
Car Storage
Wash tracks
Inspection pits
Wash tracks
Paint Shop
Repair pits
Truck transfer
Carpenter Shop
Master mechanic
Store Room
Vault
Entry
Garage
Machine Shop
Boiler Room

The ground floor, showing the tracks, shops and offices of the new carhouse recently completed in Williamsport, Pa.

Each of the seven tracks entering the carhouse is equipped with washing facilities, after which they pass over inspection pits and then into the storage end of the carhouse. This arrangement saves switching the cars.

Williamsport Citizens' Committee makes possible paving relief granted in ordinance of Dec. 30, 1926.

SECTION 3. The grantee shall repair any damage to street paving within its roadbed, as hereafter in this section defined, caused by the construction, maintenance or operation of its street railway, and in such cases shall restore and replace such street pavement so damaged in good order and repair. Whenever any street or streets, upon which the tracks of the grantee are laid or shall hereafter be laid, shall be paved, repaved or repaired, the additional cost of such paving, repaving or repairing occasioned by the existence of such tracks on such streets shall be paid by the grantee. Such additional cost shall be deemed to be the difference between the cost per square yard or other unit of paving, repaving or repairing within the roadbed of the grantee and the cost of a similar unit outside of said roadbed. The term roadbed, as herein used, shall mean that portion of the street between the rails of each track and for such distance outside of the rails as the ties under the rails shall extend beyond the rails. The grantee shall have the option of doing the work within the limits of its roadbed in the same manner and with the same material as is used in other portions of a street being paved, repaved or repaired, or in such manner and with such materials as shall be agreed upon with the City Council, and for doing such work the grantee shall accept from the city, as full payment for such work, such sum as will equal the cost of paving, repaving or repairing in the same manner an equivalent area outside of the grantee's roadbed. The snow and ice removed from grantee's tracks, and constituting an interference with public travel, shall be removed by the grantee.

$69,000, should immediately follow, and that within the course of the next five to ten years additional expenditures totaling $193,000 will probably have to be made.

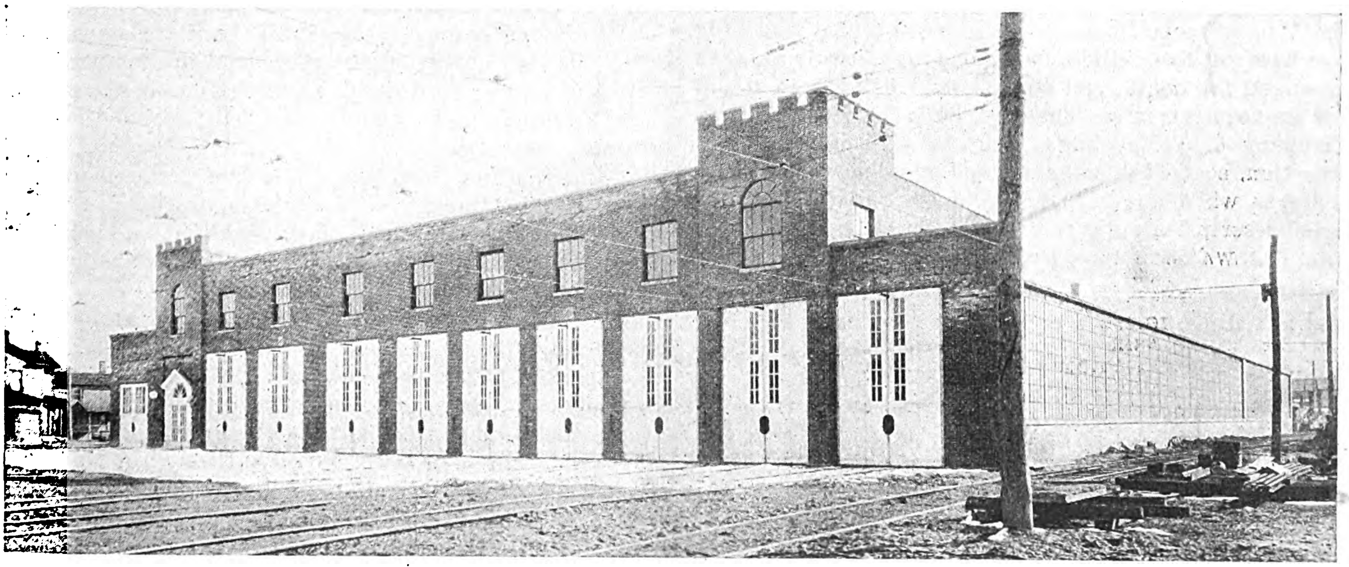
At the time the report was presented the local street railway companies paid a city tax of $50 annually for each car operated. Competing transportation mediums pay no such tax and therefore it was recommended that this burden should be reduced to $1 per car per year. The committee also recommended that the company be relieved of the paving burden which exists today as a heritage of horse car operation.

BUSES NOT CONSIDERED FEASIBLE AS SUBSTITUTE

Motor buses for transportation service in Williamsport were carefully considered as a substitute for trolley cars. The committee agreed that the fare under such conditions would have to be at least 10 cents. It felt that it would be impracticable to operate buses outside of the paved street areas, and that in the winter months, because of deep snows, such service would not be as reliable as car service. If buses were used, it held many large residential sections would be left without common-carrier transportation, which would restrain city development. The downtown streets in Willimsport are fairly congested with traffic at the present time and with the substitution of buses for street cars this condition would be greatly aggravated, according to the report, as several buses would be required for each street car replaced. Four buses are now operated by the railway company as a supplement to its rail service.

The committee concluded this portion of the study by strongly recommending the continuance of street railway service with the additions and improvements recommended. No public benefit was found in the operation of four separate street railway companies, and the necessary ordinances to provide a suitable working agreement for a new company, consolidating all of the four companies, were recommended.

The wages paid conductors and motormen on the local



Modern carhouse, shop and office recently completed in Williamsport, Pa. Considerable attention and expense were devoted to architectural design

A SIGN OF PROGRESS
WMSPORT RAILWAYS CO.

Part of the track reconstruction program under way following recommendations of the Williamsport Traction Committee that will extend over several years

railways were below what they should be, in the opinion of the committee, and an increase of 4 cents per hour was recommended.

Emphasis was laid on the fact that the operation of a street railway system is a mutual matter between the city served and the company. The city cannot grow without good transportation and the company cannot live without earning enough properly to maintain its facilities and to pay interest on its securities. Every recommendation was strongly urged by the investigating committee as necessary to provide good service.

The report as submitted was accepted by the Mayor, the City Council and also by the Public Service Commission of the Commonwealth of Pennsylvania. Shortly after its submission, the City Council passed an ordinance relieving the companies from the paving burden. Plans were immediately formulated by the companies to carry out their share of the recommendations. The new carhouse and shop has since been completed. Five cars were ordered last year and were delivered to the property during December and much of the recommended reconstruction work on the tracks and other property is under way.

Five Attractive Cars Purchased to Improve Service

After careful consideration of the factors involved, the Williamsport Passenger Railway decided upon the purchase of five light-weight, one-man, two-man cars arranged for double-end operation as being best suited for its requirements. The cars, built by the J. G. Brill Company of Philadelphia, Pa., are of semi-steel construction, seat 44 passengers, and combine several new features which make them stand out prominently. A brief description appeared in the Jan. 8 issue of Electric Railway Journal, page 103.

PRINCIPAL WEIGHTS AND DIMENSIONS OF FIVE NEW CARS PURCHASED BY WILLIAMSPORT PASSENGER RAILWAY FROM J. G. BRILL COMPANY

Weights:	
Car body	19,460 lb.
Trucks	9,600 lb.
Equipment	9,820 lb.
Length over all	42 ft. 2 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	10 ft. 10½ in.
Truck centers	19 ft. 8 in.
Truck wheelbase	5 ft. 4 in.
Wheels	26 in. diameter
Seating capacity	44

A bright and attractive color combination was used, consisting of a golden orange body with vestibule, letterboard, window sash and posts finished in cream. This combination of colors harmonizes well with the green roof and black trucks. Dull mahogany interior finish is used with an agasote headlining finished in ivory with trimming of Valdura red and tan enamel.

The Brill No. 201-B seats give the appearance of individual cushions and backs. They are of heavy upholstered construction, with deep spring cushions, padded backs, and are covered with genuine leather. With a width of 36 in. and a 30 in. spacing between seats comfortable riding space for two passengers is insured. The cars have seven transverse seats on each side and four longitudinal seats, one in each corner, all finished alike. The floors of wood are double on both sides of the 30-in. aisle. Within the aisle area, a single thickness of flooring is used with a flexible punched leather mat constructed in two pieces that extends the full length of the car body in the recess.

Instead of glass in the upper sash, Haskelite panels covered with metal on the outside and wood inside are used. The interior is finished to match the balance of the wood trim and the outsides of the panels are painted the color of the sash. With this arrangement, the use of curtains was considered unnecessary.

Thermostatic control of the fourteen cross seat heaters manufactured by the Railway Utility Company is used, the thermostat being set to hold the temperature between 55 and 60 deg. F. when the outside temperature is lower. Individually controlled vestibule heaters are also installed.

A combination electric tail and stop light, manufactured by the Electric Service Supplies Company, is used in conjunction with a dash floodlight on each end. This stop light shows red when the brakes are applied and the car is coming to a stop.

The four-part, two section, air-operated folding doors and folding steps provide an easy unobstructed exit and entrance. The doors at the right of the motorman are operated from the brake valve through Safety Car Equipment Company's ball check engine, and the rear door by means of a selective valve through a National Pneumatic Company engine. All rear doors are interlocked with the air brake and are balanced, during an emergency brake application, so that they may be opened by hand.

Interior illumination is provided by five Electric Service Supplies Company compensating dome lights, installed on the center line of the ceiling, and equipped with 94-watt lamps. The compensating panels are located to permit of easy access and ready inspection.

Four Westinghouse 510-A motors and control are used with Westinghouse brakes and General Electric air compressor. Trucks are Brill light-weight type 177-E-1.

The motorman's front vestibule sash is of unusual width to give clear vision. It is hinged at the top and carried on brackets so that it may be tilted out like an automobile windshield. The platform apparatus is all inclosed in a mahogany finished cabinet so that no parts are exposed except the controller handle, air valve and gauge. An upholstered seat with adjustable back is provided for the operator. A recess in the center of the cabinet gives the operator leg room so that his position is comfortable and all operating controls are within convenient reach.

By the installation of mirrors within the vestibules on the frieze board, and outside of the vestibules on the corner post, a clear view of the interior and the rear step is obtained at all times. The motorman's hand-operated window cleaner affords a means of providing him with good vision under the most severe weather conditions.

NEW CARHOUSE AND SHOP COMPLETED

The site selected for the new carhouse and shop is in a well built up part of the city, and attention was given to the architecture so that it would blend well with surrounding buildings. The building as constructed is of two stories, steel frame, red brick and art stone trim, with steel frame windows extending the entire length on each side so that ample light is insured. It is 260 ft. long by 200 ft. wide and has a storage capacity for 45 cars in addition to shop and servicing areas.

The first floor is divided by a fire wall extending the full length of the building. On one side are located the wash tracks, inspection pits, paint shop, and storage space. On the other side is the carpenter shop, truck and machine shops, store room, garage, master mechanic's office, boiler room, and store room.

Seven inspection pits are provided, and each track on the West Third Street side is provided with car washing facilities. It is planned to wash cars every three days. After each washing they are run over the pits and inspected. These pits are heated by direct radiation, which will help in the drying process as the cars stand over them during winter months. The interiors of the cars are cleaned by the washing and vacuum process. The pits are well illuminated to facilitate the inspection and light repair work.

Two cars can be placed in the paint shop at once and closed off from the outside, or by means of the center fire door either side of the shop can be isolated from the other.

Heating is by hot air from the unit heater system, each unit being equipped with motor and fan for passing the air through the steam coils of each heater. The temperature is regulated by a thermostat.

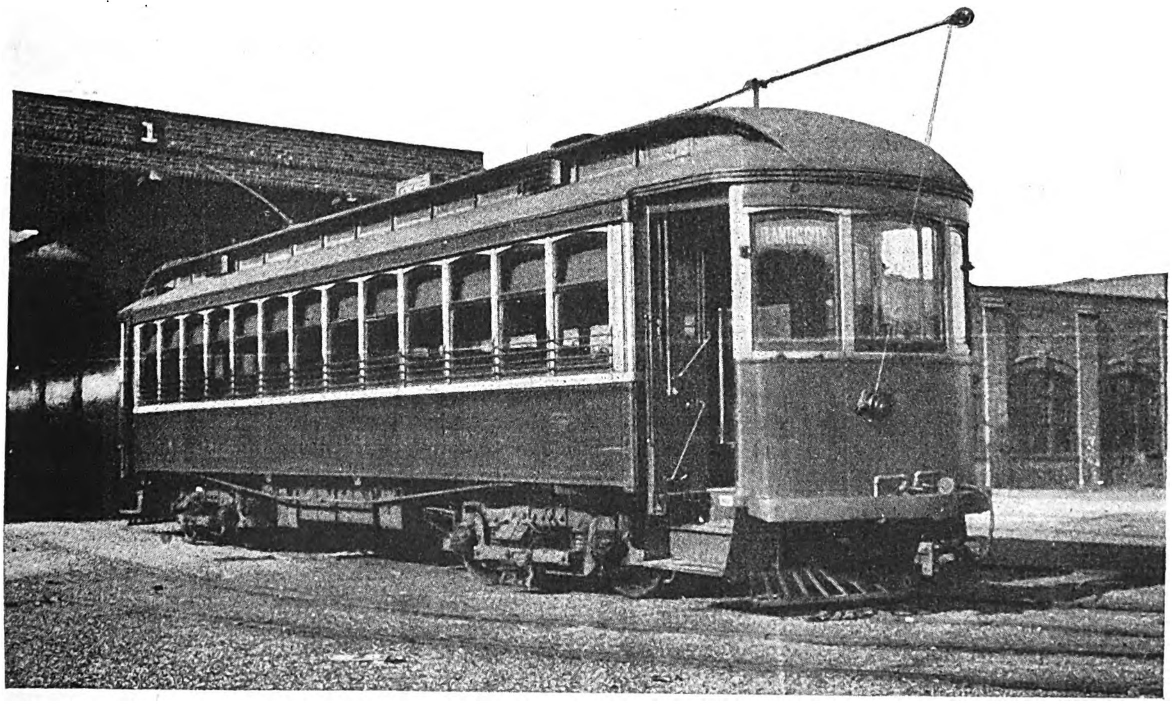
On the second floor of the carhouse are the offices of the company and a club room for the employees.

Cars Rebuilt for "Shore Fast Line"

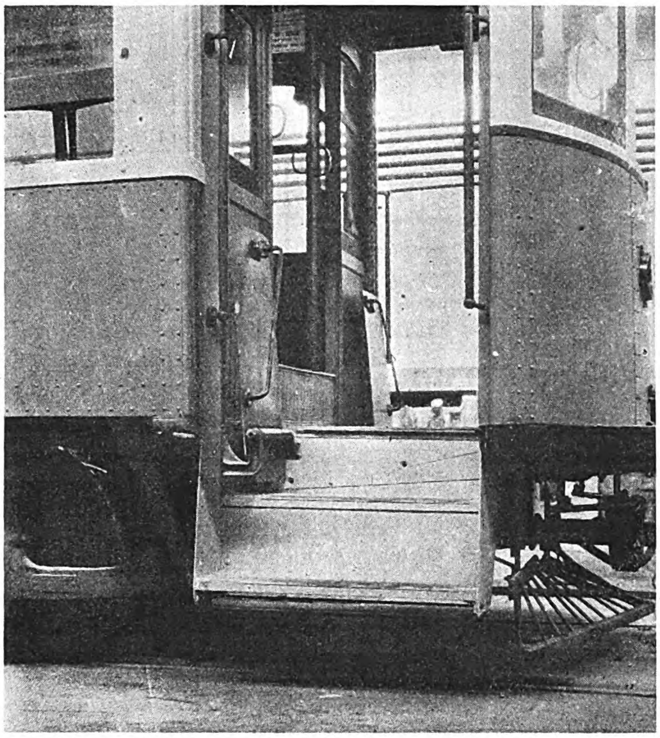
Improved Appearance and Greater Passenger Comfort Have Resulted from Reconstruction of Rolling Stock on the Atlantic City & Shore Railroad

DURING the past several months the cars of the Atlantic City & Shore Railroad, Atlantic City, N. J., have been undergoing thorough overhauling and refitting. Changes have been made to increase the comfort of the passenger, reduce noise and improve the appearance of the car, inside and out.

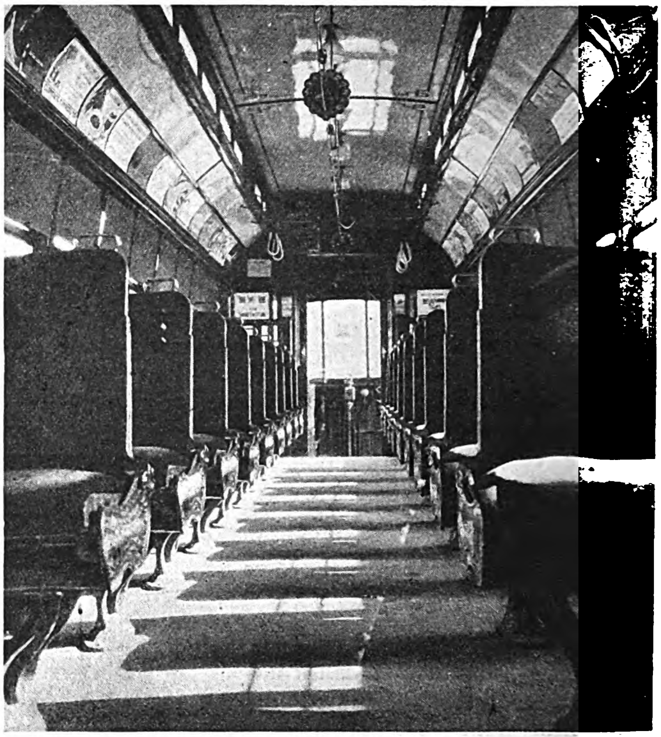
Plush seats have replaced the cane seats formerly used. This was done by installing new seat covering on top of the old rattan. The process consisted of placing,



High-speed, multiple-unit cars of the "Shore Fast Line" have been improved in appearance by the installation of sheet steel over the old wood side sheathing



Installation of drop steps in place of fixed wood steps has reduced accidents by eliminating projection and has made passenger ingress and egress easier



Plush-covered seats and magnesite flooring have improved the appearance of the car interior. The ceiling is white with gold ornamentation

in order, a ⅝-in. layer of felt, a 1-in. layer of woven hair, a layer of cotton and one of 16-oz. duck. On the outside standard Pennsylvania Railroad plush was used. New plain green pantasote curtains have been installed.

The ceilings are white with gold ornamentation. Cherry woodwork inside the car has been thoroughly cleaned and freshened up. Sash in the monitor deck has been sealed and Garland ventilators installed.

Over the old wood floor a new flooring of magnesite has been laid. This is ¾ in. thick, laid on a foundation of ¾-in.-mesh chicken wire. Two transverse and two longitudinal expansion joints have been provided. In this process the old trapdoors have been permanently closed, and work on the motors and trucks must now be done by raising the car body.

STEPS BROUGHT WITHIN BODY LINES

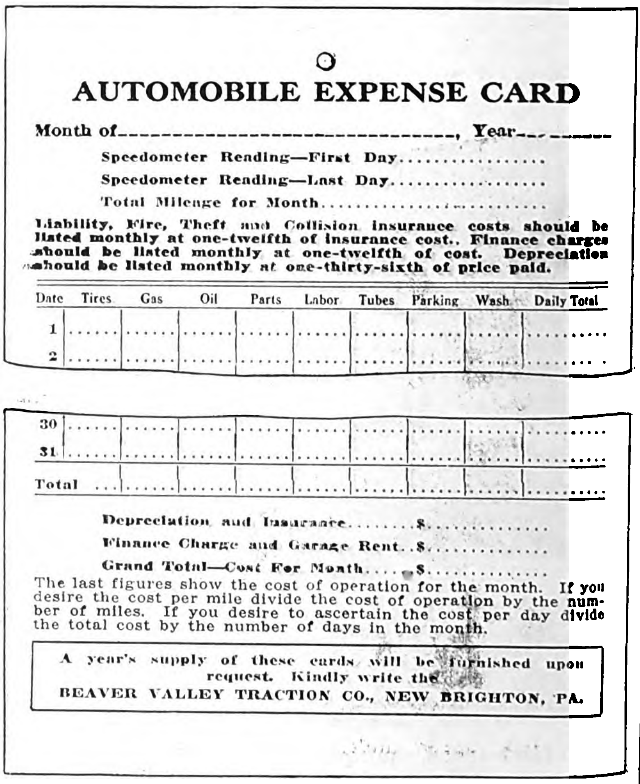
On the platforms O. M. Edwards drop steps have replaced the old fixed wood steps. This has made it possible to bring the steps within the lines of the car body and has reduced the number of accidents as well as made passenger entrance and exit easier. In the process of installing these drop steps it was necessary to remove the outside platform knees. The center knees were therefore reinforced with 4-in. x 4-in. x ½-in. steel tees extending from the bolster to the bumper and anchored to the end sill.

On the outside of the car No. 16 sheet steel has been placed directly over the old wood sheathing, with four panels on each side. Sheet steel also has been used to cover the old wood dashers.

Altogether about 1,000 lb. has been added to the weight of each car. This is believed by the management to be unobjectionable because the cars operate principally over steam railroad right-of-way where the track is obliged to carry heavy freight trains every day and is constructed accordingly.

An Indirect Argument

OWNERS of automobiles in the territory served by the Beaver Valley Traction Company, New Brighton, Pa., have a chance to compare the cost of operating their cars with cost of street car rides if they use the expense cards that have been distributed by General Manager C. D. Smith. "We are not finding fault with the automobile," he writes, "but are just bringing about an understanding."



AUTOMOBILE EXPENSE CARD

Month of................................, Year..........

Speedometer Reading—First Day..................

Speedometer Reading—Last Day..................

Total Mileage for Month..................

Liability, Fire, Theft and Collision insurance costs should be listed monthly at one-twelfth of insurance cost.. Finance charges should be listed monthly at one-twelfth of cost. Depreciation should be listed monthly at one-thirty-sixth of price paid.

Date	Tires	Gas	Oil	Parts	Labor	Tubes	Parking	Wash	Daily Total
1									
2									
30									
31									
Total									

Depreciation and Insurance........$..............

Finance Charge and Garage Rent..$..............

Grand Total—Cost For Month.....$..............

The last figures show the cost of operation for the month. If you desire the cost per mile divide the cost of operation by the number of miles. If you desire to ascertain the cost per day divide the total cost by the number of days in the month.

A year's supply of these cards will be furnished upon request. Kindly write the
BEAVER VALLEY TRACTION CO., NEW BRIGHTON, PA.

Problems of Mass Traffic

By J. Rowland Bibbins
Consulting Engineer, Washington, D. C.

Broad consideration of the entire transportation problem in cities shows that all elements, both freight and passenger, must be taken into consideration if real relief and provision for future growth are to be obtained. In this article, abstracted from a paper presented at a conference held in Chicago on April 13 under the auspices of the National Automobile Chamber of Commerce, Mr. Bibbins points out the magnitude of the problem and the multiplicity of elements involved.

"TRAFFIC" as generally discussed is simply another name for "mass transportation," though rarely so understood. It is worth while to broaden our conception for the moment to examine base principles, trends and future needs to see whether the real problem will be met by any other policy of approach than sound technical planning, based upon transportation experience.

For the traffic problem of today seems to be the result of bad planning of yesterday and lack of appreciation today of transportation essentials.

Look at the following perspective:

Per 1,000,000 persons, the average large city covers 107 square miles, while the metropolitan district covers 364 square miles; the average length of streets is 800 to 2,000 miles; the average street railway track is 300 to 500 miles; the average motor registration is 100,000 to 400,000 vehicles. Population of a large city doubles in five to 40 years, say 30 on the average. In this time city land values increase about three times; city passenger traffic, rail and motor about four times; railroad freight tonnage about seven times; railroad passenger traffic about eight times. Motor registration in the United States doubled in the last 4½ years, with a decreasing rate of increase.

Therefore study now the problem of doubled population without stopping to quarrel just when it will take place. The above perspective of the physical problem today and the clear trends of traffic growth tomorrow are sufficient, for the purpose of this discussion, to put to the acid test the propriety of any opportunist policy, i.e., whether superficial or fundamental measures are in the best interests of the community as a whole, and whether, in our mad scramble for relief, the right emphasis is being placed upon the various elements of the problem.

My perspective of any traffic and transportation problem involves all these elements: rail, transit, bus, truck, taxicab, automobile, horse, pedestrian, and even water transport—all to be co-ordinated in a city-wide, well-integrated, unified, transport system, both passenger and freight, with "track and service" capacity adjusted to local needs, particularly to recognize the differentials in speed and bulk of these various transport agencies.

At the outset, I submit the debatable proposition that the private automobile is not by any means the greatest part of our problem; but that freight transport, which has been almost entirely neglected, looms very large in the picture, especially in the central district.

Time is the first essential—home to work. The 30-minute time zone practically controls the main settlement of our denser city areas. Five minutes saved expands the zone 1 mile; fifteen minutes, 3 miles. Thus, double the populated area can be brought within the 30-minute time zone at the same cost. Here is the basic answer to traffic congestion, and motor competition.

It needs no demonstration that the widespread use of private motors in rush-hour transportation is due largely to the demand for speed, increasing with the spread of our cities. Troublesome as it is, the private motor is fulfilling an economic need, complementary to established public agencies which may not fill that need.

An ideal transport system is essentially based upon speed (and fare) differentials: (1) railroad suburban service, steam or electric, to central terminals or through-routed; (2) rapid transit on private rights-of-way, surface outside, and elevated, depressed or subway inside; (3) automobiles and taxicabs; (4) buses, express and local; (5) by "Shanks' mare." And the last is by no means unimportant, for our surveys show that more than 25 per cent of our major industrial employees walk to work. And industries are being relocated to make this possible.

Now, in practice we are trying to run express, local and freight services on surface streets already cluttered by business. A modern transit system handles 20 per cent of the total traffic in the maximum rush hour, and at least the entire population once every day. Rapid transit system peak loads run from four to ten times midday movement. In large cities, rush-hour tripper cars can make only one load-trip during each rush period. While central district traffic will always be heaviest, cities are developing more and more through-riding and crosstown riding, entirely outside the center.

Transit routing and terminals are thus of fundamental importance, though many systems still adhere, mainly by necessity, to the "town-pump" system of focusing all service and transfer facilities at the center, which involves the serious question of franchises.

After years of study of transit and traffic and the practical aspects of city planning, zoning and motor transport, I submit the proposition that the electric car, mainly surface transit, is still the essential backbone of passenger mass transportation. Each form of motor transport, however, has its particular part to play in a properly unified system of differential speeds, fares and services. In view of the existing paving situation, mounting taxation and financial condition of our cities, it seems idle to talk now of replacing the transit system by buses, except in very specific instances and localities. The automobile must play its part, largely complementary, rather than competitive.

By the same token, it is the clear responsibility of the electric railway industry and city officials to develop transit by every known means to maximum schedule speed and capacity, as the greatest single contribution to the reduction of central traffic congestion. No adequate city plan or traffic plan will survive the acid test of experience and public need, unless it recognizes these transport elements in true perspective. We shall not by fiat clear our streets of 14,000,000 city motors, nor shall we relegate to the scrap heap 30,000 miles or more of urban railways.

FREIGHT TRANSPORT ON CITY STREETS A SERIOUS PROBLEM

The volume of motor freight is exceedingly difficult to estimate, although we know that all of our package or l.c.l. freight requires one or more terminal handlings in our cities. Little progress has yet been made in night haulage of commodities and construction materials, also little progress as yet in consolidated motor tracking to increase the loading efficiency of the city truck, and little or no progress in the scheduling of retail merchandise during off-peak hours for consolidated motor delivery to reduce waste mileage, and avoid peak congestion. Clearly, the tendency of local freight transport is more and more toward the public streets.

I have found in some downtown cordon traffic counts that truck and delivery movement in a large city is perhaps 50 per cent of the automobile movement, in many districts exceeding that of autos. Thus, bearing in mind relative speed, bulk, and character of drivers, it is perhaps not an exaggeration to say that motor freight transport has grown to be perhaps as serious a part of the traffic congestion problem as the private auto. Yet it has received very little, if any, detailed study and consideration. I submit it to be deserving of equal consideration in the traffic-transit plan, not so much by virtue of its volume, but by its obstructive nature.

> **AFTER years of study of transit and traffic and the practical aspects of city planning, zoning and motor transport, I submit the proposition that the electric car, mainly surface transit, is still the essential background of passenger mass transportation. Each form of motor transport, however, has its particular part to play in a properly unified system of differential speeds, fares and service.**

"EXPRESS AND LOCAL" SERVICE

Coming now to specific matters, the only way to insure needed speed differentials is by traffic segregation in the thoroughfare plan with different streets so far as available for transit (which usually means business streets) for fast traffic (usually automobiles and bus) and for slow heavy-duty trucking. A detailed examination of most city street systems will reveal possibilities for securing this segregation. The policy of concentrating all traffic on dense transit streets simply defeats all fast transportation, both rail and rubber.

To secure these speed differentials with existing facilities, we must have limited-stop service for expresses, meaning skip-stops. The bus, although less mechanically suited to frequent stops, will probably have to do this service and stop at the curbs, thus raising the transit schedule speed, perhaps to 15 m.p.h. outside of the central zone. It appears from experience that large-capacity buses, especially double-deckers, can not make the high schedule speed demanded in mass transportation, largely due to design restrictions and unavoidably slow loading and unloading. The small-capacity unit really fulfills a good purpose on a transit trunk. The real reason seven-passenger jitneys have survived in Detroit is because they are needed. Making only two or three stops per mile, they are today able to double the street car speed and far exceed the local buses. Large-capacity buses of course have their field, especially in developing new routes, distinctly not on transit trunks.

Adequate continuous paving lies at the bottom of practical traffic segregation, needing no signs, signals or policemen. A relief route well laid out and reconditioned will immediately be discovered and used.

As there are approximately 1,000 miles of city pavements per 1,000,000 city people, here is perhaps the major economic problem of traffic which has been generally sidestepped, i.e., to provide "tracks" for our growing motor transport system.

Any thoroughfare plan must be financed, presumably on the basis of relative usage and wear. The fact is that thousands of miles of old light pavements have suddenly been thrown into heavy duty service for which they were never designed. It thus appears that financing traffic street pavement at $50,000 or more per mile is a far larger problem than financing railway track at $65,000 per mile, exclusive of pavement. It will not do to waive the matter aside as one of general taxation, and the cost of motor "tracks" will soon have to be recognized as part of the cost of transportation by rubber, as well as rail.

Terminals.—Railroads cannot operate without terminals. But we are expecting the same from traffic, an impossibility. I refer to day storage as distinct from short-time parking as one of our "essentials." This very practical problem has been utterly neglected. A few de luxe garages charging 75 cents to $1 per day will have no appreciable effect upon congestion. A day storage service at not more than 25 cents will have to be developed if real results are to be expected. Garaging has thus become a major national utility, and the community itself may have to undertake at cost some form of self-supporting garage service.

Wider Roadbed.—Railroads usually had the foresight to provide a 100-ft. right-of-way against their future needs, and expanded by adding one, two or three tracks. But street widening is daily becoming financially more prohibitive. The efficient method of "arcading" to widen roadways to double present capacity while still preserving the old air rights has made no progress, yet wholesale arcading would probably cost not more than 25 per cent as much as full street widening.

The alternative is double-decking, even more financially strenuous. The South Water Street double-deck improvement along the Chicago River, known as Wacker Way, cost $30,000,000 a mile, the same as the London widening, Kings Highway to the Strand. Although in Chicago the benefit assessment practically absorbed the damages awarded, it is clear that few cities can undertake such an ambitious program over large areas with an additional complication of ascending ramps and the problem of ventilation of the lower level. This has received little consideration, although we introduced it in the design of Wacker Way.

Railroads run on standard gage. Similarly, the old decimal system of street width must give way to a design adjusted to the number of lanes needed and paved accordingly. And the standard width should be adjusted further according as the streets are to handle street cars, buses or trucks, or motors only, for there is 3 ft. difference in the widths of these vehicles, or over 50 per cent of the standard auto width. The relative volume of movement should control; thus a transit street operating 30 seconds rush-hour headway should be more liberally designed than one operating ten minute headway; similarly with buses and trucks.

WE MUST have both safety and speed. But this never will be realized until mass transportation, both rail and rubber, is designed and operated collectively along modern transportation lines and so conceived in the city plan.

Street widening, in the absence of local benefit assessment and excess condemnation, is thus the most serious economic problem. We shall never catch up with the budget under present methods. New York City's budget is increasing as the cube of the population, property values as the 2.7 power. Main city land values, the basis of all tax revenue, increase much slower than the square, and in the central high value districts about proportional. Thus, the vicious economic circle is started—first, raising the assessments, which in turn force up the skyscraper, which in turn raise the assessment again—the circle has become a spiral. The day population is concentrated beyond all bounds of efficient mass transportation and sidewalk capacity. Witness one building proposed in New York, holding a young city of 14,000 people, which alone would absorb one-third of the capacity of an entire subway line. This raises the very serious question, whether rapid transit really relieves or simply concentrates central congestion, although through-routing as distinct from loop terminals undoubtedly spreads commercial business. It must spread. For I have recently discovered that high-building cubage is increasing as the square of the population, i.e., four times today's in 1950.

At the very center of this circle lies the real crux—land values and taxation.

OPERATING EFFICIENCY

For the present, our one hope is efficiency. A railroad superintendent operating on two tracks of a four or six-track system would promptly be fired. Yet we are doing just that thing in traffic. And my closing proposition is that until we devise some equitable source of further public revenue for vast public improvements higher efficiency in mass transportation, rail and rubber, is our main avenue of present escape. In one large city with 90-ft. streets and 60-ft. pavement, I found within the mile square only 25 per cent traffic efficiency assuming solid parking or perhaps 12 per cent clear. This city was actually encouraging one-line traffic each way, and could easily have doubled its capacity. I think we must come to parallel lanes marked with white paving blocks, or flat white metal plates. Now, the capacity of our streets is reduced at least 50 per cent by "meandering," or straddling lanes, and big buses are notoriously offenders in this respect.

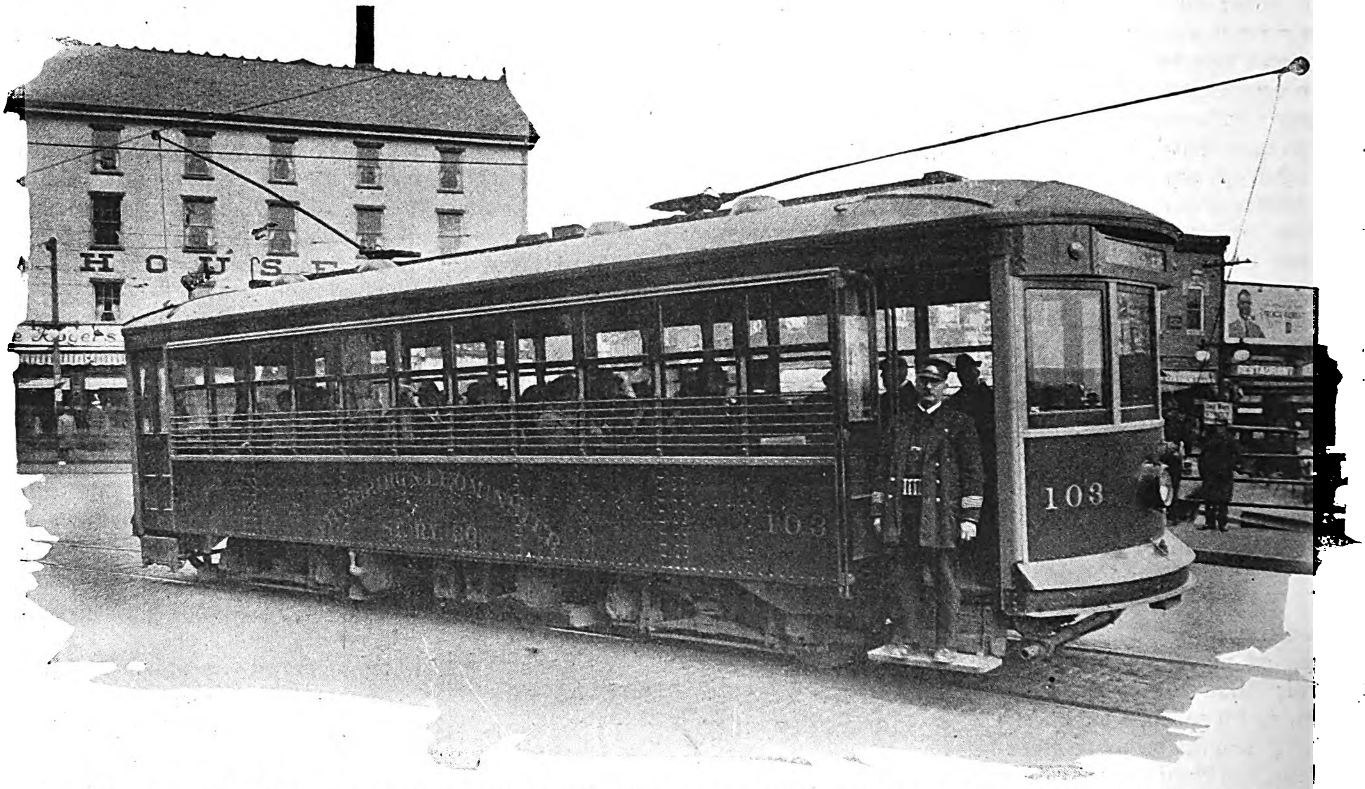
The reversible center line on heavy traffic streets has at least been tried in Cleveland with success. The New York elevated delivers express service with three tracks, reversing the center track morning and evening, making it equivalent to four tracks for express and local. By this simple means, present streets can be increased from 50 to 100 per cent rush-hour peak capacity when capacity is most needed.

In comparison, one-way streets are generally an economic blunder, and in any case, should be in pairs, rather than singly, though cutting the total street capacity to half. Reversible street operation, morning and evening, is clearly impracticable, but reversible center line is practicable.

We all grumble when the Capitol Limited or the 20th Century is held up at some block signal, yet I venture the assertion that probably 50 per cent of the total crossing time and capacity of our city traffic intersections is being wasted by badly adjusted "stop-and-run" signals or in hand control by waiting for "stragglers." Yet railroad signal practice pointed the way 30 years ago. The Chicago system of progressive interlocking movement and especially with independent control of each and every intersection, not only as to period, but as to time ratio or balance of traffic, is the one outstanding encouraging development, an adaptation of railroad and subway transportation experience.

SHORT SIGNAL INTERVALS NEEDED

The shortest possible signal interval is essential for maximum volumetric efficiency. This can only be determined by "calibrating" a traffic crossing under different load conditions, just as a voltmeter is calibrated for accurate reading. It is general observation that the usual run of signal installation has retarded transit and traffic movement throughout the country and diverted traffic from the logical artery to those less suited. Example, one of our largest cities installed a stop-and-run system, 100 seconds cycle, on its main business trunk carrying rush-hour car service at 22 seconds headway. Result, which any transportation man could foretell, from 2 to 3 minutes added trip time to every car entering the business district. This is not efficient transportation or planning. It is not enough to hide behind the slogan "order and safety." We must have both safety and speed. But this never will be realized until mass transportation, both rail and rubber, is designed and operated collectively along modern transportation lines and so conceived in the city plan.



New cars of this type placed in service Jan. 1, 1927, on the Fitchburg & Leominster Street Railway have reduced operating expenses about 15 per cent and increased the gross revenue

Rehabilitation Increases Riding on the Fitchburg Railway

By Emerson W. Baker
President Fitchburg & Leominster Street Railway, Fitchburg, Mass.

During past year track has been rebuilt, new rolling stock bought and rotary converters installed in old power house. Energy is now purchased. Operating expenses have been reduced about 15 per cent

NOT much more than a year ago the Fitchburg & Leominster Street Railway, with its 40 miles of track serving these two Massachusetts cities and also Lunenburg, Shirley and Ayer, was on the verge of bankruptcy. Buses were being given the preference by the traveling public and street railway patronage was fast disappearing. As a member of the law firm of Baker & Baker, counsel for the company, the writer had become thoroughly acquainted with its problems. To meet this emergency a plan of reorganization was carefully worked out. Today, scarcely more than twelve months since the reorganization was effected, the Fitchburg & Leominster Street Railway is coming back into its own.

Before the advent of the automobile this railway was one of the most prosperous properties in the entire state. Its bonds were gilt edged and its notes were sought by banks. Its tracks and equipment were well maintained. Its income was constant and adequate and its dividends were regular and satisfactory. For years the stock sold at many points above par. But with the coming of the auto this situation gradually changed. The income shrank from year to year until it seemed almost as though there would be no stopping point.

The company had a funded debt of $400,000 and more than $700,000 of unsecured notes, as well as $450,000 of stock. Before the bonds came due on Feb. 1, 1921, they were extended until Feb. 1, 1926, with interest at 7 per cent. The notes carried interest at 6 per cent. This made the annual fixed interest charges about $70,000.

In the spring of 1925 it was apparent that something

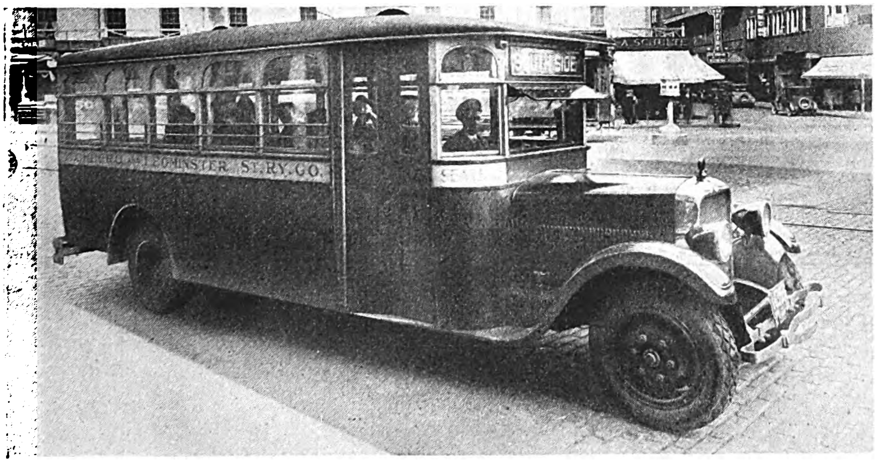
ANALYSIS OF OPERATING EXPENSES

	1927 January	1927 February	1927 Total
Maintenance of way and structures...	$2,704.48	$2,879.07	$5,583.55
Maintenance of equipment..........	2,970.07	2,446.82	5,416.89
Power..........................	6,532.98	5,968.00	12,500.98
Transportation expense.............	11,164.21	9,054.96	20,219.17
Traffic..........................	165.59	114.42	280.01
General expense..................	2,016.42	2,355.48	4,371.90
	$25,553.75	$22,818.75	$48,372.50

	1926 January	1926 February	1926 Total
Maintenance of way and structures...	$2,082.17	$5,941.90	$8,024.07
Maintenance of equipment..........	2,507.31	2,843.43	5,350.74
Power..........................	7,744.84	7,267.60	15,012.44
Transportation expense.............	11,080.92	10,263.16	21,344.08
Traffic..........................	69.57	67.49	137.06
General expense..................	3,513.52	2,949.09	6,462.61
	$26,998.33	$29,332.67	$56,331.00

drastic must be done if the railway was to be saved. So the writer, purely as a volunteer but with the knowledge and friendly co-operation of a noteholders' protective committee, went about the state and talked with as many of the bondholders as possible. He pointed out to them that unless they gave some assistance on Feb. 1, 1926, they would find the street railway company on their hands and would be faced with a serious impairment in the value of their bonds. Somewhat later a meeting was held at Fitchburg attended by a large majority of the bondholders. There were present also representatives of the noteholders and stockholders. They appointed committees to represent each group and delegated to G. A. Gaskill of Worcester and the writer the duty of formulating a definite and constructive plan of reorganization.

As finally worked out this plan contemplated a five-year test period to determine what could be done. The bondholders were asked to accept 5 per cent and 4 per cent instead of 7 per cent. The noteholders were asked to accept 1, 2, 3, 4 and 5 per cent interest for the first, second, third, fourth and fifth years. The stockholders were asked to place their stock for five years with trustees who should be designated by the protective committee and should vote the stock and elect officers during this period.



Five Studebaker buses of this type have been in service for several months and are proving more satisfactory than the heavier vehicles formerly operated

On Sept. 23, 1926, the plan became operative. The directors met and elected E. W. Baker as president, B. N. Hodges as treasurer, and L. H. Cushing as manager.

Track was in very bad condition and in some places almost unsafe for operation. A large repair gang was immediately put to work on the roadbed at a weekly cost of about $1,000. A number of lines were rebuilt, the work continuing until halted by cold weather. While this large increase of the payroll was a severe drain on the resources of the company, it was considered so essential to get the track in good condition that there was no alternative. This spring it is proposed to do further work on the track, replace light rails with heavier rails, put in new ties wherever needed and ultimately to have smooth, properly aligned track everywhere on the system.

The cars were almost all ancient, broken down and hardly usable, costing an excessive amount for repairs needed to keep them running. It seemed imperative that the public be given something better in which to ride. Immediately after the reorganization, the company ordered four new 26,000-lb. cars costing $13,000 each. These were built by the Wason Manufacturing Company. It was far from clear how the cars could be paid for even though the terms were only one-quarter down and the balance distributed over a period of five years. By exercising rigid economy, however, the company was able to accumulate sufficient funds to make the first payment, and by Jan. 16, 1927, all four cars were in active service. Four more of the same type ordered in February, 1927, have just been delivered.

Snow-fighting equipment was not dependable and was worn out. This was a serious difficulty because nowadays the best riding occurs on New England street railways during the winter months. A second-hand but satisfactory and effective sweeper was purchased for $1,500. This has proved adequate to take care of the snow problems during the worst storms of the past winter.

The carhouse and power house were dilapidated and their roofs leaked badly. They have been temporarily repaired. Later it will be necessary to put on new roofing, but the expense will not be heavy. One end of the carhouse where buses were sheltered was open to the weather and the heating was inadequate. This has been boarded up and doors installed so that it is now protected and properly heated.

Power house equipment was practically worn out. The steam boilers, originally high-pressure units, had been forced to reduce pressure from time to time by the state inspectors and were in danger of being con-

SUMMARY OF REVENUE AND EXPENSES

	1927 January	1927 February	1927 Total
Operating revenues................	$33,883.75	$30,678.60	$64.562.35
Operating expenses................	25,553.75	22,818.75	48,372.50
Income above expenses...........	$8,330.00	$7,859.85	$16,189.85
Interest........................	2,768.00	2,768.00	5,536.00
Taxes...........................	960.23	960.23	1,920.46
Net income......................	$4,601.77	$4,131.62	$8,733.39

	1926 January	1926 February	1926 Total
Operating revenues................	$33,945.13	$29,896.02	$63,841.15
Operating expenses................	26,998.33	29,332.67	56,331.00
Income above expenses...........	$6,947.80	$563.35	$7,511.15
Interest........................	5,887.23	5,887.33	1,774.56
Taxes...........................	1,047.60	1,107.59	2,155.19
Net income......................	$12.97	*$6,431.57	*$6,418.60

* Deficit.

demned at any moment. The books showed that energy was costing about 2 cents per kilowatt-hour, but the expense probably was even greater than that. A contract was made with the Fitchburg Gas & Electric Light Company to buy energy at a much lower figure. Three modern rotary converters were installed in the old power house. These operate effectively and satisfactorily in place of the machinery which has been removed. Another rotary converter is used as a booster in the Cleghorn district of Fitchburg. All the old machinery has been sold for junk. The converters cost about $10,000 completely installed, but the company has four years in which to pay for them. They are expected to be adequate for its needs for a long time to come. It has been estimated by the engineers that the net saving in energy cost will amount to some $10,000 to $25,000 a year.

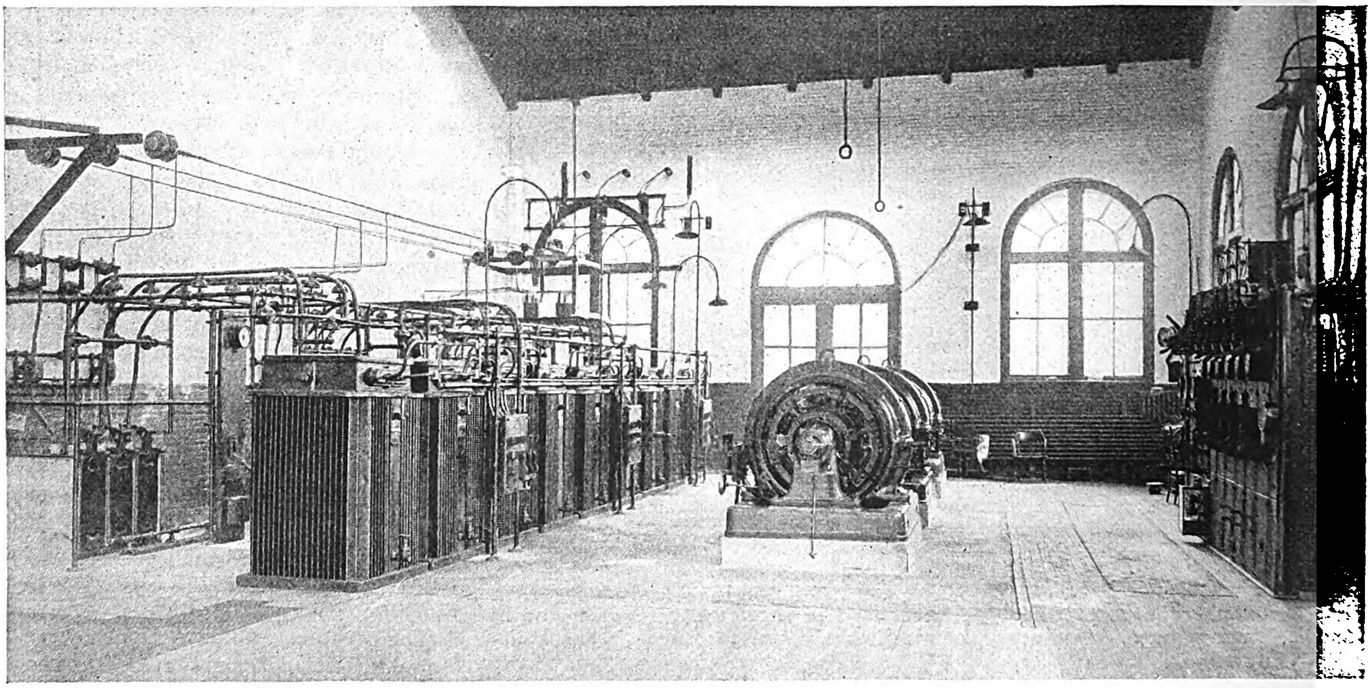
Overhead wire in places was found to be thin and weak. In the spring it is planned to secure some used copper trolley wire for replacement purposes and install it where it is most needed. At a relatively small expense this problem will be solved for the time being.

Whalom Park is owned by this company and is one of the best located natural parks in the state. Its woods were seriously damaged by cyclones a few years ago. Its popularity has been even more adversely affected, however, by the failure to keep up the general tone of the park. It is proposed as soon as the weather permits to repair and repaint the buildings, especially Whalom Inn, and to make them clean and attractive. Only the best amusement features will be tolerated and a conscientious effort will be made to regain for the park the splendid reputation which it formerly enjoyed.

Use of buses presented a complicated problem. In the fall of 1925, because of competition by independent operators and the unwillingness of the city government to protect the railway, the old management felt obliged to go into the bus business. Five 28-passenger buses were leased. These were permitted to parallel the car lines. Roughly speaking, with reference to the period from September, 1925, to the time when the present management took charge, these buses increased the expenses of the railway about $75,000 and added less than $2,000 to the income. It was obvious, therefore, that there would have to be some radical change of policy with respect to bus operation. It was felt that the buses were too heavy and too expensive to operate and that duplication of service was unwarranted and unwise. The lease, therefore, was discontinued and instead the company is operating four light-weight 21-passenger Studebaker buses. Routes have been revised so that the buses are acting as feeders to the principal rail lines.

Large rent was being paid for the offices uptown. This seemed an unnecessary expense and the office has now been moved to the power house, where ample room is available. The dispatcher's office is also located under the same roof.

A study of the records showed that about $5,000 was being paid annually for insurance premiums based on valuations which had long since ceased to be correct. Policies have now been adjusted to suit the present situation and an annual saving in premiums has been effected, amounting to about $3,800.



Rotary converters installed in Fitchburg & Leominster power house, replacing old steam-generating equipment

Taxes had been paid annually to the several cities and towns amounting to about $13,000. These were based on valuations which may have been proper when the company was making money but which were considered in excess of the worth of the property at the time of reorganization. Agreements have been negotiated so that the gross annual taxes henceforth will not exceed $6,000. This cannot be made to apply to the past, or to the taxes now in arrears, but it is expected that in the future there will be a saving of about $7,000 annually.

When the present management took charge it was discovered that the line from North Leominster to Ayer was operating at a large loss. This line was promptly abandoned. For a time buses were substituted, but finally the Boston & Maine Railroad took over the operation of this route, thereby permitting the street railway to concentrate its efforts in its local territory.

Other unprofitable outlying lines have been discontinued also. The mileage of track in operation Jan. 1, 1927, was 25.35 as compared with 41.63 a year before. Daily car-miles have been reduced from 1,845 to 1,685.

Notwithstanding the reduced trackage over which service is now rendered, the gross income for December, 1926, was greater than for any month in recent years. This increase is believed to be due in large part to the four new and attractive cars. The first two months of 1927 show a comfortable increase over the corresponding months of 1926. Moreover, operating expenses have been reduced about 15 per cent as indicated in the table on page 739.

NET INCOME SUBSTANTIALLY INCREASED

Thus the net income for January and February was about $15,000 higher in 1927 than in 1926. Within the next few months it is planned to rehabilitate the remainder of the company's rolling stock so that ultimately there will be available sixteen well painted, clean and attractive cars. The management believes that the street railway has a definite and vital place in the life of the community and that nothing thus far has been devised to take its place. The original enthusiasm for rubber-tired vehicles is abating somewhat and the public is beginning to realize that buses are inadequate to handle the transportation in Fitchburg, where the bulk of the traffic is carried during the rush hours.

The policy of the management has been one of entire frankness with the public. It is felt that the railway belongs to the people. Neither the president nor any of the directors receives a dollar for his services. The old idea that the street railway was a kind of financial octopus which fastened itself upon the public, an enemy always ready to attack and to be attacked, no longer prevails in Fitchburg. The public recognizes the attitude of the new management. Indications are that patronage will continue to increase and that a sound and prosperous transportation system will be established.

Energy Consumption Accurately Measured

Survey Made to Determine Constant for Every Type of Passenger or Freight Car Operated by Nine Electric Railways in the Dayton Central Power District

ENERGY used in the operation of all cars in the central district of Dayton, Ohio, is supplied by the Dayton Power & Light Company from its Fourth Street power plant. Nine separate electric railways operate cars through this district, and in order to allocate properly the energy charges it is necessary to determine the consumption for each type of equipment.

In May, 1921, a comprehensive survey of this nature was conducted by the Economy Electric Devices Company, establishing constants for each type of equipment operated. Since these constants were based upon the energy consumption at the car, the bill rendered by the power company was in excess of the figured energy consumption, due to line loss, etc. During the first year following the survey this excess was a comparatively small amount, but shortly thereafter it began to increase until the latter part of 1926, when the excess amounted to approximately 30 per cent of the total. Accordingly, another survey was undertaken to establish new constants.

Because of the thorough manner in which the 1921 survey was conducted it was unnecessary during the recent investigation to go into as much detail as the first time. Quite a number of the cars operating in Dayton are equipped with Economy meters, hence the procedure was much simplified. On cars so equipped the meters were used in checking the old constants, the cars being in regular service. Otherwise a portable meter was used and the car operated as a special through the district. A relation was established between service and special cars by comparing similar types of equipment, and it was possible thereby to check the present energy consumption against the old constants.

Constants for freight equipment were obtained in a like manner. Most of the freight motor cars operating in Dayton are equipped with Economy meters. By riding these trains the investigators were able to obtain the energy consumption of the various freight motor cars hauling different numbers of trailers. By analyzing the data thus obtained constants were derived for light freight motors and for freight trailers. While the energy consumption of a freight train does not vary directly with the number of trailers hauled, the differential is small, and in order to simplify the bookkeeping a single constant was established for all freight trailers.

Practically all of the rolling stock used in city service is now equipped with electric heaters. The exact amount of energy used for electric heat by each company was difficult to determine due to differing standards of heating on the various properties. The amount of heating energy used in proportion to the motor energy in the central district is high, because of the length of time required to move the cars through this area.

Temperature of the outside air is a factor which largely affects the energy consumption of heaters, and it is obvious that as much heat will not be required during a moderate day as on an extremely cold day. This presents an accounting difficulty. The old system required that all trips be reported as "heat trips" during the heating season. It was thought by the investigators that a well-defined relation exists between the average monthly temperature and the amount of energy used for heat and that a more accurate method of calculation should be used. In the following tabulation is shown the per cent of trips recommended to be reported as heat trips during each of the seven months of the year when heaters are used.

Month	Mean Monthly Temperature	Per Cent of Trips to Be Reported as "Heat Trips"
August	73.4	0
September	72.6	0
October	47.0	30
November	40.9	60
December	29.6	100
January	28.8	100
February	33.7	75
March	33.9	50
April	45.6	25
May	62.8	0

Figures were developed by this survey showing the energy consumption for motors and heaters on each type of car operated by each of the nine railways. By the use of these revised constants and the recommended proportion of heat trips it is believed that the total energy consumption can be accurately divided and the proper amount allocated to each railway.

The Readers' Forum

Standard Specifications Should Be Utilized

80 PARK PLACE
NEWARK, N. J., April 18, 1927.

To the Editor:

I recently read with considerable interest an article in the Feb. 12 issue of the *Electrical World* covering the high points of an address by C. F. Hirshfeld, chief of the Detroit Edison Company's research department, before the third annual meeting of the public utility group of the National Association of Purchasing Agents at Detroit in January, 1927. This article contains several thoughts that should be of sufficient value to call to the attention of the purchasing agents and engineers of the electric railway industry.

The first is the need for co-operation between them and the necessity for each thoroughly understanding the viewpoint of the other. The next thought that seems to me to be of particular value, especially to the engineer, is the desirability of utilizing existing standard specifications, such as those of the American Society for Testing Materials and the National American Standards as adopted by the American Engineering Standards Committee. It is quite probable that, except in certain very special cases, all practical requirements will be met by one of these standard specifications, which, as Mr. Hirshfeld states, have passed through the trial of fire and the test of actual use over a period of years. They are generally accepted as representing the best commercial manufacturing practice, and if individual engineers are going to continue to insist on using their own particular specifications much of the benefit of standardization will be lost. Mr. Hirshfeld has well stated the case when he expresses the belief that "Mr. Engineer cannot take offense when Mr. Purchasing Agent asks him to explain why the standard material or equipment which many manufacturers are prepared to furnish is not good enough, and he is no proper engineer if he cannot produce a proper answer. There are exceptional cases where something better than the nationally accepted standard is required, but fortunately they are few and far between."

Perhaps a large part of the difficulty can be attributed to a lack of proper knowledge on the part of the engineer as to just what materials are covered by national standard specifications or by those of our national associations, and of their specific requirements. It is quite probable in many cases that he has never taken the trouble to study them and compare them with his own and attempt to convince himself that they would meet his requirements equally as well as his own specifications. The solution of the problem would seem to be a thorough knowledge on the part of the purchasing agent of the various existing standard specifications, at least by title, so that he could then be in a position to call them to the attention of the engineer when the latter submits his own particular pet. There must also be a willingness on the part of both officials to confer on such matters so that each may have a chance to obtain the viewpoint of the other.

The last important matter discussed by Mr. Hirshfeld has to do with a practice in vogue in some purchasing departments of pitting one vendor against another after bids have been received, for the purpose of securing percentage reductions from the first quotations. He calls it "the questionable satisfaction of 'persuading' them into a reduction," and states as his experience that "the cleverer salesmen serve up to you exactly the sort of dish that your past performances lead them to think that you want." It is quite probable that a great many purchasing agents, if they made an honest analysis of the situation in their own cases, would have to admit the truth of this conclusion. It is only once that a vendor will submit a bona-fide quotation and find that in order to secure the order he has to cut an amount equal or approximately equal to his estimated profit. Once it becomes known that this is the practice employed in making purchases, and such news spreads around rapidly, original quotations are submitted on the basis that such cuts will be asked for and the saving to the company becomes imaginary rather than real. It may even mean an increase in cost. The practice certainly creates bad feeling among the vendors and it should be condemned as strongly as possible. It has a decided disadvantage when employed in the case of prices being obtained for use of a contractor in an estimate when competing with other contractors for a job. The result is that the vendor submits lower quotations to the purchasing department which awards contracts upon the basis of original quotations than to the firm which insists upon the bargaining process after receipt of quotations, and the effect on the bid of the latter is too evident to require discussion.

HOWARD H. GEORGE,
Chairman Committee on Way and Structures,
American Electric Railway Engineering Association.

Agrees on Need of Research Department

PITTSBURGH RAILWAYS
PITTSBURGH, PA., April 19, 1927.

To the Editor:

The letter by H. S. Williams, assistant superintendent of equipment Department of Street Railways, City of Detroit, published in the March 26, 1927, issue of ELECTRIC RAILWAY JOURNAL, page 575, was read with a great deal of interest.

It is believed that such a research department is very necessary to the proper functioning of the American Electric Railway Association. Such work as is being done in Joliet, Ill., and Springfield, Mass., on more modern design of street railway equipment is a sign of the need of such a department in the association.

The entire expense of work of this sort should not be borne by individual properties, but should be divided among the companies composing the industry. The only way this may be done is through the establishment of a research department in the association.

W. T. ROSSELL,
General Manager.

St. Joseph Belt Line Half Finished

THE belt line, a 22,000-volt power transmission line which is being constructed by the St. Joseph Railway, Light, Heat & Power Company, and when completed will entirely encircle St. Joseph, is half finished. More than $75,000 has been expended on it and almost that much more will be used in finishing the job, which will take two or three years more. The big substation on Cook Road, north of the city, was completed and put in operation in December, 1926, and its completion marked the last work on the belt line last year.

MAINTENANCE MEN, Here Is Your Opportunity—

Go After a Prize!

First Prize . .	**$200**
Second Prize . .	**$100**
Third Prize . .	**$50**

Twelve Monthly Prizes, $25 Each

IN ELECTRIC RAILWAY JOURNAL'S Maintenance Data Contest you may win the money; you are sure to acquire greater prestige. Help to increase interest in the work of the maintenance man!

For the benefit of new readers and those who may have missed the announcement in last week's issue of ELECTRIC RAILWAY JOURNAL, the conditions for competing for the various prizes offered in the Maintenance Competition are restated in condensed form. Full information will be found in the April 16, 1927, issue, pages 700-701.

Three capital prizes will be awarded for the three best maintenance ideas submitted before Aug. 1, 1927. These are: First prize, $200; second, $100, and third, $50. In addition twelve monthly prizes of $25 each will be awarded, one each month beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Sheet Section of ELECTRIC RAILWAY JOURNAL, and a minimum of $5 will be paid for each article published.

ANY employee or official of an operating electric railway or electric railway bus subsidiary may compete for the prizes.

Each contestant may submit any number of items he desires. Each will be judged separately.

The prizes will be awarded primarily on the value of the idea presented and its adaptability to maintenance work on electric railways. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may describe any maintenance practice or device used by any department of an electric railway, such as the maintenance of rolling stock, buses, shop equipment, or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc.

Articles should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words, with not more than two illustrations.

MANUSCRIPTS should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue and 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated before Aug. 1, 1927. Photographs or sketches that accompany the manuscript may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made. Photographs, sketches and manuscripts should be marked so that should they become separated they can be identified readily.

Monthly prizes will be judged by the committee, to be announced later, after the articles are published in the Maintenance Data Sheet Section, the best item being selected each month from those appearing in the issue in the month devoted to Maintenance and Construction.

The announcement of the winner each month will be made in the issue devoted to Maintenance and Construction, the third issue each month, following the one containing the items.

The winners of the capital prizes will be announced in the Annual Convention Number of the ELECTRIC RAILWAY JOURNAL to be published in September, 1927.

ELECTRIC RAILWAY JOURNAL offers these prizes to help maintenance men win the recognition in the industry which they deserve. Enter the contest now. Send in as many of your maintenance practices as you like. The JOURNAL will pay $5 for each item published, whether or not it wins a prize. The more items you send in the more chances you have of winning a capital or a monthly prize. Get started early. Articles to be published in the Maintenance and Construction issue for May will have the first chance to win one of the $25 monthly prizes. Maintenance men, here is your opportunity!

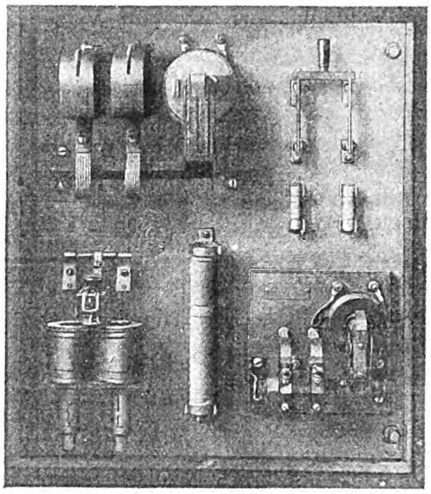
Maintenance Notes

Convenient Truck for Armatures

WITH a capacity of eight large-sized armatures, a truck has been constructed in the shop of the Grand Rapids Railway, Grand Rapids, Mich., for running into the oven and supporting the armatures while they are being baked. The truck, which runs on a stationary track between the dipping tank and the oven, can be readily pushed by the workman. The top of the truck is covered with galvanized iron and has holes arranged so that the armatures can be set on their end bells with the commutator ends up just as they are received from the dipping tank. By particular care in spacing the holes the truck is arranged to accommodate different types of armatures.

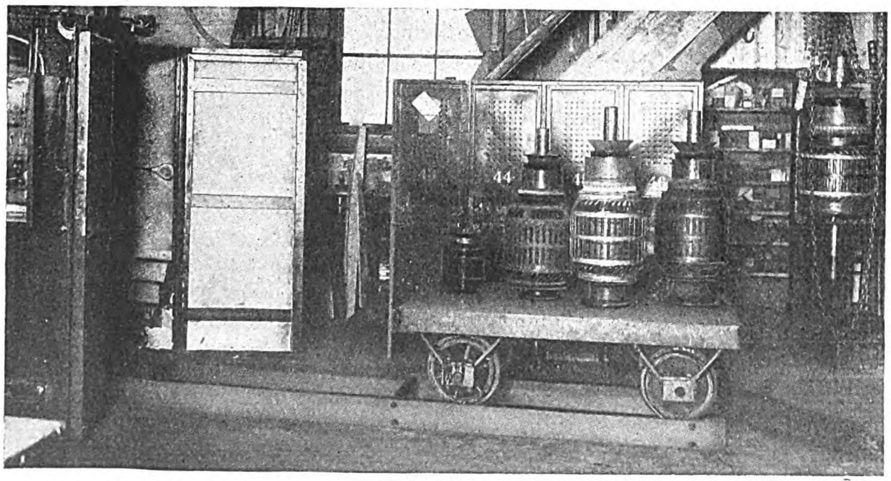
The baking oven used was constructed in the shop. It is of sheet steel with a height of 6 ft., length 6 ft. and width 5 ft. Each side is made as a complete unit so that it is portable and can be set up quickly. The sections are made with a ⅜-in. x 3-in. x 4-in. angle framework covered with No. 20 gage sheet steel and No. 16 gage galvanized sheet inside. An inside lining of 2-in. Johns-Manville panel cell asbestos insulation is used between the sheets.

The oven is heated electrically with six 110-volt, 3½-kw. heaters in series across the 600-volt trolley circuit. Thermostatic heat control is used, the control panel being located on the side of the oven. This is fitted with a glass door so that all equipment can be seen readily. Thermostats inside the oven are set so as to indicate the temperature at the commutator neck, as it appears that the solder in the leads is the limiting temperature. Heaters have baffles so as to direct the heat through the trucks and thus prevent its escape at the sides.


The oven control apparatus is covered with a glass door

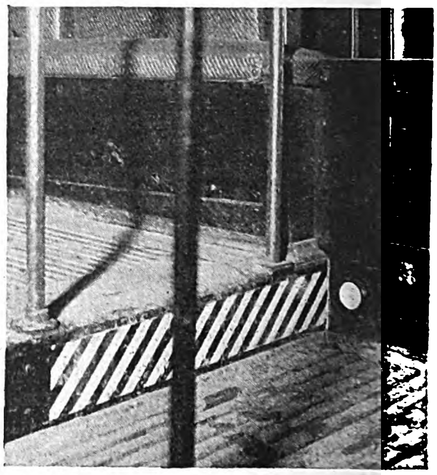
For ventilation the oven has four 2-in. x 4-in. adjustable louvers and a 5-in. stovepipe from the center of the oven leading outside the building. A damper inside controls the amount of ventilation.

The dipping tank is located under the floor and is 18 in. diameter by 46 in. deep. It is piped to a large barrel outside the building so that it can be refilled easily as the varnish is used. The float has a sheet iron tube, closed at one end. The armature shaft fits into the tube as far as the wiper ring so that varnish cannot get on the shaft when dipping. A similar float used in Montreal for keeping shafts free from varnish was described in ELECTRIC RAILWAY JOURNAL for April 17, 1926, page 676.


Convenient type of armature truck used for handling armatures between dipping tanks and into oven

Barber Pole Stripes for Safety

ANTICIPATING accidents occurring to passengers entering the drop platform cars of the Memphis Street Railway, Memphis, Tenn., 1¼-in. diagonal black and white stripes have been painted on the end sills. Twenty-five cars were converted recently for one-man operation, and in order to provide for the easy entrance and exit of the passengers it was found necessary to rebuild the cars with drop platforms. The stripes are visible immediately on boarding the car. A lamp installed in a cabinet at the right makes the stripes visible at night.


Barber pole stripes on the end sills prevent accidents. A lamp makes the stripes visible at night

"Four out of every five have it." Prevent "pyorrhea of your gear teeth" by better maintenance of the gear center distance.

Around the World Without a "Pull-in"!

GOING farther than the distance around the world without a pull-in is the record set by the average street car of the Georgia Power Company during 1926, and it is a record of which many larger companies might be envious.

In 1921, when systematic improvement was begun on the street railway system in Atlanta, the average number of miles per pull-in was 3,002. Now, at the end of five years, the number of miles driven without a pull-in has increased to 26,041. Putting it one way, this is an increase of approximately 800 per cent. Putting it another way, it means that each street car in the city runs a distance equal to that around the world before it has to be pulled in for repairs.

At the present time Atlanta is leading the "Southern League" of street railway companies in mileage per pull-in, the average for Little Rock being 15,848 miles, for Birmingham 13,694, for Memphis 9,889, for Mobile 8,633, for Dallas 6,954 and for Covington, Ky., 5,686. Other cities show even less mileage per pull-in.

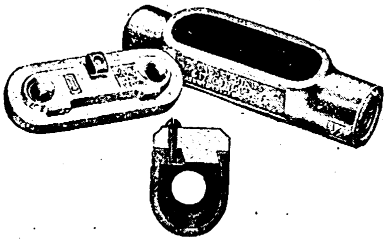
Incidentally, Atlanta is leading a good many other cities in the matter of pull-ins. The figures speak for themselves.

New Equipment Available

Wedge-Nut Fastening for Condulet Cover

FASTENINGS without screws which might project inside so as to injure wiring are a feature incorporated by the Crouse-Hinds Company, Syracuse, N. Y., in a new line of Obround condulets. The particular innovation of this line is the method by which the cover is fastened. The inside surface of the condulet at the opening has a slight bevel and the condulet cover is also provided with a corresponding bevel. After the cover is in position it is fastened by what is termed a wedge nut. This nut has beveled surfaces, one side of which fits against the bevel of the condulet while the other side is against the similar surface of the cover. By tightening a single screw on the outside the nut is drawn against the beveled surfaces and the wedging action holds the cover firmly in position.

Some of the advantages claimed are that the wedge nut holds the cover securely in position and it cannot become loosened by vibration. The cover openings are also unobstructed by any lugs necessary for fastening and therefore it is easy to pull conductors into conduits and there are no screws to project inwardly and so injure the conductors. The unobstructed cover opening provides a large wiring chamber which makes splicing and taping easy. The covers and wiring devices can be installed in inaccessible places, as they can be turned to bring the fastening screws outward and a few turns of the screwdriver clamp the covers securely. The cover and wiring devices are complete units so there is no danger of losing small parts. These condulets are furnished in the various sizes and designs which are standard by the Crouse-Hinds Company for other condulets.


New type of Obround condulet with wedge nut fastening

Flexible Mounting for Electric Hoist

MOUNTING in a fixed position, either overhead or on the ground, is possible with a new "Lo-Hed" electric hoist announced by the American Engineering Company, Philadelphia, Pa. It also can be placed on skids and used as a portable hoist. The hoist is suitable for such purposes as a car puller, hoist, derrick or elevator.

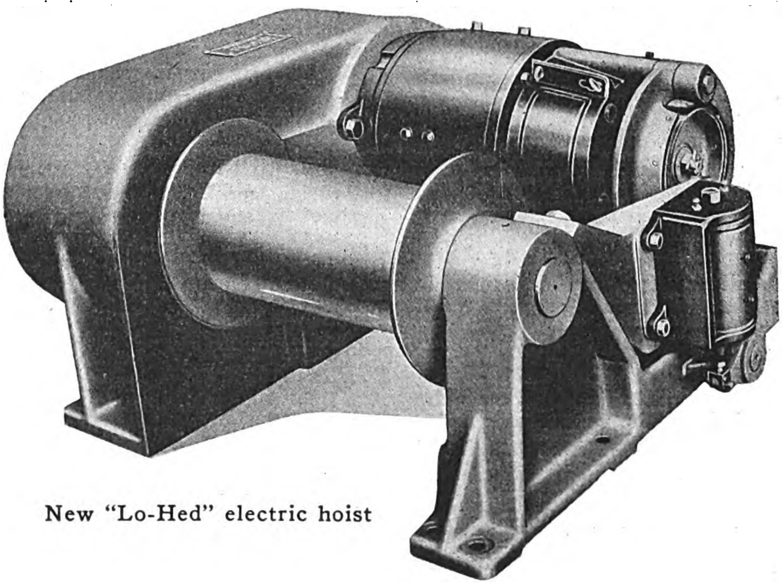
The standard machine has a smooth drum, driven by a motor through a chain of spur gears, all mounted on a common bedplate. It is furnished in sizes for handling loads from 500 lb. to 4,500 lb.

The motor and gears are inclosed completely. Gears are of drop-forged, heat-treated steel, run in an oil bath. Hyatt "high duty" roller bearings are mounted on the ends of all gear shafts. The cover of the gear case is removable.

The drum has large flanges, which prevent the rope from jumping the ends and give maximum stowage capacity. One bearing of the drum shaft is splash lubricated from the gears and the other has an Alemite fitting.

The motor has ball bearings and is especially designed for hoist service. Either d.c. or a.c. motors can be furnished. The controller is of the single-speed, reversing-drum type.

When desired, certain modifications in the hoist can be made by the manufacturer, such as the inclusion of grooved drums, push button and remote control, holding and lowering brakes, extension shafts with additional heads and either air or steam motors.


New "Lo-Hed" electric hoist

American Association News

Way and Structures

PROGRESS made in the formulation of recommendations to be presented to the standing committee on way and structures was outlined by the chairmen of the various special committees at a meeting held at association headquarters, New York, on April 7 and 8. The special committee on review of existing standards presented a progress report. Chairman George reported that he had written to the chairman of the A.R.E.A. rail committee requesting information as to the action taken by the A.R.E.A. on the request of the A.E.R.E.A. to make certain revision in its open-hearth girder rail specifications, but that the information had not been received. The chairman will follow this matter up with another inquiry if the information which is requested is not received within a reasonable time.

Mr. Alden requested that the Manual be modified to fix the tolerances for rail template fit as follows:

"No variation will be allowed in dimensions affecting the fit of the joint bars except that the fishing template approved by the purchaser may stand out not to exceed $\frac{1}{8}$ in. laterally."

After the matter had been thoroughly discussed by the entire committee and the proposed revision explained by sketches on the blackboard, it was moved to amend the motion by changing the permissible variation to $\frac{3}{32}$ in. instead of $\frac{1}{8}$ in. The motion as amended was carried without dissenting vote. The committee decided that this matter should be referred to the executive committee as soon as a letter ballot had been taken.

Mr. Merker submitted six designs of existing special expansion joint designs in actual use at various locations in Brooklyn, and called attention to the fact that the special requirements of each particular situation generally made necessary a special design each time an expansion joint was required. It was decided that the matter of expansion joint design be referred to special way and structures committee No. 2 for investigation and report as a part of next year's program.

Mr. Ryder reported that the committee on special trackwork had held a meeting at which the following subdivisions of the work were considered: (1) Switch tongue design; (2) hard center plate design; (3) design of iron binding for iron-bound special trackwork.

Mr. Ryder stated that it was the committee's intention to concentrate its efforts on subjects Nos. 1 and 2, as No. 3 could not be worked out until after No. 2 had been disposed of. His committee submitted a full-sized detail of switch heel design showing the hold-down device. Mr. Entwisle expressed the opinion that certain modifications of the proposed design would have to be made in order for it to be effective.

Mr. Merker submitted a progress report of the special committee on rails, but owing to the fact that the way and structures committee had not had an opportunity to study this Mr. Merker was requested to send a copy to each member of the standing committee, and the latter are then to submit individual written discussion to the chairman of the special committee.

COMING MEETINGS
OF
Electric Railway and Allied Associations

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

April 27-29 — American Welding Society, eighth annual meeting, Engineering Societies Building, New York City.

May 3-5—United States Chamber of Commerce, annual meeting, Washington, D. C.

May 6—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

May 9—National Conference on City Planning, Washington, D. C.

May 11-12—Central Electric Railway Master Mechanics' Association, meeting, Webster Hall Hotel, Pittsburgh, Pa., 9 a.m.

May 18-19—Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 19-23—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 29-July 1 — Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

June 30-July 1 — Tramways and Light Railways Association, annual meeting, Bath, England.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open Oct. 1 at noon.

Mr. Baker reported for the special committee on track drainage that he had prepared a tentative questionnaire on the subject which was to be sent out at an early date to the maintenance of way members of all A.E.R.E.A. committees this year. He stated that his committee had reviewed preceding reports on the subject that had been referred to them, but that the information was now obsolete and would have to be revised and brought up to date, which the above questionnaire was designed to do.

The committee on bus garage design has decided that the study of "Effect of Garage Design on Insurance Rates" was the most important assignment and that it should be given first consideration. The members have decided to study also the three following subjects, leaving the others referred to them for future attention: (1) Door design; (2) bus washing facilities; (3) ideal layouts for various street frontage conditions.

Mr. Wysor reported that there had been no meetings held but that the rail corrugation committee is slowly collecting data. He reported that the Westinghouse company is making tests covering the determination of hardness tests on corrugated rail to determine the variation in hardness between the crest and trough of the corrugations. He also reported that the services of Professor Ewing had again been retained this year. It was stated that the committee will again submit only a progress report at the October convention.

TERMINAL WORK HELD UP

No report of the committee on joint bus and railway terminals was submitted but Chairman George reported that the special committee chairman had resigned and that an invitation had been extended to another member of the committee to serve as chairman and that it was hoped to get the work of this committee under way at an early date, although it was hardly probable that any definite progress could be made this year.

Mr. Spencer gave a record of the installations of chrome-nickel steel special trackwork, which will be covered by the report of his committee. He stated that he had arranged for a series of weldability test specimens to be made by the Canadian Steel Foundries, Ltd., and that Bethlehem Steel Company, Lorain Steel Company, and William Wharton, Jr. & Company, Inc., had also signified their willingness to make similar tests. It has not been definitely decided whether to have the various manufacturers make these weldability tests on specimens in their shops or to have the specimens sent out to several railway companies for welding tests.

The entire subject was carefully discussed and it was the general opinion that the welding should be done by three railway members on identical test specimens, with the same welding wire and under as nearly the same conditions as practical, the operator being the only uncontrolled variable. It was suggested that it would probably be desirable to introduce artificial cupping in the test specimens in order to reproduce more accurately the actual field conditions, and that the welding should also be made on a ground surface. The discussion was informal and no definite action was taken by this committee.

SEVEN-INCH RAILS USED EXTENSIVELY

Mr. Alden submitted a tabulation showing the rollings of the various 7-in. girder rails by the Lorain Steel Company for a period of five years and stated that he would prepare comparable data from the Bethlehem Steel Company. This showed that over 50 per cent was the A.E.R.E.A. standard, with an additional 15½ per cent covering the A.R.E.A. standard heavy 7-in. section for use in paved streets. A little less than 9 per cent was the 116-lb. rail sections L.S.-434 and 494. Of the remainder, the greatest percentage was sections L.S.-103-478 and B.S.-103-287-A, which comprised 11.16 per cent of the total. Mr. Alden stated that it was his belief that the Bethlehem figures would show at least as high a percentage from their total rollings and that his committee would probably recommend this 103-lb. section for adoption as a standard light section girder rail, without modification.

Mr. Gailor submitted a tentative draft of a set of specifications which had been prepared as the result of the study and investigation made by the special committee on arc welding and which was now in its hands for study and criticism. He said that the rules of procedure for welding operations are now being studied by the committee. Mr. Ryder gave a comparison between the chemical requirements of the various grades of welding rods in this tentative specification and those for similar grades in the specifications of the American Welding Society. It developed that there were no radical differences.

NEW CODE OF INSTRUCTIONS

Mr. Burke read a letter sent out by Mr. Harvey to the members of the committee on pavement giving the tabulation of the replies that he had received to a questionnaire he had sent out, and also his summary of these replies.

The chairman called the attention of all members of the way and structures committee and all chairmen of special committees to the new code of instructions or rules governing committees, activities and the preparation of reports.

The date and place of the next meeting were discussed. It was agreed to hold it at association headquarters in New York on June 9 and 10, 1927.

Members and chairman of special committees present were H. H. George, chairman; C. A. Alden, E. B. Entwisle, W. G. Hulbert, H. F. Merker, E. J. McIlraith, E. M. T. Ryder, A. T. Spencer, W. W. Wysor, S. Clay Baker, E. P. Roundey, W. R. Dunham, Jr., and C. F. Gailor.

Power Generation and Conversion

PROGRESS reports were presented at a two-day meeting of the committee on power generation and conversion of the Engineering Association held at association headquarters, New York City, April 4 and 5. Those present were W. E. Bryan, chairman; L. D. Bale, sponsor; C. A. Butcher, H. W. Codding, H. A. Kidder, Otto Naef, F. W. Peters, R. L. Weber, G. I. Wright, F. B. Davenport representing C. E. Bennett; C. L. Gerhardt representing G. W. Saathoff, and E. G. Sohlberg.

Extended discussion was given to the subject of ventilation. Table No. 6 of last year's committee's report was expanded to show the computed temperature rises at 100 per cent and 125 per cent rated load. The handbook figures for watts per square foot radiation per degree centigrade were found to differ from actual test results. This was thought to be because test figures took into account not only radiation, but absorption by the building structure as well. It was decided to use a figure of 0.450 and compute the temperature rise at 100 per cent rating on the basis of this figure.

This year's assignment on ventilation provided for a study of the conditions under which natural ventilation was desirable on the one hand and forced ventilation on the other. In view of the very great variation as to air temperatures, size and construction of buildings, loads to be carried, etc., it was felt that no definite line of demarcation could be drawn and that the report should state the various factors to be considered when designing the scheme of ventilation, and only in a general way the conditions requiring forced ventilation.

Graphs have been prepared for 600-volt rectifiers and converters for both 25 and 60 cycles. The difference in the two was found to be due to the difference in transformer design. Since transformer efficiency can be varied by design and since the efficiency of the rectifier itself is independent of the frequency, it was desided to use one curve for both 25 and 60-cycle rectifiers. It was decided that this year's report should include a table showing the protection necessary or advisable for automatic operation of converters and rectifiers. A questionnaire has been sent out to a number of companies operating rectifiers in this country and answers from these will be tabulated.

Fire Prevention

RULES for employees were considered by the sub-committee on fire prevention of the American Association insurance committee that met at association headquarters in New York on April 8, with the following present: F. J. Petura, A. D. Knox, J. H. Moran, N. H. Daniels, B. L. Tomes and H. B. Potter, chairman.

The committee discussed the "Rules for Instructions to Employees for Fire Prevention" which are given in Manual Section B100-23, and decided that mention of this section should be made in its report. A complete discussion on the subject of fire prevention was held and at its conclusion it was decided that each of the sub-committee members would submit a draft of a report for use in preparing the final report.

The committee also considered the replies that had been received to the insurance questionnaires sent out some time ago, and urged prompt compliance with the committee's request to fill out and return these questionnaires at the earliest possible moment.

Hotel Reservation Blank for Cleveland Ready

APPLICATIONS for hotel reservations for the convention of the American Electric Railway Association at Cleveland, Ohio, next October, together with a statement of rates at the various hotels during the period of the convention, will be mailed from association headquarters in New York early during the week commencing April 25.

Bus Operation

MEMBERS of the committee on bus operation of the Transportation & Traffic Association met in Chicago on April 8 to discuss progress reports of the four sub-committees. The one on fares and fare collection was presented in a letter from E. D. Dreyfus, its chairman. It was the opinion of the members in attendance that this report should contain the practices of operating companies in establishing, determining and collecting fares. It was the thought of R. N. Graham, chairman of the main committee, that if the expressions of opinion of the members were incorporated in a report it would materially benefit present and prospective operators of bus lines, both city and intercity.

Out of questionnaires sent out to 51 companies operating buses, 46 have been returned, according to Mr. Graham. Material in these answers would assist the sub-committee in preparing a more comprehensive report on the subject of fares. D. L. Fennell, Kansas City, suggested that the sub-committee study the question of fares and perhaps work out a formula by which it would be possible to establish equitable rates for various bus services. A. R. Myers, Erie, Pa., suggested that the sub-committee work out such a formula based upon the density of population, riding habit and amount of service.

All of this discussion resulted in a motion by P. E. Wilson, Cleveland, that the sub-committee be directed, first, to analyze the data on fares and fare collection as contained in the questionnaires; second, to summarize this information for city, interurban and charter service, and, third, to make recommendations as to a definite policy to be followed by member companies. It was the opinion of the committee that the rate of fare must be based on the cost of service and should not follow in the footsteps of the early electric railway fare which was based upon a coin, rather than upon the cost of service. Mr. Fennell stated that now is the time for the electric railway industry to break away from the old practice of a coin for a fare. As this subject was considered the most important of the four, Mr. Graham increased the membership on the sub-committee by adding to it H. M. Bollum, Minneapolis; A. R. Myers, Erie, Pa.; Adrian Hughes, Jr., Baltimore; H. G. Monger, Milwaukee, and B. W. Arnold, Highwood, Ill. These men were asked to write to Mr. Dreyfus and co-operate with him and D. A. Scanlan in preparing a comprehensive report.

Progress reports were read by the sub-committees on equipment; methods, practices and economics of bus operation, and bus operating rules and instructions to personnel. Discussing the latter subject, Mr. Wilson made a motion that the program committee be requested to make arrangements for D. A. Scanlan, Akron, Ohio, to give a demonstration at the Cleveland convention of the Northern Ohio Traction Company's school for bus drivers' instruction.

Members present at the meeting included R. M. Graham, chairman; B. W. Arnold, vice-chairman; D. L. Fennell, S. W. Greenland, M. L. Harry, Adrian Hughes, Jr., H. M. Bollum, Thomas Noonan, E. S. Pardoe, members, and Paul E. Wilson and A. R. Myers, sponsors.

News of Other Associations

Traffic Congestion a Paramount Issue

CITY governments have thus far failed to take adequate steps to cope with the traffic problem, according to speakers at a conference held under the auspices of the National Automobile Chamber of Commerce at Chicago on April 13. Mayors, safety commissioners and other city officials were gathered there to consider the problem of traffic regulation from the executive standpoint. Various speakers emphasized the fact that traffic congestion has ceased to be merely a petty annoyance and has now become a major economic problem. Traffic is increasing so rapidly that a situation is likely to arise in a few years requiring the expenditure of much larger sums to provide relief than will be needed if the problem is attacked now.

Every city of 25,000 or more population should have at least one official whose sole duty it is to devote his time to traffic problems, according to Miller McClintock, director of the Erskine Bureau of Street Traffic Research. Congestion has reached its present seriousness, he said, because municipal officials have not attacked it with the same success that they have had in tackling other problems.

A discussion of signals and signs was led by E. J. McIlraith, staff engineer Chicago Surface Lines. Automatic signals, he said, are preferable to traffic policemen wherever conditions justify the expense. To be of any value, however, these signals must be properly timed. Too many cities buy signals like so much hardware and stick them up where it is most convenient, with little regard for time intervals or their relation to other signals. He urged municipal officials to obtain competent engineering advice before signals are installed. Co-ordination of lights to permit continuous flow of traffic at a certain specified speed is the latest development in traffic signaling, he said. This is putting a much needed curb on the driver who endeavors to "beat the lights."

The traffic problem is likely to get worse before it gets better, in the opinion of J. Rowland Bibbins, consulting engineer, Washington, D. C. He pointed out that the private automobile is not the only phase of the problem, but that freight transportation, which has not been greatly developed yet, looms large in the picture of the future. Local freight transportation will tend more and more to use the public streets, he said. He suggested that the best way to speed up traffic is by segregating it by classes, making some streets available for rapidly moving vehicles and others for slow, heavy trucking. Mr. Bibbins' paper appears in abstract elsewhere in this issue.

Central Electric Traffic Association

IN ACCORDANCE with the action taken, the Central Electric Traffic Association will hold its next regular meeting at the Tuller Hotel, Detroit, Mich., May 18 and 19. The opening session will be called to order at 9 a.m. Eastern Standard time.

Members are requested to submit subjects for discussion to the secretary as soon as possible in order that the docket may be mailed from his office not later than May 2.

C.E.R.A. Program Discussed

SUBJECTS for the summer meeting of the Central Electric Railway Association to be held at Detroit, June 29-July 1, were discussed at a meeting of the program committee of the association held in Cleveland, Ohio, on April 15. All members were present.

The tentative program includes a session on track construction and maintenance, with a talk on the general subject of standardization and elimination of waste; a session on better business methods for electric railways, city, interurban passenger and freight; one on electrical overhead construction, and one on financing. An address is planned for Wednesday evening.

Entertainment proposed includes a trip through one of the automobile plants in Detroit on Wednesday afternoon; a boat trip to Bob-Lo Island, with a golf tournament, on Thursday afternoon, and a dinner-dance Wednesday evening. A trip around Detroit by motor coach for the ladies is also planned for Thursday morning.

Central Master Mechanics

MAY 11 and 12 the Central Electric Railway Master Mechanics' Association will hold its next regular meeting at Pittsburgh, Pa. The session of May 11 will be called to order at 9 a. m., Eastern Standard time, at the Webster Hall Hotel. The morning session will be taken up with reports from committees and many important matters are up for discussion by the membership.

At 2 p.m. the same day members will visit the shops of the Pittsburgh Railways, where an opportunity will be given to see the new Pittsburgh car washing system.

On the morning of May 12 there will be a visit to the plant of the Westinghouse Air Brake Company and in the afternoon the Westinghouse Electric & Manufacturing Company's plant will be visited.

Platitudes Will Not Solve Traffic Problem

TOO much guesswork about our traffic problems, too many attempts to apply quick cures based on opinion rather than detailed engineering study, were reasons assigned for the failure of most American cities to deal more effectively with the problems of traffic congestion by Miller McClintock, director of the Albert Russel Erskine Bureau for Street Traffic Research, speaking April 15 before the first annual Central States Safety Congress, held in Kansas City.

"Those who would solve the American city traffic problem by some vague formula are as certain to be disillusioned as the takers of patent nostrums which claim to cure all human ills," said Dr. McClintock. "Until American officials are willing to recognize the traffic problem for what it is—a detailed and complex engineering problem—little progress will be made.

"There is no single panacea for so complicated a situation. In fact, it may be said that there is no solution for the traffic problem. There is, however, a series of reliefs for it. An engineer taking charge of a complicated machine that has not been properly lubricated turns his attention to oiling the various bearings of the mechanism in order that the friction from a large number of sources may be reduced. So in dealing with the traffic problem of a great city it is impossible to attempt to bring a solution by the application of some general formula or single remedy. It is necessary to make a minute investigation of the sources of friction and to treat each individual contributor to the general problem in an individual and specific manner.

"Before the public can be educated in methods of street traffic operation which will relieve congestion and add to safety it is first necessary to develop the principles that should be taught. Once careful investigation in each particular city has been made there can be formulated a simple and uniform code of traffic regulation.

"Until this is done vague and general educational programs on public safety matters related to traffic can be of little value."

The News of the Industry

Passengers Petition Before Massachusetts Commission

The petition of passengers for decreased fares on the Boston & Worcester Street Railway was recently heard before the Public Utilities Commission. Edward R. Goodwin, who appeared for the petitioners said that the officials of the railway had increased the fares from 5 to 6 cents a zone on Feb. 15, 1927. He declared the Boston & Middlesex line, which serves Natick and Wellesley, charges 10 cents to Newton, while the Boston & Worcester charges 24 cents for the same trip. School children's tickets were also raised at the same time from 5 to 6 cents. For the railway, F. C. Lewis stated that the commuters' books had not been changed, the rate still being 3.7 cents per zone. James F. Bacon, counsel, pointed out that the company had lost $90,000 in the two years of receivership. Patrons had also appeared in protest of bus operation, in installing which the company had difficulty because of the necessity for securing the commission's permission. Bus service, he thought, would remedy some of the trouble. Decision was reserved.

Philadelphia Transit Plan Would Cost $519,300

Immediate extension of nine trolley and bus lines in various sections of the city of Philadelphia, Pa., is part of a recommendation made to the Public Service Commission on April 19 in a report filed by its Bureau of Engineering. The extensions cited as vital in 1927 by F. Herbert Snow, chief engineer of the commission, would entail a capital outlay of $519,300 by the Philadelphia Rapid Transit Company and additional operating costs of $287,950 a year. Dr. Snow's report follows a three months' exhaustive survey of the transit situation. The document is preliminary to a report which will cover criticism of existing service and a discussion of the taxicab situation, one-man trolleys and other phases of the Philadelphia Rapid Transit Company operations. In the increased service outlined by Dr. Snow 32 additional cars and two more buses would be required.

No Progress Reported in Seattle Revision Deal

Regarding the present negotiations of the city of Seattle, Wash., with the Puget Sound Power & Light Company for an extention of time for the payment of the principal of the bonds issued to that company when the city took over the local railway, Mayor Landes states that she has been assured that it would be impossible for the city to sell power to the railway at ½-cent a kilowatt-hour, as suggested by A. W. Leonard, president of the power company, in placing the offer for extension before the city. She states, however, that it is believed the power can be furnished at less than 1 cent, the present rate.

Los Angeles Interurban Fares in Effect for Four Months

In an order issued recently the California Railroad Commission authorized the Pacific Electric Railway, Los Angeles, Cal., to place in effect on one day's notice new rates of fare on its Glendale-Burbank line, the basis for determining these to be:

1. One-way fares shall be based on 2 cents per mile, using the nearest 5-cent multiple, minimum fare 10 cents except where the present one-way fare is 6 cents no change shall be made in such fare.
2. Round-trip fares shall be double the one-way fare where the one-way fare authorized herein is less than 15 cents. Where the one-way fare authorized herein is 15 cents or greater, the round-trip fare shall be 5 cents less than double the one-way fare.
3. Thirty-ride family commutation fares shall be 80 per cent of 30 one-way fares except that no 30-ride family commutation fares will be published between points where the one-way fare authorized herein is less than 15 cents.
4. Sixty-ride individual commutation fares shall be 120 per cent of the present 60-ride individual commutation fares except that no 60-ride individual commutation fares will be published between points where the one-way fare authorized herein is less than 15 cents.
5. Adjustments not specifically authorized in this order may be referred to the commission for determination.
6. These rates to remain in effect for a period of four months and longer if it is found that the revenue on this line does not lessen more than $4,000 per month, compared to the present revenue, but in no event are the temporary rates to remain in effect beyond the effective date of the decision on the original application.

The commission ordered the company to suspend during the pendency of those rates all ten-ride, week-day and monthly commutation fares now in effect on the Glendale-Burbank interurban line. The company was also ordered so to record the revenue that the effect may be analyzed.

The Pacific Electric Railway on Jan. 11, 1927, filed an application with the commission for an order granting permission to increase passenger rates and fares over practically all of its interurban and local railway systems. On March 8, 1927, authority was asked to put into effect, as a temporary experiment a schedule of reduced one-way, round-trip and 30-ride rates, with an elimination of all other commutation rates on a group of the shorter interurban lines.

During the hearings on the supplemental application, many of the communities protested the placing in effect of the proposed trial rates. Agreement was reached, however, between the applicant and representatives of the cities of Los Angeles, Glendale and Burbank that an experimental rate schedule as given above might be placed in effect on the Glendale-Burbank line.

Nebraska Company Seeks Higher Fares

The Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., has asked the Nebraska Railway Commission for authority to increase its railway fares from 6 cents, plus 1 cent for the second zone, to 10 cents, plus a 2-cent zone fare. It also desires to sell four tokens for 30 cents, good on either its bus lines or cars, and for a 10-cent bus fare with 2 cents added for the second zone, which begins at 45th Street. The new rates asked are the same as those charged by the Lincoln Traction Company, with which it comes into active competition on the north side.

The company has never paid operating expenses, but under the management of J. M. Bramlette has been improving. Mr. Bramlette says that during the last twelve months, on a business exceeding $46,000, the company came within $1,606 of expenses.

Change Reported in Piedmont & Northern Route

Plans of the Piedmont & Northern Railway, Charlotte, N. C., to extend its service to points in North Carolina have been materially changed, according to a semi-official statement. It is probable now that the proposed extension from Charlotte to Winston-Salem and Durham will be built through the counties of Stanly, Randolph and Chatham instead of by way of Salisbury and Lexington. This route is 50 to 100 miles south of the one first proposed and is practically a direct route between Charlotte and Durham. It would leave Salisbury, Lexington, Winston-Salem and Greensboro far to the north.

It is learned that the application of the company to the Interstate Commerce Commission of extension of lines has been withdrawn and the reason given is that holders of land along the right-of-way proposed from Charlotte to Lexington have asked prices that the company considers exorbitant. The Southern Railway, however, operates from Charlotte to Lexington and on to Greensboro, part of its main line, and from Greensboro to Durham and Goldsboro, its most important branch line. If the Piedmont & Northern were built that way it would parallel the Southern practically all the way.

Pennsylvania Senate Defeats Paving Bill

The Senate at Harrisburg, Pa., by a vote of 22 affirmatives and 25 negatives on April 11 defeated the bill of Senator Painter which would exempt electric railways from paving for a certain distance on either side of their tracks. A constitutional majority of 26 votes was needed to pass the bill.

1926 Payments Swell Chicago Traction Fund

Close to $50,000,000 is now held in the traction fund of the city of Chicago as a result of the payment on April 9 of $2,617,399 to the City Comptroller by the Chicago Surface Lines. The amount represents 55 per cent of the net earnings of the Chicago Railways and the Chicago City Railway for the year ended Jan. 31, 1927. The check from the Chicago Railways, which is now in the hands of receivers, was for $1,631,030, while that of the Chicago City Railway was $986,368.

Under provisions of the 1907 ordinance, which expired on Jan. 31, last, and was extended for six months by the City Council, the Surface Lines are required to contribute 55 per cent of their annual net receipts to the city, such funds to be used either for purchase of the lines by the city or for municipal subway construction. With the payments for last year and some $350,000 in accrued interest, the traction fund now amounts to $49,747,019. The city's share for 1926 is an increase of more than $500,000, or 23 per cent over the amount paid the previous year.

Rapid Transit Act Killed in St. Louis

The adjournment of the Missouri General Assembly before the Senate could vote on the measure caused defeat of the rapid transit enabling act for St. Louis, Mo. However, C. E. Smith, consulting engineer for the city, who has made a study of the rapid transit needs, has expressed the belief that the Mayor under the existing city charter has the power to appoint a commission, subject to approval by the Board of Aldermen, and to provide funds for a complete survey of the city's transportation needs, the drawing of a definite subway or elevated plan, and to do practically everything the defeated bill authorized.

The chief purpose of the dead measure was to grant the city the authority to designate subways and elevated systems public works, within the legislative definition of public works, and to assess part of the cost against property alleged to be benefited through the rapid transit system.

City Denies Claims in Omaha

Every claim made to the federal court with respect to the legality and the perpetuity of the franchise of the Omaha & Council Bluffs Street Railway is denied categorically by the city of Omaha in its answer to the suit filed by the Guaranty Trust Company, New York. On behalf of the bondholders the trust company contended that the franchise is perpetual and asked an injunction against interference with its rights or granting permits to bus lines. The answer of the city takes up each step in the corporate development of the company and alleges that in none of the transfers was the law obeyed. It is also claimed that the perpetual rights granted the original company were lost through foreclosure proceedings. The city also contends that the suit is prematurely brought since the city has taken no action to oust the company nor to issue permits for competing bus lines.

City Attorney VanDeusen proposes to test the matter in the state courts and will ask the Attorney-General to bring *quo warranto* proceedings to test the company's rights to use the streets, claiming its franchise expires in 1928. He has frankly pointed out, however, that the city must recognize that the company has occupied the streets for 60 years without molestation, and that court decisions are not strong in their support of the city's position.

Deathknell Probably Sounded for Boston "L" Legislation

The deathknell of all Boston Elevated Railway legislation for the present year was sounded recently when the House ways and means committee voted to report "reference to the next annual session" on the bill which has already been passed by the Senate to extend public control for fifteen years.

An order had previously been introduced by Alfred E. Bliss asking the Supreme Judicial Court for an advisory opinion as to the Constitutionality of proposals made sometime ago. The Bliss order would ask the Supreme Court to advise the Legislature on the following points:

1. If the period of the lease of the property and franchises of said company to the Commonwealth, as provided in Chapter 159 of the Acts of 1918, is extended for a term of years, may the General Court provide that the Commonwealth shall guarantee the payment of principal and interest of any securities of the company that the trustees may be authorized to issue for the purpose of effecting economies in the fiscal management of the company and of promoting more efficient service to the public?
2. Would the fact that such securities might be outstanding after the termination of said period of public operation and management render such a guarantee inconsistent with the sixty-second article of the amendments to the Constitution or any other constitutional provision?
3. Is it constitutionally competent for the General Court to exempt said securities in the hands of their holders from all taxes levied under state authority?
4. Is it constitutionally competent for the General Court to require the retirement of any class or classes of the company's stock by the exercise of the power of eminent domain, or otherwise?
5. Under any extension of the present system of public operation and management of said company would the provisions of the sixty-second article of the amendments to the Constitution apply to the receipts of the company during the period of such operation and management?
6. Would any such extension be repugnant to the provisions of the sixty-ninth article of the amendment to the Constitution of the Commonwealth?

As a result of the introduction of the order, the Senate laid on the table the bill for extending and improving rapid transit facilities in Metropolitan Boston, proposed by the Metropolitan Planning Division.

Railway Man Again Honored

J. P. W. Brown, vice-president and general manager of the Nashville Railway & Light Company, Nashville, Tenn., was recently elected president of the Chamber of Commerce of Nashville. This latest of his honors came to him in recognition of his public service record, which Nashville declared had not been exceeded by any other individual. In 1925 Mr. Brown was unanimously voted by all civic clubs to be Nashville's most useful citizen.

Seattle & Rainier Valley Makes Proposals

Proposal that it be relieved of the payment of a franchise tax after Jan. 1, 1927; that it no longer be required to carry policemen and firemen free, and that it be given an exclusive right to operate buses on Empire Way and Seward Park Avenue has been made to the City Council of Seattle, Wash., by the Seattle & Rainier Valley Railway. The railroad is already in arrears $70,000 on franchise taxes. It asks that the plan advanced by Councilman Oliver T. Erickson for the payment of this back tax be adopted. This plan provides that the income from transfers be converted and that the city agree that all such revenues be applied to franchise taxes already in arrears until the amount is paid.

In return for the concessions asked, the company agrees to pay up its delinquent franchise taxes, to reduce from 10 cents to 8⅓ cents, the fare charged for rides which include right of transfer to the municipal railway, giving the city a larger share of the fare collected in these cases, and to do certain paving between its tracks.

Date Set for Oral Arguments in Indianapolis Labor Case

The Indiana Public Service Commission has fixed April 29 as the date for oral arguments in the arbitration case of James Green, an employee of the Indianapolis Street Railway appealing to the commission on grievances including wages, working hours and changes of contract.

As a closing argument recently in support of his claim for arbitration of wage disputes the employers have submitted affidavits to the commission purporting to show that the railway actually earned $9.75 on each share of preferred stock last year. This was in contradiction to the report filed by the company with the commission. Howell Ellis, commissioner, directed the accounting department to study the two statements.

No-Accident Week in Boston a Success

The "no-accident week" conducted by the maintenance department of the Boston Elevated Railway, Boston, Mass., from March 7 to 12 was marred by only two accidents, as compared with four for the corresponding week of 1926. For the purpose of stimulating competition the department was divided into fourteen units, as follows: Surface lines, road; surface lines, Division 2; surface lines, Division 3; surface lines, Division 4; surface lines, central; rapid transit lines, road; building; equipment; service cars; signal division; tie and timber; George Street yard; steel erection; welding. All of these were free of accidents for week, excepting "equipment" and "tie and timber," each of which had one minor accident. There were 1,100 employees this year, as compared with 1,125 last year, therefore the ratios of employees to accidents were 555 this year and 281 last year.

Hearing on Binghamton Fare Petition

A public hearing was held on April 19 before Commissioner Brewster on petition of the receiver for the Binghamton Railway, Binghamton, N. Y., to increase fares on its lines in Binghamton, Endicott, Johnson City, Fort Dickinson and intervening territory. The present fare is 7 cents. The company seeks an increase to 10 cents cash fare or ten tickets or tokens for 75 cents. The commission is petitioned to "fix such other rate of fare as will in its judgment result in a fair return on the minimum possible value of the property determined in any way that the commission desires."

The city of Binghamton was represented by Herbert H. Ray, first assistant corporation counsel, who objected to the proceeding on the ground that the commission had no jurisdiction inasmuch as an action is now pending in the courts as to franchise limitation of fare in Binghamton. Mr. Ray said briefs in this proceeding would be filed with the Court of Appeals within a few weeks and argument would be made within ten days thereafter. Testimony was presented by Elmer F. White, auditor of the railway, as to the accuracy of statements filed with the petition. The villages of Endicott, Johnson City or Fort Dickinson were not represented. Adjournment was taken to May 16 at Syracuse in the Courthouse.

Property Owners Demand Trolley

Residents of the Gravesend section of Brooklyn prefer electric railway service to bus service so strongly that they have just helped subsidize an abandoned rail line to get it.

The line involved runs from Avenue U to Nostrand Avenue. It was abandoned some time ago by the Brooklyn-Manhattan Transit Corporation. Residents pleaded for return of service, and when the Brooklyn-Manhattan Transit suggested installation of a bus service they protested. Finally the Brooklyn City Railroad agreed to operate cars if the residents would put the track in condition. This they gladly agreed to do, putting up $10,000 for expenses. Service started on April 16.

Prospective Car Service Between Camden and Philadelphia

That the Philadelphia Rapid Transit Company, Philadelphia, Pa., is ready to start negotiations for the right to operate cars across the Delaware River Bridge between Camden and Philadelphia was announced on April 15 in a statement by W. K. Myers to the Bridge Joint Commission. Mr. Myers told the commission that the company had made an agreement with the Public Service Railway to lease the tracks recently authorized by the Camden City Commission in Fourth, Fifth and Mickle Streets on the New Jersey side. These would be connected with the bridge tracks and operated by a subsidiary of the Philadelphia Rapid Transit Company. Following a discussion of present and future toll rates the commission referred the proposal to the executive committee for future hearing. The decision was approved at the March meeting of the commission to notify the Penn-Jersey Rapid Transit Company, another P.R.T. subsidiary, that the bus operating agreement for the bridge would terminate July 1.

One-Man Car Study in Washington

The Public Utilities Commission of the District of Columbia began a study on April 16 of statistical data on the operation of one-man cars in the principal cities of the United States. This is in view of the warning of the Capital Traction Company and the Washington Railway & Electric Company that only an extended use of this type of car in the district would forestall an increase in fare. The former commission placed itself on record as opposed to any increase in the number of one-man cars.

Court Reduces Railroad's Highway Assessment

Assessments against the Missouri Pacific Railroad by Road Improvement District No. 1 of Franklin County, Ark., for the construction of a new highway obviously were arbitrary and excessive. So the United States Supreme Court held on April 18, thus upholding the lower court, although the case was reversed and remanded with instructions for new proceedings to determine the amount the railroad properly might be charged. The assessment was $75,686 and the Supreme Court holds that it should not have been in excess of $15,000. Rolling stock and other equipment of the railroad were included in the assessment. The high court held that while the railroad will benefit by the highway, in increased traffic, it also will have losses through automobile competition. It is left to the lower court to determine how much, within the maximum of $15,000, the railroad should pay.

Fitchburg Company to Operate Over Worcester Abandoned Line

The Fitchburg & Leominister Street Railway, Fitchburg, Mass., has decided to operate over the recently abandoned line of the Worcester Consolidated Street Railway between Fitchburg and Leominster for a 30-day trial to begin April 24. No attempt will be made to re-establish the service between Leominster and the Summit in Worcester.

News Notes

Excursion Season On.—The Interstate Public Service Company started on April 3 its first excursion of the season from Louisville to Indianapolis. These excursions have become a regular institution with the Interstate patrons. The excursions alternate each Sunday, the one on April 10 running from Indianapolis to Louisville. To advertise this service the company used four billboards located in various parts of Indianapolis, where thousands of people look upon them daily. The railway department has prepared a very attractive envelope enclosure that is being mailed out to about 2,500 producers and manufacturers in Louisville and Indianapolis.

Would Discontinue Service on One Line.—The Pacific Electric Railway has applied to the California Railroad Commission for permission to discontinue service, and to remove its tracks on its Urbita Springs line in San Bernardino County.

Token Sale Discontinued.—The Capitol District Transportation Company, Inc., bus subsidiary of the United Traction Company, Albany, N. Y., by special permission of the New York Public Service Commission discontinued on April 1 the sale of five metal tickets for 35 cents, each token good for one 7-cent fare. The company has an application pending for a 10-cent fare.

Fares Increased.—Application of the Bamberger Electric Railroad for an increase in passenger fares between Salt Lake City and Ogden has been granted by the Public Utilities Commission of Utah, on the showing that the gross income of the road has decreased from $184,597 in 1920 to $89,344 in 1926. The commission authorized an increase in both one-way and round-trip fares, amounting to approximately ¼ cent a mile. On this basis the one-way fare between the two points will be raised, effective April 17, from $1 to $1.10, while the round trip rate will advance on the same date from $1.80 to $2. The increase does not in any way affect student fares, commutation fares and mileage books.

Motorman Pardoned.—Peter Tabor, a motorman on the lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., who had been sentenced to one year imprisonment for manslaughter in connection with an accident in which his car ran into a fire truck, killing one fireman and injuring several others, was granted a pardon recently by order of Governor Zimmerman. One newspaper had published a front-page editorial article stating that the punishment was too severe and alleging that the fire department was as much to blame for the accident as the motorman.

Ordinance Amendment Introduced.—At the request of the Pacific Northwest Traction Company, an ordinance has been introduced in the City Council of Seattle, Wash., amending the measure passed several months ago whereby the company was granted an extension of franchise to Jan. 1, 1950, and given the right to continue operation of its cars over the Westlake-Greenwood-Phinney Avenue municipal line and to extend its tracks on Stewart Street to its new terminal building at Eighth and Stewart. The proposed amendment provides that in event the city in the future should construct an elevated or subway along the route and require the railway to use the structure, the charge to the company should not exceed 25 cents per car-mile for the elevated or 40 cents for the subway.

Recent Bus Developments

Service Grows in Westchester

Leverett S. Miller, president of the County Transportation Company, a subsidiary of the New York, Westchester & Boston Railway, says the company's buses have been exceptionally well received and well patronized. Tentative plans are announced for electric railway abandonment in the Sound section of Westchester and the installation of motor coach service throughout this area of suburban cities and villages. Port Chester, N. Y., is the projected hub of the system. The carhouse of the New York & Stamford Railway in Port Chester is being converted into a modern terminal garage that will house upward of 74 motor coaches.

During March the County Transportation Company, a subsidiary of the New York, Westchester & Boston, made its appearance in the field of motor bus transit. On April 3 the local railway lines of the New York & Stamford Railway in Port Chester were abandoned and motor coach service was installed. On April 14 the County Transportation Company installed motor coach service for Milton Point in the Rye-Harrison-Rye Beach section of the county.

Indianapolis Street Railway Takes Over Peoples Motor Coach

The Indianapolis Street Railway, Indianapolis, Ind., asked permission of the Public Service Commission on April 16 to buy stock of the Peoples Motor Coach Company for $500,000. Filing of the petition followed agreement on the terms of sale between the railway and A. Smith Bowman, president of the coach company.

The petition declares that the street car company will merge the bus company and the railway to give the citizens of Indianapolis "adequate, sufficient, city-wide, comprehensive public service" and pledges that additions and extensions to the bus transportation system will be made "as public convenience and necessity may require." Due to independent operation, says the petition, there has been "a substantial and unnecessary duplication of expense" in furnishing required transportation, "which duplication could be eliminated by operating under a single management and with a single organization."

Robert I. Todd, president of the Indianapolis Street Railway, stated that the railway company was taking the Peoples Motor Coach Company over "as is." The present 10-cent fare schedule will remain in force until it can be determined just what has to be done.

The petition sets out that the railway company now operates about 30 buses and that the Peoples Motor Coach Company operates about 40 buses. The annual gross income of the motor coach company from passenger receipts is given as $425,000, and the net income as $15,000. Mr. Bowman said:

> Terms were agreed upon by the stockholders only with the distinct understanding that the present organization would be continued and the present service improved and extended. It will be a distinct advantage to Indianapolis if the present motor bus transportation provided by both the street railway company and the Peoples Motor Coach Company can be organized and operated together, with promise of such extension of lines and increase of service as shall be required by the growth of the city.

Charter Change in Louisville to Permit Bus Operation

Stockholders of the Louisville Railway, Louisville, Ky., have been asked by the directors to authorize a change in the charter of the company to enable it to operate buses, according to a letter sent out by James P. Barnes, president. This does not mean necessarily that the railway will go into the bus business, Mr. Barnes said. Buses are now operated through the Kentucky Carriers, an affiliated company.

The amendment which is proposed follows:

> 1. To operate direct or through subsidiary buses and other automobile vehicles supplementary to and also in co-ordination and conjunction with its rail lines for the carriage of passengers and freight within and without Louisville, Ky., to any extent that it may from time to time acquire local operating rights to do so, whether upon streets served with rail street cars or not so served to the end that it may furnish complete and comprehensive transportation for Louisville and its vicinity.
> 2. To acquire, buy, sell and transfer franchise and other operating rights.
> 3. To borrow money from time to time and to pledge its property and franchises to secure the various loans made by it.

Amended Contract Delays New York Bus Franchise

Another delay in the matter of awarding franchises for bus operation in New York City was necessitated on April 21 by the decision of the Board of Estimate to change the proposed form of franchise contract to give better protection in case the city should decide to recapture. Four weeks will be required under the law to advertise an amended form of contract. The board has set May 19 as the date when the bus matter will next come officially before it.

"Rubberneck" Service in Kansas City

Sightseeing bus tours of Kansas City are to be started on May 1, to run on twice-daily schedule and to begin each trip probably at the Union Station, according to a recent announcement of the Kansas City Public Service Company, operator of the railway and bus system.

The company will begin the service as the Kansas City unit of the Gray Line Motor Tours Association, under exclusive rights in the city.

Two buses will be assigned to the new service at the beginning. One of these, a single-deck coach of the street car type, and the other, a parlor coach, will start at 9.30 each morning, negotiating a 12-mile tour of the city in approximately one hour; beginning at 2 o'clock each afternoon one of these buses will cover a 25-mile tour in about 2½ hours.

Buses on Non-Profitable Runs.—The California Railroad Commission has granted a certificate to the Napa Valley Bus Company to operate auto stage service connecting Calistoga, Napa County, and Vallejo, Solano County, to be co-ordinated with the operation of train service by the San Francisco, Napa & Calistoga Railway, of which the bus company is a subsidiary. It is proposed to operate bus service in place of a number of non-profitable trains during the off-hours of traffic during the day, as a matter of economy to the railway and of convenience to the public. The commission denied the application of the California Transit Company for a certificate to operate auto stage service betwen Vallejo and Calistoga, finding the contention of public opinion in the Napa Valley that an unlimited bus competition would work disastrously to the railway is well grounded.

Petitions for Renewal of Bus Certificate.—In a petition filed with the Michigan Public Utilities Commission the South Shore Motor Coach Company sought renewal of the certificate of convenience and necessity granted in May, 1925, to operate intrastate passenger service between Benton Harbor, Mich., and the Michigan-Indiana state line, a distance of approximately 40 miles. This company is owned jointly by the Gary Railways and the Chicago, South Shore & South Bend Railroad. The recent service over this route, which is a part of a through route between downtown Chicago and Muskegon, Mich., consists of eight trips daily each way. Licenses for 35 motor coaches to be operated under the local permit are also sought in the company's application.

Bus Line on Madison Avenue Wanted.—A suggestion that Madison Avenue, New York City, be cleared of surface car tracks to make room for a bus line to be established for operation on Park Avenue was made on April 17 by the Fifth Avenue Association in a letter to the Board of Estimate. The association asked the board to delay decision on the award of bus franchises until the city had acquired the property and franchise rights of the Fourth and Madison Avenue surface lines, which have been offered to it by former Comptroller Charles L. Craig. The latter has options on this line and on the Ninth and the Eighth Avenue surface lines. The letter expressed general condemnation of the proposed bus system awaiting action by the Board of Estimate, in its discussion of the effect of the proposed crosstown routes on traffic on Park Avenue.

Asks Permit for Bus Line.—The Duluth-Superior Coach Company, a subsidiary of the Duluth Street Railway, Duluth, Minn., has asked for permission to operate a bus line between Superior and Duluth over the new Arrowhead bridge. The distance of the route is four-tenths of a mile. The company proposes to charge a 25-cent fare. The Minnesota Railroad and Warehouse Commission has taken the application under advisement.

Financial and Corporate

$2,500,000 Power Plant Sale at Kansas City

The sale of the power plant of the Kansas City Public Service Company, operator of the railway at Kansas City, Mo., was arranged between William G. Woolfolk, president, and Joseph F. Porter, president of the Kansas City Power & Light Company, purchaser of the plant, in a conference on April 14. The purchase price is announced as $2,500,000. Once the sale has been ratified by the Public Service Commission the railway will purchase power from the light company.

Anticipating the possibility of such a sale, the City Council inserted a provision in the recently voted railway franchise that any amount realized from the sale of the plant should be reinvested in the company's property within a period of twelve months.

According to Chester C. Smith, vice-president of the light company, two new frequency changers will be installed in the railway's plant, with a view to operating the railway from the Northeast power plant of the company in low-demand hours in the mornings. This would make it possible to shut down the railway plant six hours.

The amount to be realized from the sale is in addition to a sum of more than $1,250,000 which remains in the hands of the United States Court for the use of the company, said to be available within the next 60 to 90 days, after a similar amount in first mortgage bonds has been distributed among the personal injury claimants against the predecessor company, the Kansas City Railways.

Syndicate Takes B.-M.T. Bonds

Brown Brothers & Company, the Bankers Trust Company, J. & W. Seligman & Company and Hayden, Stone & Company, New York, were the purchasers of the $10,262,200 Brooklyn-Manhattan Transit Corporation 6 per cent bonds, due 1968, sold on April 19 by the War Finance Corporation. The bonds probably will not be offered to the public for several weeks.

The bonds acquired by the syndicate represent the balance of $19,000,000 bonds acquired by the War Finance Corporation on the reorganization of the B.-M. T. in 1923. The War Finance Corporation advanced $18,000,000 to the B.-M. T. in 1918 and on the reorganization acquired the $19,000,000 of bonds together with 25,000 shares of no-par $6 preferred stock in the B.-M. T. The preferred stock is still held by the War Finance Corporation.

Increased Excise Tax Bill Before Ohio Governor

The Ohio Legislature has passed the bill increasing the excise tax on certain public utilities from 1.2 per cent on gross intrastate receipts to 1.5 per cent. The bill is now before the Governor for his consideration and signature.

The utilities excise tax bill was a part of a program worked out by leaders of the Legislature to provide more revenue for the state. Other proposed items in the tax program include an increase in the gasoline tax of from 2 to 3 cents a gallon, an increase in the corporation franchise tax and the adding of ½ mill direct tax levy. The gasoline tax bill has passed the lower house. The direct tax revenue has passed both houses and the corporation franchise bill probably will be concurred in.

The increase in the excise tax will not affect electric railways as such, but will affect electric railways doing an electric light and power business.

International Utilities Would Buy Lethbridge Railway

An offer of $1,000,000 has been made to the city of Lethbridge, Alberta, Canada, by C. J. Yorath, Canadian representative, in behalf of the International Utilities Corporation, New York, for its 10½-mile railway system, electric light and power plants and all other capital assets. Another bidder for the Lethbridge Utilities is the Calgary Power Company. Both these proposals were turned down by the City Council.

Now the Calgary Power Company and the city are considering a proposal for co-operative conduct whereby the city would buy or sell power to the company as the situation warrants.

The International Utilities Corporation already controls the Canadian Western Natural Gas, Light, Heat & Power Company, familiarly known as the Calgary Gas Company, and the North Western Utilities, known as the Edmonton Gas Company.

Reorganization Terms Announced for Massachusetts Line

Conditions Reviewed Under Which Successor to Boston & Worcester Street Railway Will Be Organized—New Owners to Carry on Intensively, but Make No Predictions for Future

DETAILS have been announced of the plan for reorganization of the Boston & Worcester Street Railway, Framingham, Mass. The committee which drew the plan represents the first mortgage 20-year 4½ per cent gold bonds dated Aug. 1, 1903. Under the plan each depositor will receive the par value of his deposited bonds in new securities on the basis of 30 per cent in reorganization bonds, 30 per cent in preferred and 40 per cent in common.

The road appears to be in sore straits. This fact is not minced by W. Eugene McGregor, chairman of the bondholders' committee. Mr. McGregor says that the main problem of the officers of the successor company will be to adjust their policy to this situation created by the greater use of the private auto and the growth of the bus business. According to him the plan proposed provides means for the new financing necessary to convert "into realities whatever the possibilities may prove to be." While the situation is not such that the committee feels justified in making any predictions, there are possibilities. According to Mr. McGregor the fact that operation under receivership has shown a loss is neither surprising nor conclusive evidence of the future.

The chairman of the committee cites as bonds entitled to participate:

Boston & Worcester Street Railway first mortgage 20-year 4½ per cent bonds ($2,460,000 outstanding), accompanied by Aug. 1, 1923, coupons.

Framingham, Southborough & Marlborough Street Railway 5 per cent first mortgage bonds, dated Jan. 25, 1899 ($60,000 outstanding), accompanied by Aug. 1, 1923 coupons.

It is intended to form a new company in Massachusetts to acquire the property rights of the Boston & Worcester Street Railway and the property and rights, if any, now or formerly of the Framingham, Southborough & Marlborough Street Railway when sold under court authority.

The capitalization is subject to the approval of the Department of Public Utilities of Massachusetts. The engineer of the department has submitted a tentative estimate of $2,900,000. Using this as a basis, it is proposed that the new company shall have the following capitalization:

First mortgage 20-year 7 per cent bonds	$252,000
Reorganization bonds (to be secured by second mortgage)	756,000
Six per cent preferred stock	756,000
Common stock (an estimate merely, the total depending upon the total capitalization approved by the department)	1,388,000

A small amount, not exceeding $10,000, of 7 per cent prior preference stock may be issued. It is explained that this, if done, will be for the purpose of providing the directors of the new company with an additional possible medium for raising new money. It is further explained that under the Massachusetts statute it is important, if the use of such prior preference stock ever becomes practicable and desirable, that a few shares of such stock be issued at the beginning.

All the $252,000 of first mortgage bonds and part of the common stock are reserved for subscription, for the purpose of raising new money for expenses in connection with the receivership and reorganization, for working capital and for other purposes approved by the commission.

Bondholders who do not deposit their bonds will receive merely their pro rata share of the sale price less the expenses which are chargeable against this sale price. To provide the cash needed to pay non-depositing bondholders, a syndicate will receive in return for the cash furnished for distribution to syndicate participants whatever the non-depositing bondholders would have received, including the rights to subscribe for first mortgage bonds with the common stock warrants.

The remaining $126,000 of first mortgage bonds and the remainder of the common stock are reserved for sale if the directors determine that the proceeds are necessary for the purposes of the new company. If sold before Feb. 1, 1929, these reserve bonds (each with a proportionate amount of common stock reserved) are first to be offered to holders of the warrant previously mentioned. Bonds so reserved which are not sold before that date will remain available for issue by the new company, but the common stock reserved and not utilized before that date will be distributed to holders of the warrants proportionately.

Assuming that all bondholders deposit their bonds and that the whole of the first half of first mortgage bonds is subscribed, the distribution of securities (on the basis of a capitalization of $2,900,000 plus the first mortgage bonds) will be as follows:

First mortgage 20-year 7 per cent bonds sold $126,000; available for future sale $126,000; total..	$252,000
Reorganization bonds (to depositors on basis of $300 of reorganization bonds for each $1,000 of old bonds)	756,000
Six per cent preferred stock (to depositors on bonds of $300 preferred stock for each $1,000 of old bonds)	756,000
Common stock, to depositors on basis of $400 of common stock for each $1,000 of old bonds....	1,008,000
Bonus with first half of first mortgage bonds (estimated)	190,000
Reserved as bonus for second half of first mortgage bonds if sold before Feb. 1, 1929, otherwise to be distributed to holders of warrants (estimated)	190,000

It is explained that the amount of common stock available for bonus depends on the decision of the Department of Public Utilities as to the capitalization.

It will be recalled that Franklin T. Miller, receiver of the company, applied to the Massachusetts Supreme Court some time ago for permission to curtail electric railway operation. In order to give the bondholders time to consider the adoption of the plan, Judge Crosby of that court has continued the petition to May 3.

Abandonment Sought in Auburn

At a meeting of stockholders of the Auburn & Syracuse Electric Railroad on April 15 it was decided to abandon as soon as possible all the railway lines operated by the company in the city of Auburn and from that city to Lakeside Park. The action was taken at the recommendation of the directors following the annual report for last year, which showed a net loss of $87,684. Passenger earnings have dropped from $265,090 in 1920 to $162,730 in 1926.

Had the company wished to continue operation of its lines in Syracuse it would be forced to meet expenditures totaling approximately $290,000 for track relaying, repaving and replacements.

City officials have announced their determination to oppose the company's plea for abandonment before the Public Service Commission unless adequate bus service is guaranteed. The city is served now by buses supplementing the railway lines. No definite provision has as yet been made for new buses under operation of the Auburn & Syracuse or other concerns.

Conspectus of Indexes for April, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares* 1913 = 4.84	April 1927 **7.43**	Mar. 1927 **7.43**	April 1926 **7.36**	Fe 192 **7.**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	April 1927 **148.0**	Mar. 1927 **152.1**	April 1926 **154.2**	Sept. 1920 **247.5**	April 1927 **148.0**
Electric Railway Wages* 1913 = 100	April 1927 **226.9**	Mar. 1927 **226.7**	April 1926 **224.7**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Apr.1 1927 **202.6**	Mar. 1927 **203.0**	April 1926 **201.3**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	April 1927 **209.0**	Mar. 1927 **208.8**	April 1926 **207.0**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Mar. 1927 **145.3**	Feb. 1927 **146.4**	Mar. 1926 **151.5**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Apr. 1 1927 **12.53**	Mar. 1 1927 **12.55**	Apr. 1 1926 **13.11**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Mar. 1927 **153.8**	Feb. 1927 **156.0**	Mar. 1926 **159.9**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Mar. 1927 **164.1**	Feb. 1927 **165.2**	Mar. 1926 **168.5**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Mar. 31 1927 **3.553**	Feb. 28 1927 **3.597**	Mar 31 1926 **4.380**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Mar 1927 **19.53**	Feb. 1927 **16.72**	Mar. 1926 **19.66**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Mar. 1927 **1852** **97.90**	Feb. 1927 **1859** **65.42**	Mar. 1926 **1888** **47.70**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Refunding in Denver

Tramway There Also Cuts Amount of Bonds Outstanding by $848,000 —Review of Operation

Arrangements were made recently by the Denver Tramway, Denver, Col., to reduce the outstanding funded debt of the corporation by $848,000 through a refinancing program arranged with Boettcher & Company and the International Trust Company, Denver. The plan provides that all of the company's first mortgage extended 6 per cent gold bonds and first mortgage improvement extended 6 per cent gold bonds, due April 1, 1927, and totaling $2,598,000 be acquired from the holders.

Upon acquisition by the company all of the bonds will be extended, with the mortgage liens by which they are secured, until Oct. 1, 1933, and will be deposited as collateral with the International Trust Company, trustee, as security for a new issue of $1,750,000 to be known as the Denver Tramway 6 per cent first (underlying) mortgage collateral trust sinking fund gold notes, which will mature Oct. 1, 1933.

The difference between the $2,598,000 in old securities to be acquired by the company and the $1,750,000 of the new issue represents a reduction of $848,000 in the funded debt in the hands of the public. The source of the funds necessary for this reduction was not disclosed in the company's statement, but the money is understood to be available from a cash fund set up through assessments levied on common stockholders at the time of the tramway reorganization in July, 1925, and from money carried over from the reorganization and accumulation of depreciation reserves.

The material reduction in the funded debt will not only increase the equity for the general and refunding bonds and the preferred stock but there will be a substantial saving in annual interest charges, which will be utilized to reduce further the liens prior to the junior securities.

Holders of the maturing bonds were given preferential opportunity to acquire the new notes on a 6.25 per cent basis.

In describing the new notes the tramway statement said in part:

> The new collateral notes will be an unusually safeguarded medium-term investment at an attractive rate of interest, to be secured by a first lien on properties valued in excess of $5,900 for each $1,000 note, based on valuation of the United States district court, with earnings for 1926, before depreciation but after allowance for federal taxes, equal to 8.28 times the interest charges on all issues secured by underlying liens to be outstanding with the public after April 1, 1927.
>
> Under this plan there will be outstanding with the public only $2,552,000 principal amount of issues secured by underlying liens on Oct. 1, 1933. Such underlying liens are followed by $6,443,500 principal amount of general and refunding mortgage bonds; $10,416,400 par value of preferred stock and 61,240.8 shares (no par value) common stock, now outstanding in the hands of the public. The depreciated value of all properties owned by system, as of Dec. 31, 1926, was $27,445,668, based on court valuation of $23,514,769 for the city transportation properties as of Dec. 31, 1922.

The $2,000,000 of Denver City Tramway 6s originally matured in April, 1919, at which time the issue was extended to April, 1924, and the interest rate increased from 5 per cent to 6 per cent. In April, 1924, it was again extended to the present 1927 maturity with the 6 per cent interest continued. The bonds are a first mortgage on 103 miles and a second mortgage on 100 miles of the company's track.

The balance of the maturity is made up of $645,000 of Denver Tramway Power Company first improvement 6s, which originally came due in April, 1923, and were extended to April, 1924, also with an increase in interest from 5 per cent to 6 per cent. At the latter date a further extension to 1927 was secured.

Heaviest Traffic Ever

North Shore Road Again Breaks Records—Net Held Up Well —Improves Rolling Stock

Substantial progress was made in 1926 by the Chicago, North Shore & Milwaukee Railroad. According to the annual report of the company the volume of traffic, both passenger and freight, was the greatest in the history of the company and the gross revenue showed an increase of $718,197 over the previous year. The net income showed a decrease from the previous year of $49,203, owing to increased fixed charges resulting from heavy capital expenditures for additions to the physical property, particularly the building of the Skokie Valley route.

In 1926 the company carried 19,461,426 revenue passengers on its rail and auxiliary motor coach lines, an increase of 1,232,266 over the previous year. The freight business of the company totaled 656,754 tons, an increase of 120,659 tons over the previous year.

FACILITIES GREATLY INCREASED

The operating revenue was $7,568,362 and the gross income after deducting operating expenses and taxes was $1,814,290. The net income was $731,427. Dividends at the rate of 6 per cent on the $5,000,000 outstanding preferred stock and of 7 per cent on the $6,652,800 prior lien stock issued and outstanding amounted to $729,740. The report says:

> Construction of the new Skokie Valley route increased materially the fixed charges of the company, and while the new line greatly improved the Chicago-Milwaukee passenger service by reducing the running time of trains, and was a necessity because of the contemplated grade separation through the communities on the Shore Line route, some time will be required to develop the territory to make this line self-supporting.
>
> The outstanding feature of the year was the great increase in the facilities of the railroad to enable the company to give the public still better service, a policy which has been followed consistently under the present management.

COMPARATIVE INCOME STATEMENT OF CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD

	1916	1920	1924	1925	1926
Operating revenue	$1,157,191	$4,193,669	$6,198,987	$6,850,165	$7,568,362
Operating expense	714,887	3,229,048	4,650,030	5,066,956	5,644,846
Net revenue—Railway operation	442,304	964,621	1,548,957	1,783,209	1,923,516
Net auxiliary operating revenue	....	....	800	86,994	99,807
Net revenue from operation	442,304	964,621	1,549,757	1,870,203	2,023,323
Taxes assignable to railway operation	66,038	151,746	298,609	408,255	400,838
Operating income	376,266	812,875	1,251,148	1,461,948	1,622,485
Non-operating income	6,208	10,332	60,155	151,673	191,805
Gross income	382,474	823,207	1,311,303	1,613,621	1,814,290
Fixed charges	237,996	390,196	610,583	832,991	1,082,863
Net income	144,478	433,011	700,720	780,630	731,427

Among the improvements made by the company during the year and noted in the report was the installation of an electrically operated refrigerator car service, said to be the first of its kind in regular use on any electrically operated railroad in the country.

INCOME ACCOUNT OF CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD FOR YEAR ENDED DEC. 31, 1926

Operating revenue:		
Passenger and special car revenue	$5,772,023	
Freight and express revenue	1,299,413	
Miscellaneous revenue	496,924	
		$7,568,361
Operating Expenses:		
Way and Structures	$507,586	
Equipment	410,955	
Conducting transportation	2,469,514	
Power	577,801	
Traffic	300,354	
General and miscellaneous	1,378,633	
		$5,644,845
Net revenue from railway operation		$1,923,516
Net auxiliary operating revenue		99,807
Net revenues from operations		$2,023,323
Taxes assignable to railway operation		400,837
Operating income		$1,622,485
Non-operating income		191,804
Gross income		$1,814,290
Deductions from gross income		1,082,863
Net income		$731,427

STATEMENT OF SURPLUS

Surplus Jan. 1, 1926		$733,594
Add sundry adjustments, net		72,369
		$805,964
Net income, Jan. 1 to Dec. 31, 1926	$731,427	
Profit on sale of real estate	111,856	
	$843,283	
Dividends paid	729,740	
		$113,543
Surplus, Dec. 31, 1926		$919,507

A new method of handling freight in less than carload lots also was developed by the company during the year. It consists of specially built steel containers equipped with running gear, which after being loaded at the warehouse of the shipper are hauled through the streets by a tractor to the receiving stations of the railroad and there run on to flat cars to be hauled to their destination without having to dismount the bodies from the running gear. The method saves the time and cost of handling the merchandise at receiving stations.

ROLLING STOCK AUGMENTED

At the end of the year the railroad was operating 256 miles of single track, the opening of the new Skokie Valley route giving the company four main tracks from Chicago to Waukegan.

The company added to its rolling stock during the year twenty steel passenger coaches, three dining cars, five refrigerator cars and 24 freight cars. It now has a fleet of 47 motor coaches operating in connection with its rail lines and serving rural communities to a distance of 35 miles from the main railroad.

$2,904,600 of Cleveland Railway Stock to Present Holders

Notices have gone out to the stockholders of the Cleveland Railway, Cleveland, Ohio, about the proposed increase in the stock of the company and outlining their rights to subscribe. Rights adhere to holders of record of April 1 to subscribe at par for 10 per cent of the amount of stock previously held. Subscriptions are payable one-quarter or more on or before July 1, 1927, one-quarter or more on or before Sept. 1 and the rest in one or more installments on 60 days notice from the company. The right to subscribe expires on April 25. A syndicate will take such stock as is not subscribed by present holders.

As indicated previously in the ELECTRIC RAILWAY JOURNAL, the Public Utilities Commission has approved the issue and sale of $2,904,600 of stock. The purpose of the issue is to finance these improvements:

100 street cars	$1,200,000
50 motor coaches	600,000
4 automatic substations with equipment	1,000,000
West 117th Street operating station	350,000
Track in Pearl, State and Broadview Roads	262,000
Service buildings	207,500
Miscellaneous	20,000

The total of these items is $3,639,500, but the company has stock unissued but heretofore authorized by the commission sufficient to take care of the difference between the present issue and the total of the improvements listed.

Chicago & Interurban Suspends

Abandonment of operation by the Chicago & Interurban Traction Company, known locally as the "Kankakee Line," has been formally announced by W. W. Crawford, receiver. Service over its 54-mile route between 63d Street, Chicago, and Kankakee, Ill., will cease on April 23, at 11.59 p.m.

The Illinois Commerce Commission approved the abandonment in an order entered on March 9 and the Circuit Court of Cook County confirmed the authority in an order issued by it under date of April 12.

High operating costs and falling revenue due to the competition of automobiles and motor trucks and the greatly improved suburban service furnished by the Illinois Central Railroad as a result of electrification last summer are cited by the receiver as the reasons for the failure of the company to meet operating charges. Hard roads parallel the line practically its entire length. Wages paid employees are on the same scale as those of Chicago Surface Lines employees—a basis very high considering the character of the company's operations.

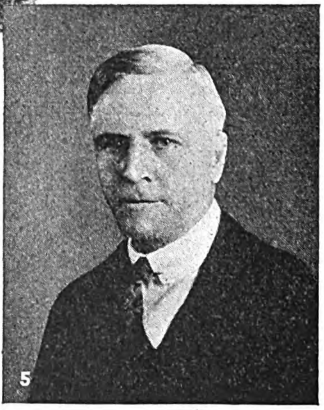
About 130 employees are affected by the abandonment order. Several independent bus companies, including the Schappi Bus Company of Calumet City, Ill., have been granted permits to operate in the territory previously served by the railway.

Personal Items

Who's Who in Kansas City

Careers Reviewed of Principal Operating Officials of the Successor Company to the Kansas City Railways—Subordinates in the Management and Operating Departments Already Serving

WHEN the Kansas City Railways receivership was terminated last fall and the property turned over to the new owners, the Kansas City Public Service Company, William G. Woolfolk, president of the new organization, published a list of the operating officials who were to serve under him. At the head of this list was F. G. Buffe, general manager of the property throughout the receivership, who was elected vice-president in charge of operations. The other officials were all retained, although the titles of some were changed. A list of the official roster was published in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 23, 1926, page 786. Now that the reorganization of the company has been completed and the recently announced personnel is conducting the affairs of the successor to the Kansas City Railways under the new franchise, brief biographies of the principal operating officials are appended.



No. 1, W. G. Woolfolk
No. 2, F. G. Buffe
No. 3, P. C. Groner
No. 4, C. L. Carr
No. 5, N. S. Doran

William G. Woolfolk
President

After graduating from the Sheffield Scientific School of Yale University in 1899 Mr. Woolfolk sought employment with the General Electric Company and was placed in its Schenectady office. With two years of experience in the drafting room, testing department and power and mining engineering departments he went with the Knoxville Railway & Light Company as its general superintendent in charge of operation and reconstruction. He served in this capacity for three years, resigning in 1905 to become superintendent and chief engineer of the Philadelphia & West Chester Traction Company, operating a high-speed interurban service.

In 1906 Mr. Woolfolk entered the employ of Sanderson & Porter, engineers of New York and San Francisco, as an executive engineer. He served as assistant to President E. N. Sanderson of what is now the Republic Railway & Light Company, transacting general light, power and gas business for urban and interurban railway service in Youngstown and Niles, Ohio; Sharon and New Castle, Pa., and surrounding territory. In this capacity he had charge of the operation and reconstruction of these properties.

In 1909 he became financially interested in the Old Dominion Development Company, developing, constructing and operating coal mines in Virginia. As vice-president of this company he not only managed the property but spent a great deal of his time in the mines directing the work of the men. Later he joined again the firm of Sanderson & Porter. That was in 1913. The following year this firm opened a Chicago office and Mr. Woolfolk was placed in charge as Middle Western manager. Because of his wide experience in engineering fields the United States government in 1918 appointed Mr. Woolfolk chief of section in the chemical and explosive division of the War Industries Board at Washington, D. C., and in 1919 he was retained by the government and devoted six months in charge of salvaging surplus material for the Emergency Fleet Corporation. He returned to Chicago in the fall of 1919 and founded the firm of William G. Woolfolk & Company, Inc., transacting a general engineering business. This firm is still functioning and Mr. Woolfolk is its active head.

During the last eight years Mr. Woolfolk has served as consulting engineer to many utilities. In the ordinary course of business Mr. Woolfolk was invited to serve as adviser to the reorganization committee of the Kansas City Railways. Following the formation of a new company Mr. Woolfolk was elected president. The committee felt it needed a man of his experience and ability to refinance and reconstruct the electric railway property of Greater Kansas City.

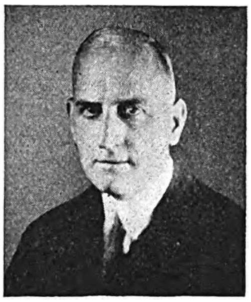
Fred G. Buffe
Vice-President in Charge of Operation

Fred G. Buffe, who was elected to the office of vice-president in charge of operation, entered the public utility field in 1908, being first employed by H. E. Chubbuck, then vice-president executive of the Illinois Traction System. He remained with this organization until 1917, first serving as publicity manager and later as assistant to Mr. Chubbuck. He went to the Kansas City Railways in 1917 as assistant to President Philip J. Kealy. In 1919, when James Gibson, general man-

A. E. Harvey

R. W. Bailey

D. L. Fennell


E. E. Stigall

H. H. Cloyd

ager of the property, resigned, Mr. Buffe was appointed general manager. He served in this capacity until the receivership, and one of the first official acts of Senator Wilson and Colonel Fleming, as receivers, was to select Mr. Buffe as their general manager. Last October when the new company took charge of the property he was appointed to his present official position.

The present official and operating organization of this property, recognized as one of the finest in the country, was organized and built up largely through Mr. Buffe's efforts. He is the author of the Employees' Representation Plan, inaugurated there in 1919, which has been copied and placed in effect in many other cities. Mr. Buffe was also responsible for the organization of the Brotherhood and many other employee co-operative activities extant on the property.

Mr. Buffe has a wide acquaintance in utility circles, and is well known throughout the United States through his activities in railway association work. He is the author of numerous papers and articles on electric railway and bus subjects and has addressed many meetings of railway executives and employees in the last ten years.

He was born in Franklin, Morgan County, Ill. He attended Whipple Academy and Illinois College and is a graduate of Illinois Wesleyan University and the Kansas City School of Law. Although admitted to the bar of Missouri, Mr. Buffe has never practiced.

After leaving college he engaged in newspaper work as reporter for the Denver *Post* and the Denver *News and Times.* Later he became part owner and managing editor of the Peoria *Herald Transcript.* It is this experience that has enhanced his reputation as a public speaker, made him one of the best public relations men in the electric railway industry and made his formal presentation of transportation subjects not only forceful but also colorful.

Powell C. Groner
General Counsel

Powell C. Groner acted as counsel for the reorganization committee of the Kansas City Railways and at the termination of the receivership was appointed general counsel for the present company. He is one of the youngest executives in the street railway field and his outstanding work in connection with the reorganization of this property stamps him as a brilliant corporation attorney.

He was born at Norfolk, Va., Feb. 13, 1892. He received his academic and law education at the University of Virginia, specializing in corporation and public utility law, and was graduated from that famous institution with the class of 1913. From the date of his graduation until 1922 Mr. Groner engaged in general practice in both New York and Chicago, representing the Fifth Avenue Coach Company, among others, during that period. In 1922 he joined the firm of Newman, Saunders & Company, Inc., public utility operators and investment bankers, and has been a member of that organization since then.

C. L. Carr
General Solicitor

Charles L. Carr became connected with the street railway property in October, 1918, as an assistant trial attorney and later became the trial attorney, trying cases in the trial courts and briefing and looking after same on appeals to upper courts.

When Clyde Taylor resigned as general counsel, the latter part of 1919, Judge Richard J. Higgins, who had been general solicitor, was made general counsel and Judge Higgins transferred Mr. Carr from the trial department to the general counsel's office as his assistant. Mr. Carr served in this capacity until shortly after the commencement of the Kansas City Railways' receivership on Sept. 9, 1920, when Judge Higgins resigned as general counsel and became attorney for the trustees under the first mortgage of the Kansas City Railways. At the same time Judge Kimbrough Stone appointed Judge James E. Goodrich as general counsel for the receivers and Judge Goodrich in turn selected Mr. Carr as his assistant.

Mr. Carr was born in Quincy, Ill., on April 1, 1890. He was graduated from the Quincy High School in 1909 and that same year entered the Northwestern University at Evanston and Chicago, Ill. He was graduated from the liberal arts department of the University at Evanston in 1913 and from the law department in Chicago in 1915. From October, 1915, until October, 1918, he was deputy circuit clerk of Kansas City, Mo., assigned to Division No. 3.

Rufus W. Bailey
General Superintendent of Maintenance

Rufus W. Bailey on Oct. 15 last assumed charge of the power generation and distribution departments, the way and structures, equipment and bus maintenance departments. In addition to these duties Mr. Bailey will supervise all methods and standards, the laboratory, power conservation, electrolysis investigations, surveys and studies. He went to the Kansas City Railways under F. G. Buffe as assistant to general manager in charge of the Kansas properties in 1919. Early in 1920 he took over the distribution work and in December of the same year assumed charge of the power plant. When H. S. Day resigned in 1922 Mr. Bailey took over the shops and mechanical departments and a little more than a year later, when R. L. Weber left the organization, the research and engineering departments were placed under his supervision.

Under Mr. Bailey's direction the power and equipment departments have reached a high state of efficiency, hundreds of improvements have been made both in working conditions and types of

J. D. Cornell

C. A. Kincade

L. R. Carson

H. M. Smith

H. W. Smith

machines used, and plant accidents have been reduced to a minimum. Many of the safety features incorporated on the buses purchased a year ago by the receivers were invented and patented by Mr. Bailey. He also has applied for patents on the new periscopes and loud speakers now in use on the Kansas City buses.

Mr. Bailey was born in St. Louis, Mo., on Aug. 22, 1877. He was graduated from the high school there and attended the University at Providence, R. I. During vacation periods he was employed by the old Sixth Street car line and the Olive Street line in St. Louis. For two years after leaving school he did erecting work for both the General Electric and Westinghouse companies out of St. Louis, building numerous electric light plants for them.

He served in Cuba throughout the Spanish-American War.

In 1909 Mr. Bailey joined the East St. Louis & Suburban Railway as superintendent of construction. He served in various capacities with this organization, finally being appointed general superintendent of the Alton Division. In this position he also acted as supervisor of a number of properties owned by the E. W. Clark interests. In 1907 he went with the McKinley interests in Peoria and was general superintendent there until he went to Kansas City in 1919.

Neal S. Doran
Comptroller and Assistant Treasurer

Neal S. Doran, comptroller and assistant treasurer of the Kansas City Public Service Company, first went to Kansas City in 1893 as auditor of the Texarkana & Fort Smith Railroad. He later was connected with various construction companies in building the Kansas City Southern Railway, the Suburban Belt Railroad and the Kansas City & Independence Air Line. He was appointed secretary and auditor of the Kansas City, Mexico and Orient Railroad at its organization in 1901 and continued in that same capacity until June 1, 1920. On that date he was appointed auditor of the Kansas City Railways and remained in that position throughout the receivership.

Mr. Doran was born on July 4, 1870, in Iowa. He received his education in the Pittsburgh, Pa., schools.

Ernest E. Stigall
Purchasing Agent

Ernest E. Stigall entered the employ of the Kansas City Railways & Light Company in May, 1904, in the accounting department of the light and power division. In 1909 he was appointed cashier and chief clerk of the light and power company and in May, 1911, was promoted to the position of purchasing agent for the Kansas City Railways & Light Company.

Following the granting of a new franchise in 1914, which provided for the separation of the Kansas City Railways from the light and power company Mr. Stigall was appointed purchasing agent for the Kansas City Railways and he has remained with the organization in the same capacity since that time.

Mr. Stigall was born in Stewartsville, Mo., on Dec. 24, 1883. He was graduated from William Jewell College at Liberty, Mo., in 1903 and in the same year went to Kansas City and took a course in Spalding's Commercial College.

A. E. Harvey
Chief Engineer

A. E. Harvey is a graduate of the University of Illinois, having received his degree in 1891. In 1894 he received the degree of C. E. from the University of Illinois. During his college vacation periods and for two years after graduating Mr. Harvey sought employment with firms where he could gain construction and engineering experience and in April, 1894, was employed by the Illinois Central Railroad in numerous capacities, from that of instrument man to division engineer and road master. In April, 1902, he entered the employ of the Chicago Great Western Railway as division engineer in charge of maintenance and construction. From April, 1905, until February, 1906, Mr. Harvey held similar positions with the Illinois Central Railroad and the St. Louis & Iron Mountain Railroad. In February of 1906 Mr. Harvey became associated with R. A. Elzy in the general railroad contracting business. From 1908 until 1910 Mr. Harvey was superintendent of the Western Division of the Chicago Great Western Railroad in charge of operation and maintenance and from 1910 until early in 1911 was division engineer for the Kansas City Southern Railway. In April, 1911, Mr. Harvey entered the service of the Metropolitan Street Railway as chief engineer and he has been on the property since that date in the same capacity but under different titles. At present he has charge of the construction work of the Kansas City Public Service Company.

Daniel L. Fennell
General Superintendent of Transportation

Daniel L. Fennell is the only operating official of the company who has never been employed by any other than the railway organizations of Kansas City. During his summer vacation periods of 1902 and 1903, Mr. Fennell was employed as a material clerk on track construction. In June, 1904, he entered the service permanently, being employed as a rodman in the engineering and construction department. While still in this department he served for several months as assistant foreman on track construction. In 1905 he was appointed time keeper and material clerk on track and power plant construction, remaining in this capacity until 1907, when he was transferred to the shops as chief clerk under the master mechanic.

It was on May 1, 1909, that Mr. Fennell joined the transportation department and his first position was assistant division superintendent at 48th and Harrison, the largest division on the property. On June 1, 1910, he was promoted and made division superintendent at 31st and Holmes, remaining there until Oct. 1, 1912, when he was transferred back to 48th and Harrison as division superintendent. The next promotion came on Dec. 13, 1913, when he was made secretary and assistant to the general superintendent. He was appointed superintendent of traffic on Dec. 1, 1916, and organized the present traffic and schedule department.

Mr. Fennell became assistant superintendent of transportation on May 16, 1918, and from Dec. 1, 1918, until March 1, 1919, served as acting superintendent of transportation. On the latter date he received a permanent appointment as superintendent of transportation, and since then has served continuously in the same capacity. For a number of years he has been an officer of the Kansas City Safety Council and the present success of that organization is in a great measure due to his efforts. He was also one of the organizers of the Mid-West Electric Railway Association and served as its first president. Mr. Fennell is 40 years of age.

Hardy H. Cloyd
Assistant to Mr. Buffe

Hardy H. Cloyd was first regularly employed as construction foreman for an Omaha contractor and in this capacity he had charge of the construction of a number of electric light plants in Nebraska and Oklahoma. Later he moved to Trenton, Mo., where, after rebuilding the gas and electric plants, he was appointed local manager for the holding company. He occupied this and other similar positions with the same company until moving to Kansas City in 1911. His first position there was with the electric light company, but later he was transferred to the railway company in charge of the metering equipment. He has since been connected with various departments and in different capacities, going into the general manager's office in May, 1924, as statistician.

Mr. Cloyd, was born in Hastings, Neb., on Aug. 26, 1883, and lived there until after finishing his education, which included a two-year university course in electrical engineering. He spent his vacations and other spare time while attending school working in a small foundry and machine shop, which, in addition to a general repair shop, manufactured a line of small electric motors.

J. D. Cornell
Freight Traffic Manager

J. D. Cornell began his railroad work in 1890 in the car accountant's office of the Chicago, Burlington & Quincy Railroad at St. Joseph, Mo. From 1892 until 1900 he was employed in the accounting department of the St. Joseph & Grand Island Railway at St. Joseph. He went to Kansas City in 1900 and for seven years served in the general freight department of the Kansas City Southern. In 1907 he was selected to take charge of the compilation of tariffs for the Southwestern Tariff Committee at St. Louis, and he served in this capacity until 1910, when he became traffic manager of the Rock Island Southern Railway (Electric) at Davenport, Iowa.

During 1905 and for several years following Mr. Cornell served as traffic manager of the Joplin & Pittsburgh Railway and the Southwest Missouri Railway, electric interurban roads operated in the metal mining district of Missouri. He has held the position of freight traffic manager at Kansas City for the last seven years.

C. A. Kincade
Superintendent of Distribution

C. A. Kincade entered the service of the Metropolitan Street Railway, Kansas City, on May 22, 1900. His first work with this company was as a gripman on the old Twelfth Street cable line. In September, 1903, he was promoted to the position of assistant superintendent of the Twelfth Street division and as such his duties included the handling of trainmen and carhouse men as well as the work now taken care of by the timekeeper and cashier. Mr. Kincade was transferred to the electrical department in September, 1904. In 1905 he was appointed assistant to the electrical engineer. At that time his work included timekeeping and power despatching as well as clerical and general office work. Still in the capacity of assistant electrical engineer, in 1907 Mr. Kincade was placed in charge of all overhead and underground construction and maintenance work. At that time the power houses and substations were handled by his department.

In March, 1918, he was appointed superintendent of the electrical distribution department and he has handled those duties since then. On May 22 next Mr. Kincade will celebrate his twenty-eighth anniversary as an employee of this property.

Mr. Kincade was born and reared in Mason County, West Virginia. He removed to Kansas City in 1900.

Howard W. Smith
Superintendent of Way and Structures

Howard W. Smith was employed in various capacities with road surveying parties in both the states of Michigan and Missouri from 1902 to 1906. In the latter year and until 1909 he was resident engineer in the construction of the Pacific Coast extension of the Chicago, Milwaukee & St. Paul in Dakota and Montana.

Mr. Smith was first employed by the street railways in Kansas City in 1911 as assistant engineer of the way and structures department and he has been in that department continuously since that date with the exception of four months in 1918 in war service. In 1916 he was appointed assistant superintendent of way and structures and served in that capacity until last October, when he was appointed superintendent of the department, reporting to R. W. Bailey.

Mr. Smith was born in Grand Rapids, Mich., in 1883 and lived there until 1903, when he moved to Kansas City.

R. S. Neal
Superintendent of Equipment

R. S. Neal, superintendent of equipment, went to the Kansas City Railways on March 16, 1918, from the Kansas City Power & Light Company and was first employed in the way and structures department. Following several assignments in the engineering field, he returned to the Kansas City Railways on Nov. 12, 1920, to take charge of the engineering work for the mechanical department. He organized the engineering department, which includes all the designing work, making up of specifications, shop work plan and general drafting work. This position he held until April 1, 1922, when he was appointed assistant superintendent in charge of the mechanical department, reporting to R. W. Bailey.

J. A. Harder

L. M. Boschert

D. E. Druen

Harry M. Smith
Assistant Superintendent of Transportation

Harry M. Smith entered the electric railway field as a despatcher with the Lorain & Cleveland Railway, Toledo, Ohio. This was not a big property and Mr. Smith, after several years of experience, was appointed auditor of the road, holding that position until it was merged with the Lake Shore Electric Railway, which operated between Cleveland and Toledo. Following the merger Mr. Smith was appointed chief train despatcher and later division superintendent. After six years with this property Mr. Smith was employed by J. M. Bramlette of the Michigan United Railways as interurban superintendent. This property operated in the city of Battle Creek, and from Jackson to Kalamazoo, a distance of about 70 miles. He held this position for seven years, when he resigned to accept an offer as superintendent of the Mexico Tramway in Mexico City, Mexico. He remained with this road for five years and then returned to the states and went direct to Chicago, serving for a year and a half as director of service for the Willys-Overland Company.

One day in Chicago Mr. Smith met his old friend J. M. Bramlette, who was then with the Lincoln Traction Company of Lincoln, Neb., and Mr. Bramlette prevailed upon him to return to the electric railway field as his superintendent of transportation. After three years at Lincoln, Mr. Smith went to Kansas City and in November, 1919, joined the organization as assistant superintendent of transportation, the same position he now holds.

Mr. Smith was born in Swanton, Ohio. He received his high school education in Toledo.

I. R. Carson
Assistant Superintendent of Transportation

I. R. Carson went direct from a farm in Ellsworth County, Kansas, to Kansas City and a year or so later he entered the service of the Metropolitan Street Railway on May 30, 1906, as a motorman serving in that capacity until 1911, when he was made day office clerk. The next year he became the assistant division superintendent at Ninth and Washington and in 1913 was transfrred back to 48th and Harrison as assistant division superintendent under D. L. Fennell, who is now at the head of the entire transportation department.

In 1914 Mr. Carson was appointed superintendent of the Kansas City & Westport Belt Railway, a subsidiary of the old Metropolitan Street Railway. In 1915 he was transferred back to Ninth and Washington as division superintendent, where he remained until July 1, 1918, at which time he was placed in charge of work trains and freight service. Exactly a year later, on July 1, 1919, he was appointed assistant superintendent of transportation. He has held that position continuously since then. Mr. Carson was born in Brooklyn, N. Y.

E. W. Holmes Promoted at Buffalo

Edward W. Holmes has been appointed assistant treasurer and assistant secretary of the International Railway and International Bus Corporation, the railway subsidiary, Buffalo, N. Y. Mr. Holmes brings to the post a wealth of transportation experience, having been engaged in the business for practically his entire career. In 1906 he became connected with the company as a clerk in the auditing department. Through successive promotions he became secretary to the president, at that time Thomas Penney. When Mr. Penney resigned in 1912, Mr. Holmes continued as secretary, as well as office manager of the legal department. From 1921 to 1924 he occupied the position of secretary to the International Railway voting trust, and continued there until his apointment to his new position.

E. G. Grimes is serving as division superintendent of the Union Traction Company at Marion, Ind. He joined the forces of this company in 1907, working on the Broad Ripple line for three years. He was then promoted to interurban conductor. When in the fall of 1917 C. S. Keever was appointed superintendent of transportation he appointed Mr. Grimes division superintendent at Fort Harrison. After this position was abolished Mr. Grimes was made instructor on all divisions and afterward was made freight claim investigator.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Action on Fifteen Cars for San Francisco Expected

The public utilities committee of the Council of San Francisco, Cal., on April 15 postponed until its next meeting action on a recommendation by the Board of Public Works that $290,000 be set aside for the purchase of fifteen new cars for the projected Judah Street line of the Municipal Railway.

Completion of the line, in connection with the new Duboce tunnel, is partially contingent upon approval of proposed municipal line extensions at the coming bond issue election. It was said at the meeting, however, that the line might be completed out of the railway funds if the issue should not be approved by the voters. Investigation of this possibility was ordered before the next meeting.

It was explained that the cars should be ordered eight months in advance of the expected date of their need in order to insure delivery on time. Action on the matter is not expected to be longer delayed.

Economic Trend to Be Discussed at Chamber of Commerce Meeting

President Coolidge and Secretary of Commerce Hoover will be among the speakers who will address the fifteenth annual meeting of the Chamber of Commerce of the United States to be held in Washington May 2 to 5. This national gathering of business leaders from all parts of the United States has been called to discuss the important economic changes that have taken place in the business life of the nation during the past few years. The discussions will center around the major topic "The New Business Era."

President Coolidge's talk will be delivered before a joint meeting of the national Chamber of Commerce and the Pan-American Commercial Conference. The latter conference will be attended by representatives from the Latin-American countries and will be held in Washington during the week of the meeting of the national chamber.

In many respects the meeting will be one of the most important ever held by the chamber. A statement says:

> American business, sweeping forward under the play of new economic forces, finds it more necessary than ever to look into the future. What do changes that are taking place foretoken? How sharp is the break from the conditions before the war? In what direction are we headed? Are we approaching ever more important readjustments than we have seen in the recent past?
>
> The new business era demands the careful weighing of many problems. It calls for study of complicated relationships. Trades and industries are entering new fields. Business units and conditions are changing. New points of contact with government and within commerce and industry are being developed.
>
> Business is achieving so many new things even the best observers cannot keep abreast of them all. Industries are changing with new inventions and the application of new methods. Selling goods at home and abroad is bringing out new features of distribution.
>
> The annual meeting of the national chamber will survey economic trends with the purpose of determining their meaning, with the hope of throwing light into the future. Leading business men will bring forward new problems within their industries. Newly arising questions that are bothering large sections of the country will be discussed.

Simplified Invoice Drafted by U. S. Commerce Committee

Accompanied by an acceptance blank, the simplified invoice recently adopted by the joint committee of invoice simplification is being distributed by the Department of Commerce. The new invoice was unanimously chosen by the committee at a meeting held Feb. 16 and is the result of a series of meetings held during the past few months. The committee has given considerable study to the problems of the vendor and the customer, and it is of the opinion that all contingencies and the best features of both the uniform and the national standard have been taken care of in the form now circulated in the mails. In addition to the invoice set up as shown elsewhere on this page, the committee has circulated the following instructions:

To conform to standards:

> "Customers' Use" block must be exactly as shown.
>
> Designations must all be shown.
>
> Sequence and position of designations must be as shown.
>
> Sizes—8½ in. from side to side; 7, 11, and 14 in. from top to bottom.

Optional for user's convenience:

> Size and arrangement of space for vendor's name, address, trademark, etc., may be changed as desired.
>
> Spacing both horizontal and vertical to left of both Customers' Use block may be changed if desired.
>
> "Ship To and Destination" may be arranged for window envelopes.
>
> "Quantity," "Description," "Price," and "Amount" columns may be subdivided as desired.
>
> Invoices for retailers should provide a column ⅞ in. wide to the right of the "Amount" columns and headed "For Retailer's Use."

Another note reads: "In case of multiple billing, provide columns here for order number. If not so used, this space may be added to the width of the other columns." The space indicated is at the left of that portion of the form used for detailing items. The committee also requests that the users of either standard or uniform forms adopt the simplified invoice form when the supply of their present forms is exhausted.

D. H. Moore Promoted by Ohio Brass

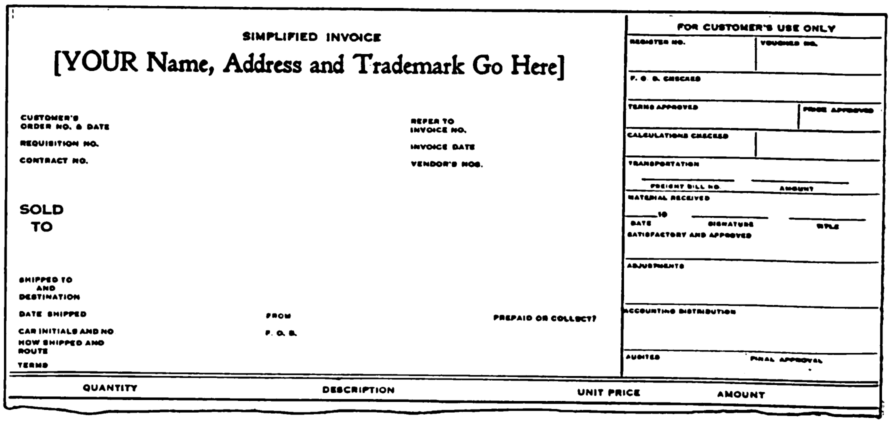
David H. Moore, since 1925 electrical engineer and assistant to the secretary of the Ohio Brass Company, Mansfield, Ohio, has been appointed district sales manager of the company with headquarters at 50 Church Street, New York City. Mr. Moore's appointment took effect March 21. He will handle steam railroad accounts in parts of New York, New Jersey, Pennsylvania and the New England states.

Before going to the Ohio Brass Company Mr. Moore spent seven years with Day & Zimmermann, Inc., Philadelphia, in consulting and general engineering work. For eight years prior to that he was connected with the Schenectady and Pittsfield Works of the General Electric Company.

Seattle's Mayor Wants Car Bonds Sold Locally

Mayor Bertha K. Landes of Seattle, Wash., has suggested that since the city has been unable to reach any agreement with the St. Louis Car Company in regard to its taking city bonds in payment for 80 new cars contracted for by the Municipal Railway the bonds be sold locally. She says this plan would speed up the purchase and enable the city to buy the cars at a lower figure.

The Mayor said that after conferring with representatives of the car company and St. Louis bankers she was convinced that a deadlock had been reached. The company is unwilling to take the bonds without a priority agreement in view of the litigation pending against the railway in the federal courts. The issue totals $1,420,000.



SIMPLIFIED INVOICE

[YOUR Name, Address and Trademark Go Here]

CUSTOMER'S ORDER NO. & DATE
REQUISITION NO.
CONTRACT NO.

REFER TO INVOICE NO.
INVOICE DATE
VENDOR'S NOS.

SOLD TO

SHIPPED TO AND DESTINATION
DATE SHIPPED
CAR INITIALS AND NO
HOW SHIPPED AND ROUTE
TERMS

FROM
F. O. B.
PREPAID OR COLLECT?

FOR CUSTOMER'S USE ONLY
REGISTER NO.
VOUCHER NO.
F. O. B. CHECKED
TERMS APPROVED
PRICE APPROVED
CALCULATIONS CHECKED
TRANSPORTATION
FREIGHT BILL NO.
AMOUNT
MATERIAL RECEIVED
19
DATE
SIGNATURE
TITLE
SATISFACTORY AND APPROVED
ADJUSTMENTS
ACCOUNTING DISTRIBUTION
AUDITED
FINAL APPROVAL

QUANTITY
DESCRIPTION
UNIT PRICE
AMOUNT

New simplified invoice unanimously adopted by joint committee on invoice simplification

Manhattan & Queens Railway Relocating Tracks

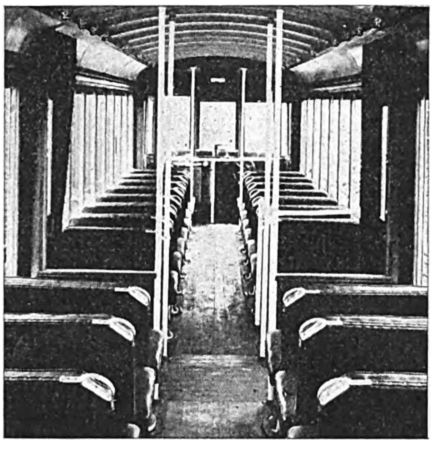
Work of relocating the track of the Manhattan & Queens Traction Corporation on Queens Boulevard, Borough of Queens, N. Y., has begun. The Eastern Construction Company, New York, is doing the work. It calls for relocating the tracks from Van Dam Street, Long Island City, through the communities of Winfield and Woodside to Fifty-sixth Avenue, Elmhurst, L. I.

At present, following the path of the old Queens Boulevard, the tracks of the railway alternate between the southbound and northbound side of the vehicular roadway. When the present work is completed and the old tracks removed those sections will be repaved and then two wide highways with one-way traffic on each will be available for motorists.

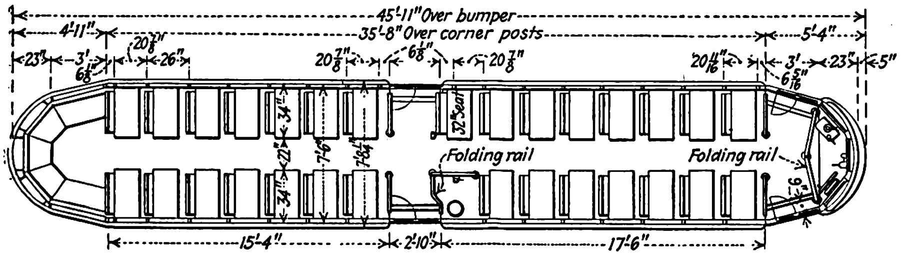
Porto Rico Railway Gets Six New Two-Man Cars

Following are specifications of the six new two-man, single-end cars delivered on March 3 to the Porto Rico Railway, Light & Power Company, San Juan, Porto Rico, by the Perley A. Thomas Car Works of High Point, N. C.:

Date order was placed	Oct. 14, 1926
Date of delivery	March 3, 1927
Type of car	Single-end, front-entrance, center exit, two-man
Weight:	
Car body	14,500 lb.
Trucks	8,278 lb.
Equipment	6,222 lb.
Total	29,000 lb.
Bolster centers, length	26 ft. 0 in.
Length over all	45 ft. 11 in.
Truck wheelbase	5 ft. 2 in.
Width over all	7 ft. 8½ in.
Height, rail to trolley base	10 ft. 7⅝ in.
Body	All steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	General Electric Co.
Axles	Taylor Electric Truck Co.
Bumpers	Channel
Car trimmings	Thomas
Center and side bearings	Taylor Electric Truck Co.
Conduits and junction boxes	Duraduct
Control	General Electric K-75-A
Couplers	Car builder
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote, double-faced
Destination signs	Hunter
Door operating mechanism	Car builder
Fare boxes	Johnson
Fenders	Consolidated
Finish	Duco
Gears and pinions	General Electric Co.
Hand brakes	National Brake Co.
Headlights	Electric Service Supplies Co.
Journal bearings	Taylor Elec. Truck Co.
Journal boxes	Taylor Elec. Truck Co.
Lightning arresters	General Electric Co.
Motors	G.E.264-A, inside hung
Sanders	Ohio Brass Co.
Seats	Heywood-Wakefield Co.
Seating material	Leather
Springs	Taylor Electric Truck Co.
Step treads	Kass
Trolley catchers	Ohio Brass Co.
Trolley base	General Electric Co.
Trucks	Taylor Electric Truck Co.
Wheels	Cast iron, 24 in.



Interior view near center door of new 65-passenger cars for the Porto Rico Railway, Light & Power Company



Commodious seating plan for cars

Track Improvement Begun by East Chicago, Ind., Railway

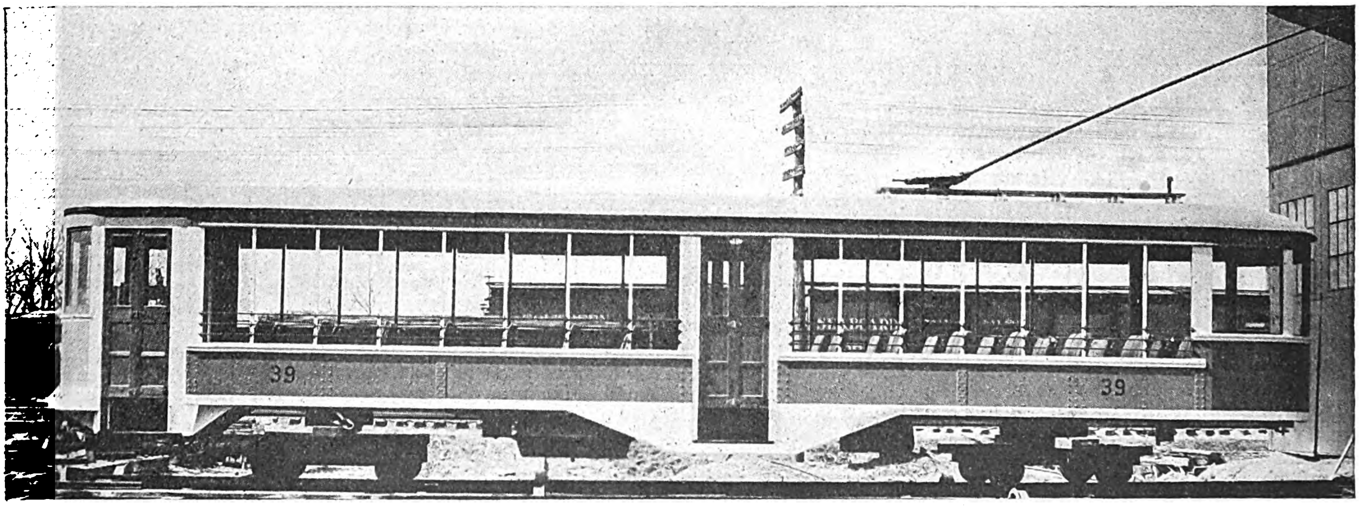
Improvement of its right-of-way on Forsyth Avenue in East Chicago, Ind., from 150th Street to the northern city limits, a distance of about 3½ miles, is being made by the Hammond, Whiting & East Chicago Railway. The project includes realignment and paving of tracks over the entire route, according to Charles E. Lawrence, general manager.

At the request of property owners along Main Street, East Chicago, and the Board of Public Works, officials of the railway and of the Gary Railways are also considering plans to pave their right-of-way along that street. Due to the narrowness of the thoroughfare and the parking of automobiles along the curb, motorists are compelled to use the tracks. Property owners have asked the companies to pave the right-of-way in order to furnish a well-paved thoroughfare from curb to curb.

Heavy Buying in the Copper Market

A large volume of copper buying after seven weeks of unusual dullness was the outstanding feature of the non-ferrous metals market for the week ended April 20. On this date the price seems to be fairly well established at 13⅛ cents delivered in Connecticut. Business in the other metals was only moderate and prices for lead and zinc are lower than a week ago. Antimony is quiet but firm, tin is quiet and steady and quicksilver is dull and easier. A further reduction in the price of platinum was made during the week, the market for all of the platinum group of metals being stagnant.

The issuance of March copper statistics showing a decided improved position in respect to stocks and current production started a buying wave April 13 that continued for five business days, reports *Engineering and Mining Journal.* The total volume of sales has been greater than the aggregate of the four preceding weekly periods and was exceeded by only one week since the first of the year. Deliveries have been specified principally for May and June, with a lesser quantity for prompt and



Typical exterior of steel car bodies built by the Perley A. Thomas Car Company for service in San Juan, P. R.

some as far ahead as July. In spite of the activity, it seems improbable, however, that the "Slack" created in the last seven weeks has been taken up, and sellers look for further buying in reasonable volume. Most of the Eastern business was placed at 13 cents until Monday, when all but two or three sellers increased their price to 13⅛ cents. A little 13-cent metal hung over until April 19, but on the day following 13⅛ cents appeared to be the bottom and some were talking of even higher prices. Foreign business has likewise been good and effective; April 20 the price of the export association increased to 13.50 cents c.i.f., the former figure being 13.35 cents. The f.a.s. market is quiet at about 13.20 cents. Domestic buying April 20 was quiet, but a breathing spell is to be expected. One large consumer took the attitude that he could afford to wait now until he sees whether the curtailment in output shown by the March figures will persist in April.

With no apparent curtailment in mine output in Joplin, a reduction in the ore price to $42 a ton, prime Western zinc, had eased during the week in a quiet market. Galvanizers are still backward buyers and on April 20 metal was available at from 6.30 cents to 6.325 cents. High grade is quoted at 8.25 cents delivered in New York and continues dull.

LEAD DOWN TO 7 CENTS, NEW YORK

Lead is indubitably weaker and no one seems to be optimistic as to the price trend in the immediate future. Sales in the last week have been of fair volume but current consumption is disappointing compared with last year and is almost certainly below the rate of production. Production, incidentally, shows no signs of declining in the March statistics, and without such curtailment there can be little hope of better prices. Mexican production, which it was supposed had been cut, actually showed a substantial gain.

On Monday, April 18, the American Smelting & Refining Co. reduced its contract price for New York lead from 7.25 cents to 7.15 cents. Reductions were also made by sellers in the Middle West from 6.90 cents, St. Louis basis, to 6.80 cents. Even at the reduced levels few buyers could be found, battery makers continuing out of the market. A little interest was shown by paint manufacturers, who report a good though seasonal improvement in their business; two or three days ago, for example, a fair sized order for corroding lead was placed at 7.05 cents, Chicago basis. Late this afternoon, a further reduction was made by the Smelting Co. to 7 cents, New York, practically no business having been done at the higher level.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	April 19, 1927
Copper, electrolytic, cents per lb	12.87
Copper wire, cents per lb	15.25
Lead, cents per lb	7.15
Zinc, cents per lb	6.71
Tin, Straits, cents per lb	68 625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	2.25
Franklin, Ill., screenings, Chicago, net tons	2.50
Central, Ill., screenings, Chicago, net tons	2.00
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.66

TIN DROPS AFTER QUIET WEEK

The Easter holidays in London have interfered with the tin market, with the result that until April 20 prices showed little change, though sellers were firm. The marked drop in London on that date was unexpected in view of the rather strong tone here; it brought New York prices for prompt Straits to the neighborhood of 68 cents, with forward tin about 1½ cents less.

Steel Castings 62 Per Cent of Shop Capacity

March bookings of steel castings, as reported to the Department of Commerce by the principal manufacturers, were 62 per cent of shop capacity, as against 69 per cent in February and 81 per cent a year ago. The production of steel castings was 73 per cent of capacity in March, as against 64 per cent in February and 83 per cent a year ago. The 123 reporting concerns have a present monthly capacity of 133,000 tons and represent over four-fifths of the commercial castings capacity of the United States, of which 60,100 tons are usually devoted to railroad specialties and 72,900 tons to miscellaneous castings.

Rolling Stock

Johnson City Traction Company, Johnson City, Tenn., is reported to have bought two new cars.

Charleston Consolidated Railway & Lighting Company, now a subsidiary of of the South Carolina Power Company, Charleston, S. C., will add nine new Birney safety cars to its equipment, according to a newspaper statement by Stuart M. Cooper, vice-president and general manager. Some of the cars have already been shipped and will probably be delivered shortly, it was stated.

Evanston Railway, Evanston, Ill., according to press reports, will add six new street cars to the thirteen now in service in the city. The new cars, estimated to cost $12,000 each, will probably be put into service in the next two months.

Track and Line

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has started special track reconstruction work on East Wisconsin Avenue. Temporary rails have been laid along the curb so that service will not be interrupted.

Municipal Railway, Seattle, Wash., will make two track extensions in the city if a recent recommendation of the city utilities committee is adopted. One extension is designed to reduce traffic congestion on University Way and the other to provide additional means of travel between Montlake and the University business district. The new work will cost $17,000 and will be paid for by sale of railway warrants.

South Carolina Power Company, Charleston, S. C., is reported as spending $100,000 for new rails on several of its lines. Work is now being done on Meeting Street. Later operations will extend to King Street in Charleston.

Kansas City Public Service Company, Kansas City, Mo., is reported to have begun work on laying temporary tracks from Nineteenth to 24th Streets on Southwest Boulevard, Kansas City. The new tracks and paving of the right-of-way are in advance of the paving of the boulevard. Bids on paving the boulevard received some time ago by Matthew S. Murray, director of public works, call for one of four constructions, a 3½-in. brick top, 3½-in. top of asphalting, 2-in. top of asphaltic concrete or Warrenite bitulithic on the present concrete base.

Shops and Buildings

Wisconsin Valley Electric Company, Wausau, Wis., recently broke ground for a new 96 x 185-ft. concrete and steel carhouse to be erected at First and De Kalb Streets, Wausau. The new structure, estimated to cost $42,000, will replace one twenty years old.

Knoxville Power & Light Company, Knoxville, Tenn., according to a recent press report, will shortly occupy two additions which have been built to its carhouse located at the intersection of Magnolia Avenue and Jessamine Street in Park City. Brick, steel and concrete are being used in the construction of the carhouse and brick and concrete will be used in the garage addition. The additions will cost $12,000.

Trade Notes

Rome Wire Company, Rome, N. Y., has opened a new warehouse at 622 West Adams Street, Chicago, Ill. F. R. Weaver, district manager, is in charge.

Billings & Spencer Company, Hartford, Conn., has transferred J. H. Coyle, formerly supervisor of engineering, to be directly in charge of sales engineering in New York, Pennsylvania and New England. His headquarters will be at Hartford.

American Hammered Piston Ring Company, Baltimore, Md., has added H. W. Marshall to its sales force. Mr. Marshall's territory will include Kansas, Oklahoma, Arkansas and part of Missouri.

United States Rubber Company, New York, is responsible for a new publication, the *U. S. Tire Retailer*, of which Vol. 1, No. 1 appeared on March 1, 1927. E. F. Underhill is editor and Donald Fairbanks associate editor. The magazine is primarily designed to serve the tire dealers in the United States. Its size is 8½x12 in. Excellent illustrations and heavy glazed stock add to the attractiveness of the interesting text matter.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, April 30, 1927 *Number* 18

The Four Horsemen Ride Again

THEY are riding again!—those apocalyptic horsemen of destruction. This time their diabolical forms are reflected in the swishing, sucking torrent of the Mississippi. They cackle with glee each time a levee breaks! They rock crazily in their saddles as home after home topples and then goes careening down the flood.

From Missouri to the Gulf these enemies of mankind are being fought with heroic effort and undaunted courage. While most of us sit in safety on the highlands, history grim and glorious is being made. Among its makers are hundreds of public utility men and women. That they have gone and will go beyond the call of duty is assured. That their heroic deeds will be set down is not so certain unless those who could only stand and wait will write what the actors were too modest to record. A flood of the present magnitude is bound to develop engineering and operating problems never before experienced. Each situation will add to the storehouse of knowledge. Each problem conquered will doubly arm the nation against the time the Four Horsemen ride again!

A Little Book with a Big Message

VERY often much more attention than it really deserves is attached in business to the value of appearances as reflected in the clothes a man wears. It is appalling to think of how much business has been lost through officials, secretaries and office boys turning down the poorly dressed visitor, or what intellect and acumen have been steered toward poorhouses, jails and cemeteries by reason of the same false evaluation. For this reason one is elated to note that in a recently published brochure, "Our Part in Public Service," the Nashville Railway & Light Company is telling its employees that "clothes don't make the man."

Furthermore, it is backing up the action with a true story which is prefaced with these remarks: "Deal just as promptly, as willingly and just as courteously with the person of poor appearance as you would with one dressed in finery. Appearance means nothing in our business. The humblest citizen is entitled to and must receive the same courteous attention as the person with social standing or prosperous appearance."

But such a sound principle as this is only a tithe of what this vest pocket compendium of good manners contains. Among other paragraphs that make it stand out from the ordinary run of courtesy creeds is the one devoted to the subject of how to say "hello" without keeping the "hell" in it. In this particular, much has been written about telephone courtesy, but the JOURNAL does not recall any text so far that has so skillfully or convincingly pointed out what a vital part voice inflection plays in this phase of public relations.

Those responsible for the little book do not hesitate to attack quite seriously one of the great curses of big business, i.e., departmental jealousy. On this subject, and one captioned "The Public Is Fair When Fully Informed," there are rare expressions of good, hard common sense. Thirteen hundred of the booklets have been distributed among employees of the company, and it is no exaggeration to state that this distribution could be multiplied by a hundred to the ultimate benefit of all those who in our field are striving to bring about a deeper and keener understanding of the public relations problem. Had "Our Part in Public Service" been published in the era of the Latins they would undoubtedly have pronounced it *multum in parvo.*

Wanted— A Maintenance Exhibit

EVEN though the Cleveland convention is still more than five months away, it is none too early to get exhibit plans under way. All signs indicate that this will be the greatest convention ever held by the industry. It is significant that several operating companies have already notified Director of Exhibits F. C. J. Dell that they are planning to show new cars and equipment developed on their properties. Likewise, progressive and wide-awake manufacturers are making preparations to show the most recent improvements in their apparatus so as to be identified with the march of progress in the industry.

That this year's car exhibit will exceed in size the record-breaking showing of last year seems more than probable, as the result of the energy and enthusiasm which J. H. Alexander, chairman of the exhibit committee, is putting behind this phase of the convention. That it will far exceed last year's exhibit in the showing of radical developments in car body and truck design is already assured by the several construction experiments which are under way.

There is, however, one important phase of an electric railway exhibit which has in the past been obviously deficient in comparison with its importance as a major item in successful operation. That is the showing of tools and equipment which decrease maintenance costs and improve workmanship. Electric railway shops are notoriously lacking in modern tools and machines. This is in part, at least, attributable to neglect of the field by the manufacturers of such equipment. True, electric railways have been poor buyers of tools and machines. They have in the past worried along with old machines as best they could and have overlooked the savings which modern shop equipment make possible. Part of this situation is attributable to their depleted finances, but another important factor has been neglect of the market by the tool manufacturers. There is a feeling among them that one large automobile manufacturer is a better prospect for machinery sales than is the electric railway field. In a measure, there was in the past some basis for this viewpoint, because the progressive motor manufacturer does not hesitate to throw out old machines to make even a small reduction in his manufacturing costs.

Today, however, the electric railway situation is changing rapidly. There is a growing interest in all phases of modernization. There is under way an active campaign for better methods, increased efficiency and improved performance. In addition, the bus has become an important part of the transportation industry, and with its introduction efficient maintenance machinery takes on increased importance. Wide-awake maintenance equipment manufacturers may well afford to interest themselves in the opportunity for showing their products under the favorable conditions that will exist at Cleveland.

Figures for 1926 Very Encouraging

SIGNIFICANT, indeed, is the interpretation of the facts contained in the association's statistical study of the earnings of the electric railways for 1926, abstracted elsewhere in this issue. It is apparent, for instance, that companies other than the large ones are beginning to share in the improved conditions of the industry. The affairs of the very small companies, however, are still bad, but it should be borne in mind that these companies constitute only a fraction of the total. In fact, their influence on any statement reflecting the operations of the whole industry is practically negligible.

While the electric railways are increasing their bus services they are not curtailing their rail lines, but are giving more rail service measured in car-miles than they ever did. And they are doing this even though on the whole fares are not what they should be. The average fare per passenger in 1926 was 7.10 cents. In order to produce the same net today as in 1912 the average fare should have increased 56 per cent instead of 35 per cent; in other words, the average fare should be 8.22 cents instead of 7.10 cents. Since the railways have shown their confidence in the public's integrity by expending the money necessary to provide additional service, the obligation of the public, as the JOURNAL has repeatedly pointed out, is of course to pay for that service so that the railways may receive a fair return on the money they are investing.

The author of the article commenting on the figures makes no bones of the fact that many electric railway managements have neglected to take advantage of improved methods and equipment which might have helped them to better their conditions. It is his idea that they have been especially derelict in the field of public relations. On the other hand, the more progressive managements among both the larger and the smaller properties, with operating conditions identical with those of the rest of the industry, have by their skill and their readiness to adopt new ideas succeeded in holding or increasing their traffic and enlisting the co-operation of their patrons, so that as a result they have been able to secure more equitable consideration from the public authorities. This is very encouraging. Despite all the seeming cross-currents the conclusion is inescapable that the companies comprising the great bulk of the industry, while by no means prosperous, are nevertheless confidently going forward with plans for the future and that there is every reason to take heart.

Another Year of Legislative Debate at Boston

FINALLY all the thunder on Beacon Hill with its promise of legislation for the Boston Elevated Railway has proved to be nothing but a dud. The Legislature has come to the end of its session, has wasted a great deal of time with matters affecting the Boston Elevated, rejected one proposition after another, and at last discarded everything. Nothing suited the lawmakers. Never in the history of Boston railway legislation has a case been more thoroughly prepared than was the Elevated situation this year, with most comprehensive plans from commissions and individuals of recognized merit.

Gov. Alvan T. Fuller was insistent upon some action, but the only thing that has come out of it all is a request to the Department of Public Utilities to value the road. Even that was a hurried afterthought. There were all the extremes, from a 50-year extension of public control of the Elevated to an immediate return of the property to the stockholders, and between these extremes came numerous compromises, resulting in bitter clashes among factions in the Senate and the House. It was earnestly argued that even if no legislation could be agreed upon regarding the control and financing of the company there must be no failure to provide for the physical extension of the rapid transit system. Even this has gone by default.

Montreal Takes a Step Ahead in Power Conversion Equipment

DURING the past decade, in the power supply for electric railway service, changes have taken place from the manual substation to the automatic synchronous converter station, which has become almost standard for a large number of railways. Much more recent is the development of the mercury-arc rectifier for this class of service. The installation of rectifiers made by the Montreal Tramways represents what is probably the first fully automatic substation in America using rectifiers. Certainly it is the first automatic rectifier station in Canada.

While it is not to be assumed that the rectifier is a fully perfected piece of apparatus, it has gone a long way from the small glass bulb device. Save the principle, the latter has little in common with the steel inclosed rectifiers that have been developed for conversion of hundreds of kilowatts. Perfection of rectifiers such as these used in Montreal may be regarded as another triumph of engineering.

It is yet too early to know the results from the use of the Montreal rectifiers over long periods of time in heavy service. Similar equipment has been used in Europe for several years with satisfactory results, and the operating problems are well on the way to solution. It is to be hoped that the experience in Montreal will go far toward determining the applicability of the device in electric railway power circuits. The simplicity from an operating standpoint and the ease of providing full automatic control make it ideal for railway service.

Two Small Railways Come Into Their Own

BEFORE the calamity howlers of the daily press again draw the diapason of disaster and begin the final fugue of the funeral march over the electric railways in small communities they should ponder well the cases of the companies in Williamsport, Pa., and Fitchburg, Mass., reported in the JOURNAL for April 23. True, peace and plenty are not likely to flow forth in these places for the railways as they did from Ceres' cornucopia, but these two instances do show what railway men of leonine heart, aided and abetted by their communities, have done to restore to these roads the prestige they deserve. In the past things were not what they might have been in these towns from the standpoint of transportation, but all this has changed, changed because, unlike Trilby, the local people were not tone-deaf.

It is a different scene now to which "Williamsport Welcomes You" and upon which Fitchburg felicitates itself, different because responsible local people were unwilling that their railways, like those in some other communities, should be permitted to slip into the slough of innocuous desuetude. All the electric railway in the small community asks is a square deal. It is entitled to that and nothing less. It doesn't want pity and it doesn't need it. Far too many railways in cities the size of Williamsport and Fitchburg have, however, been permitted to go from bad to worse, not because of any unwillingness of the responsible railway managers to do their part, but because local people of power and influence have been as destitute of backbone as a banana.

Track Developments Keep Pace With Rolling Stock Improvement

NOT to be outdone by the equipment engineers who recently have made notable innovations in rolling stock design, way engineers are busily occupied trying out new methods of track construction. An outstanding instance of this kind is the development of a base plate joint by the Eastern Massachusetts Street Railway. Details of its construction and a summary of the results obtained are given in this issue by Frank B. Walker, chief engineer.

Use of a welded base plate in addition to a pair of fish plates is not new. In these experiments, however, the fish plates have been omitted and only the base plate is used. Theoretically this scheme places the metal where it will do the most good. With a suspended joint the rail heads in contact carry any compression stresses and the welded base plate takes the tension.

Bending tests made at the Massachusetts Institute of Technology indicate that this type of joint is at least as strong as the ordinary welded fish plate joints, which have given satisfactory service for a number of years on this railway. Its strength appears greater than that of the rail itself, as numerous failures in the tests occurred by fracture of the rail rather than yielding of the joint.

It is too soon to draw conclusions as to the ultimate effect of these experiments on design of the track structure. If the base plate joint proves to be an acceptable substitute for other types now in use, it will mean a substantial saving for the railways. Developments of this kind are perhaps less spectacular than the recent ones made in car design, but they too play an important part in keeping the electric railway industry abreast of the times.

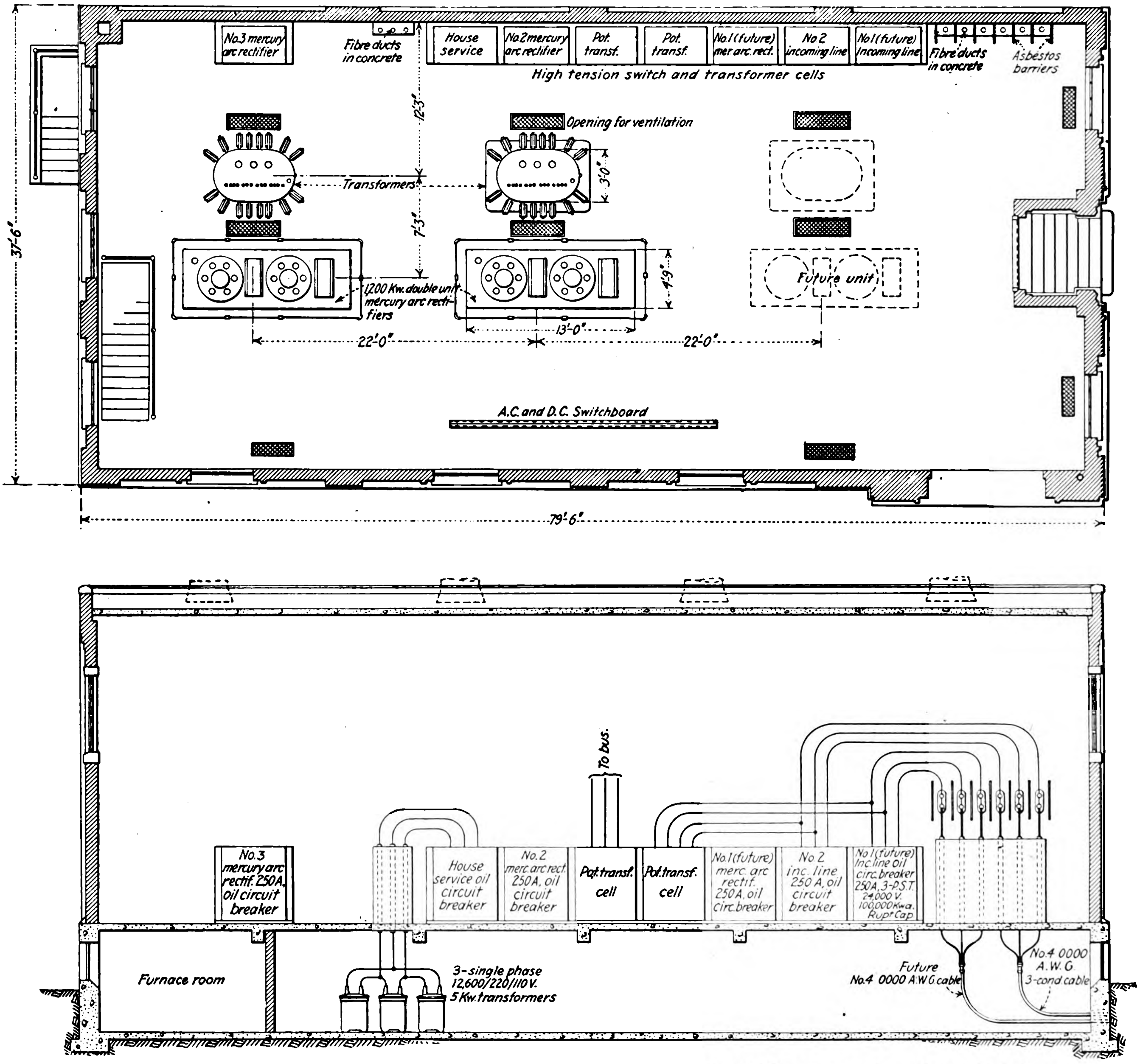
Detroit Takes a Step Backward

GLEE is a great thing—when it isn't misdirected. In gloating over the defeat of the paving relief measure in favor of the municipal railway in Detroit, the *Free Press* appears to have started off with the wrong foot. It is not the first time this paper has done that very thing. There is no need for ELECTRIC RAILWAY JOURNAL to reiterate that it holds no brief for municipal ownership, but while the *Free Press* does the same thing it leans over backward in its effort to stand up straight. The same paper says that in turning down the paving relief measure the electors rose above specious arguments and showed that they understood the significance of the question at issue. They are said to have displayed "discrimination and discretion." According to the *Free Press* "the cost of paving between tracks is a natural and legitimate charge against the railway system, and by retaining it as such the voters insist that municipal transit facilities be operated and financed according to the methods and principles that would be adhered to if the lines were privately owned."

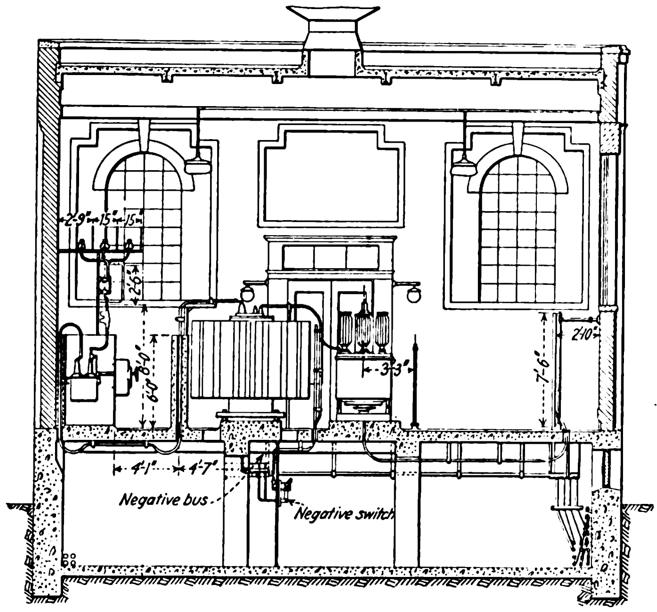
Indeed, and who told the *Free Press* that? It sounds like ancient of days. Doesn't that paper know that the thing the municipal railway sought is the very form of relief five states and more than 50 municipalities have already granted to private companies? If it did know it and did not say so, it was unfair, to say the least. If it did not say so because it did not know it, then that paper was ignorant.

The arguments in favor of paving relief are so well known to JOURNAL readers that there is no need to reiterate them. Paving burdens imposed upon the railways, if they ever were justified, are an anachronism in the present day and generation. The measure of relief extended to the railways proves that they are being increasingly so accepted. And if they are an anachronism as applied to private companies, surely they are no less an unwise exaction in the case of a municipal railway. They are a charge that the rider must meet, and to the very extent that such payments are exacted they are a factor in increasing fares.

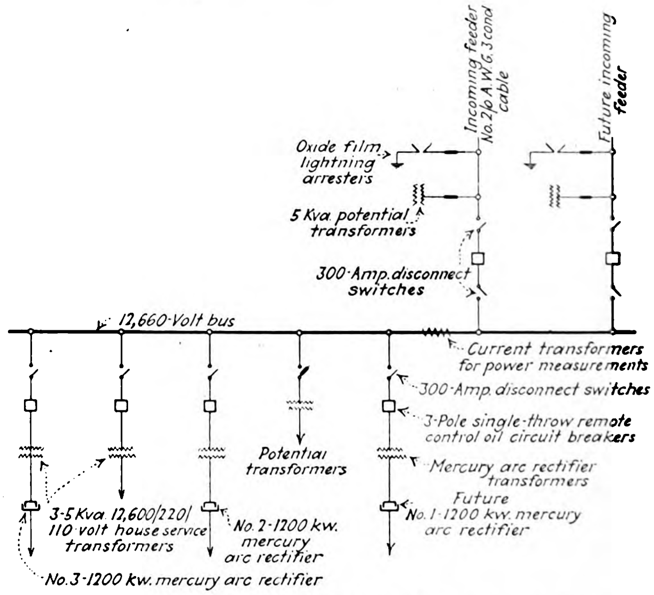
No, in defeating the relief measure at Detroit, the voters there did not show they really understood the significance of the question at issue. They showed discrimination but not discretion. Their discrimination was not only against the municipal railway but against themselves. As for the *Free Press,* it wrote itself down as either ill-informed or prejudiced. It is one thing to be against municipal ownership. But it is quite another not to be willing to concede to the municipal railway relief from onerous exactions properly but gradually being lifted from the backs of the privately operated companies. That is all there is to it. But that is quite enough.


No.3 mercury arc rectifier
Fibre ducts in concrete
House service
No.2 mercury arc rectifier
Pot. transf.
Pot. transf.
No.1 (future) mer. arc. rect.
No 2 incoming line
No 1 (future) Incoming line
Fibre ducts in concrete
Asbestos barriers
High tension switch and transformer cells
12'-3"
Opening for ventilation
Transformers
3'-0"
37'-6"
7'-3"
1200 Kw. double unit mercury arc rectifiers
4'-9"
Future unit
22'-0"
13'-0"
22'-0"
A.C. and D.C. Switchboard
79'-6"
To bus.
No.3 mercury arc rectif. 250A. oil circuit breaker
House service oil circuit breaker
No.2 merc. arc rect. 250A. oil circuit breaker
Pot. transf. cell
Pot. transf. cell
No.1 (future) merc. arc rectif. 250A. oil circ. breaker
No 2 inc. line 250 A. oil circuit breaker
No 1 (future) Inc. line oil circ. breaker 250A. 3-P.S.T. 24,000 V. 100,000 Kwa. Rupt. Cap.
Furnace room
3-single phase 12,600/220/110 V. 5 Kw. transformers
Future No.4 0000 A.W.G. cable
No.4 0000 A.W.G. 3-cond. cable

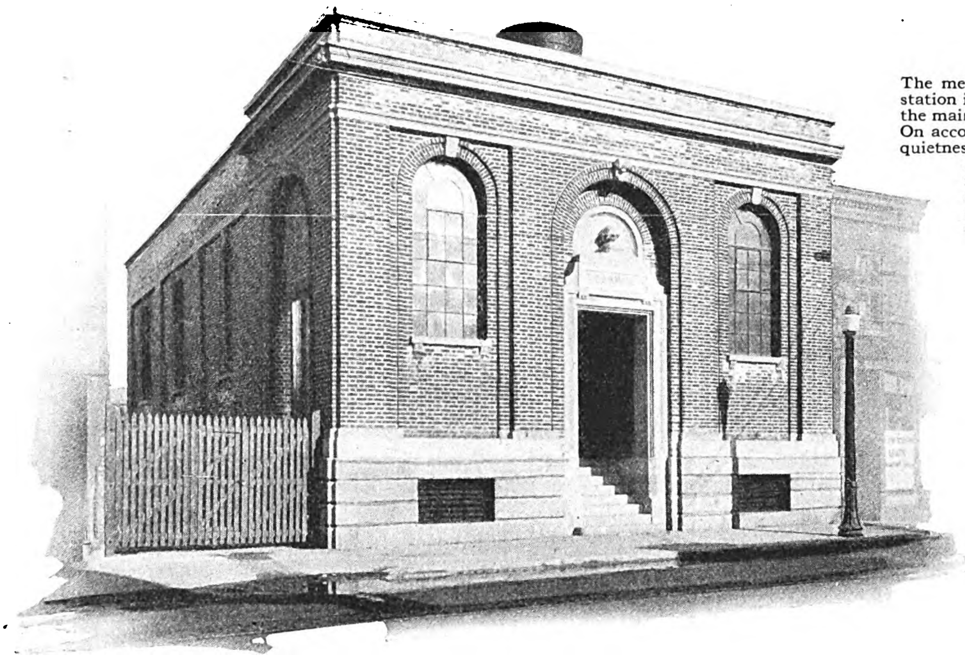
Ample room is provided in the Verdun substation of the Montreal Tramways for three 1,200-kw. mercury rectifier units. Two are now installed and in service


2'-9"
15"
15"
2'-6"
6'-0"
3'-0"
3'-3"
7'-6"
2'-10"
4'-1"
4'-7"
Negative bus
Negative switch

The arrangement of the Verdun substation is simple. Note absence of special foundations beneath the rectifiers


Incoming feeder No. 2/0 A.W.G. 3 cond. cable
Future incoming feeder
Oxide film lightning arresters
5 Kva. potential transformers
300 Amp. disconnect switches
12,660 Volt bus
Current transformers for power measurements
300 Amp. disconnect switches
3-Pole single-throw remote control oil circuit breakers
Mercury arc rectifier transformers
Future No. 1-1200 kw. mercury arc rectifier
Potential transformers
3-5 Kva. 12,600/220/110 volt house service transformers
No. 2-1200 kw. mercury arc rectifier
No. 3-1200 kw. mercury arc rectifier

Simplified connection diagram for the mercury rectifier substation



The mercury rectifier substation is located on one of the main streets of Verdun. On account of the absolute quietness of the equipment no objection was raised, and no precautions were necessary to inclose the doors and windows

First Canadian

Automatic Rectifier Substation

Installed by Montreal Tramways

Two 1,200-kw. mercury arc rectifier units supply power for operation of a section of the Montreal system at 600 volts d.c. Power from a 12,000-volt, three-phase circuit is converted without use of rotating equipment

CANADA'S first automatic mercury-arc rectifier substation has been placed in operation in the city of Verdun by the Montreal Tramways. During the past year the loads on this portion of the railway system have been increasing, and trouble was experienced on account of low voltage in Verdun and the wards of St. Ann, St. Gabriel and St. Paul in the city of Montreal.

Equipment of various kinds is used in the power system, so that any new substation would have to work in parallel with all of the existing apparatus. The major portion of the power for the operation of the Montreal Tramways is taken from the system of the Montreal Light, Heat & Power Company, being supplied in bulk at the Hochelaga power house, as shown on the map of the system. Here the power company has an outdoor station for changing from 66,000 volts to 12,600 volts for local distribution in Montreal and vicinity. The distribution for the tramway system is all at the lower potential, and except for a small distance is all carried in underground conduits owned by the tramway.

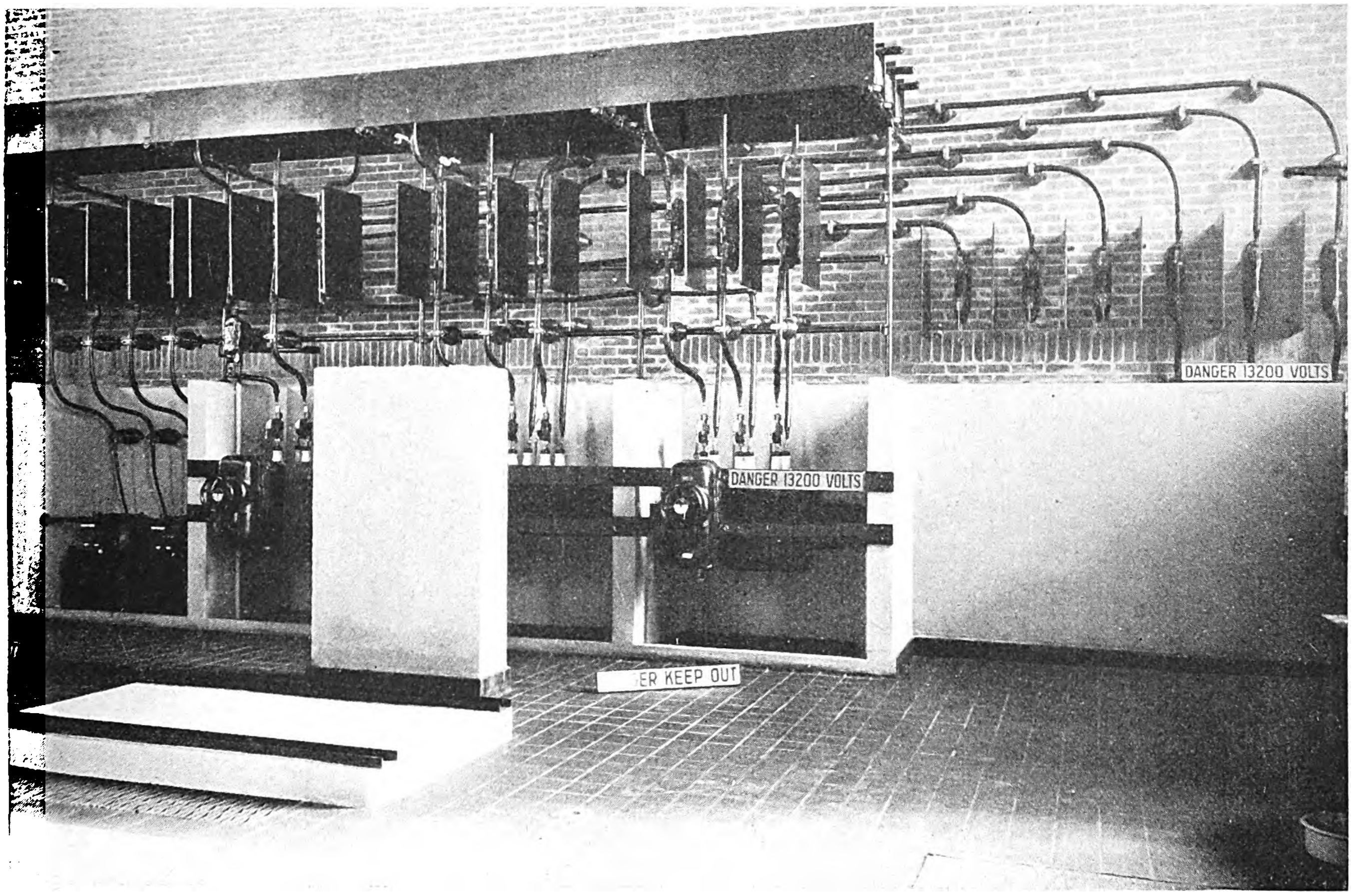
The Montreal Tramways maintains a power station at Hochelaga, which contains two 12,500-kw. turbo-generators, supplying three-phase alternating current at 12,600 volts, 60 cycles, and also a direct-current standby plant, containing two 1,000-kw. and one 2,000-kw., 600-volt direct-driven units. This power station is not used in regular service, the boilers being banked during the winter. They are called on only occasionally. In summer purchased power is used exclusively.

Synchronous converters, synchronous motor-generators and induction motor-generators are all used for conversion of the power to direct current, in addition to the new rectifier units. Rating of equipment in the various substations is given in the accompanying table.

The new substation is situated at 3980 Wellington Street, in the center of the business district of Verdun. The engineers of the tramway decided that on account of the location it would be imperative to install equipment free from the ordinary noise and vibration usually associated with power stations. It was also considered desirable to provide full automatic operation, in line with the policy of the company for utilizing this class of apparatus wherever possible.

The station has been constructed and was placed in service on Feb. 10, the control switches being closed by Mayor J. P. Dupuis of Verdun in the presence of a large number of prominent civic representatives and tramway officials. The effect of placing the station in operation has been to improve materially the power distribution system of the company in this section.

The equipment is housed in an attractive brick building, 34 ft. 3 in. x 75 ft. 8 in., inside measurements. As shown in the interior views, the high-tension switching



these two views. The alternating current enters through the high-tension
rrent through the feeder lines at the left

3. Low cost of maintenance.

4. Simplified control as compared with the apparatus for starting and synchronizing rotary converters or motor-generators.

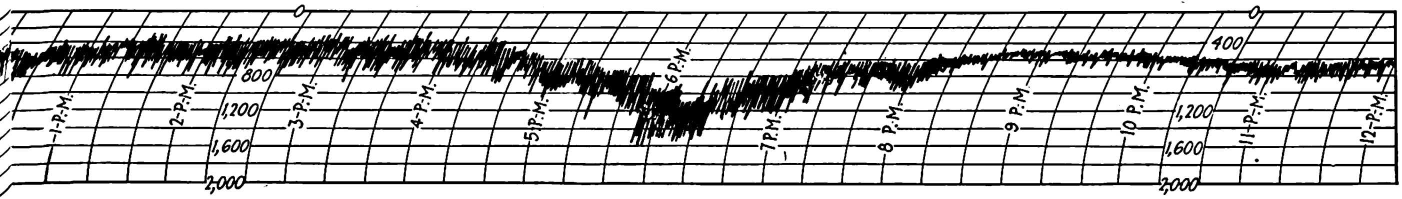
5. Absence of noise and vibration.

Four mercury-arc rectifiers, each rated at 600 volts and 1,000 amp. d.c., with the necessary transformers and control equipment, make up the installation. These rectifiers are assembled in pairs, each with a single three-phase transformer, in order to simplify the wiring and control equipment and to reduce the cost. There is provision for a third set of rectifiers, which will bring the station capacity up to a total of 3,600 kw. of direct-current output.

At present three-phase, 62½-cycle, 12,000-volt power is taken from the Montreal Light, Heat & Power Company's lines at Gate Avenue and Bond Street, at a point near the Montreal water works aqueduct, from where it is carried in an underground No. 00 three-conductor cable running directly to the substation. The line terminates in a pothead in the basement, from where the three leads are carried to a set of hand-operated 300-amp. disconnect switches at the front of the station. Provision is made for the entrance of a duplicate power line when needed. These may be seen at the extreme right of the general view of the main floor. The current then goes through a three-pole, single-throw, 250-amp., 24,000-volt oil circuit breaker, operated by Brown-Boveri type N-4 motor control. It is controlled by the line voltage through a potential transformer. The breaker is closed automatically when there is voltage on the line and is tripped by a no-voltage relay when the voltage is off. It can thus be controlled from the power station. The breaker is protected by type H-4 series overload relays which are set for a definite time. If these relays operate they trip and lock out the breaker, which cannot reclose until the lockout is reset manually. Through selectivity with the breakers between the a.c. bus and transformers the line breakers will trip by overload only in the event of a short circuit on the a.c. bus and under these conditions it is not desirable to reclose them.

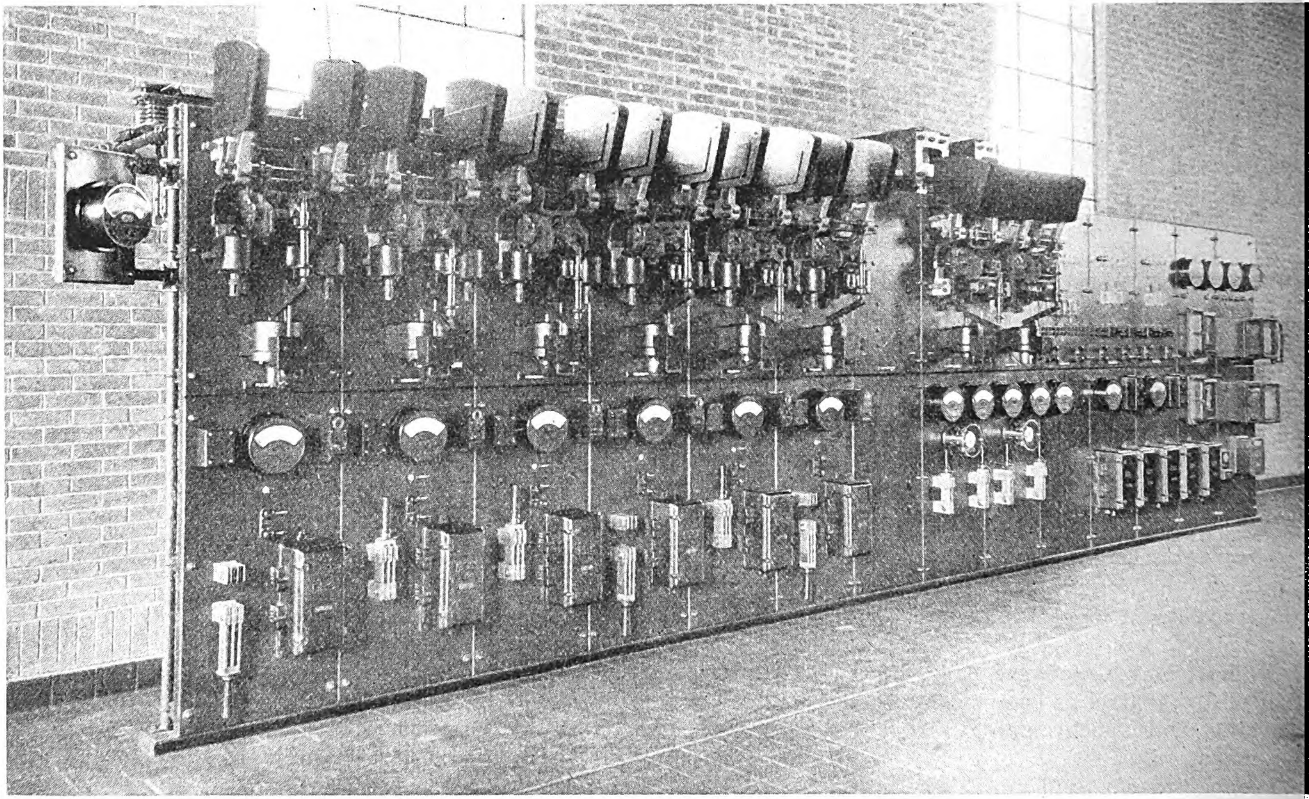
A second set of disconnect switches on the station side permits the line breakers to be cut out of circuit entirely for inspection or setting. From the main alternating-current bus the current is taken through a set of disconnects and circuit breakers to the primaries of the 1,800-kva., three-phase, 12,600-volt transformers, where the pressure is stepped down to a value suitable for the rectifiers, and also is converted to six phase.

The circuit breakers between the a.c. bus and rectifier



me on again at 5:20 a.m. when the voltage drop on the line became sufficient to actuate the starting relay transformers are operated by type N-4 motor control and are protected by H-4 overload relays set for instantaneous tripping on overload. If tripped by overload these breakers will reclose after intervals of ten seconds, one minute and three minutes. If tripped after the last closure the breakers will lock out and will not close again until the lockout is reset.

Each transformer has twelve secondary terminals and a neutral, as the windings are in duplicate to supply the two rectifiers independently. The neutral is grounded and forms the negative side of the d.c. circuit. The mercury cathode forms the positive d.c. terminal, and is connected to the 600-volt bus through suitable switches and circuit breakers.



General view of the direct-current switchboard. The feeder panels are at the left and the control for the rectifiers at the right

RECTIFIERS AND VACUUM PUMPS

The conversion units are Brown-Boveri type GRZ-56 mercury-arc rectifiers, each rated at 1,000 amp. and 600 volts d.c. output. Two of these rectifiers make up a unit which is rated at 1,200 kw.

Each rectifier is incased in an airtight steel shell which contains six anodes, each connected to one of the transformer terminals. The single cathode consists of mercury in a receptacle at the bottom of the pot. Auxiliary anodes are included to insure continuity of the arc and for starting the action when the rectifier is switched into circuit.

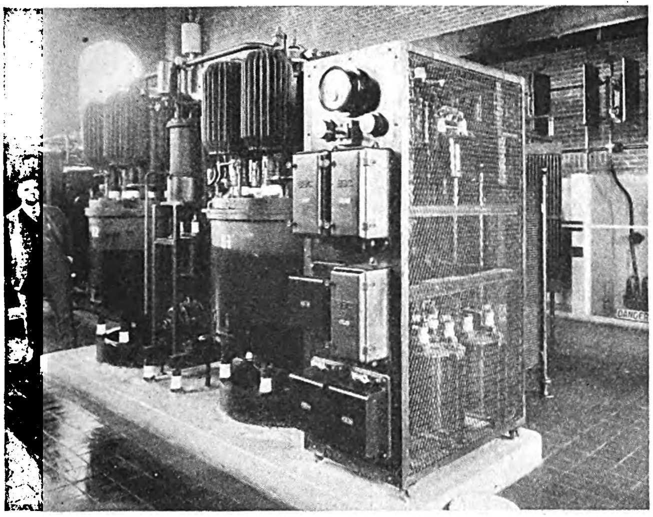
Since the casing of the rectifier is entirely of steel and the interior is not lined with insulating material the pot is at the potential of 600 volts above ground. It is therefore necessary to protect against accidental contact with the casing, which is done by the metal screens which surround the apparatus.

Successful operation of the rectifiers demands that a pressure of the order of 0.01 to 0.001 mm. of mercury be maintained. Since it has not been found practicable in commercial rectifiers to prevent small infiltration of gases it is necessary to pump them out as fast as they enter the case. For this purpose a high-vacuum mercury pump is connected in series with a rotary oil-immersed pump. The rotary pump is driven by a $\frac{1}{2}$-hp. a.c. motor and forms the only normally moving part in the entire station. Their operation is independent of the rectifiers and they will maintain the vacuum whether or not the latter are connected to the circuit.

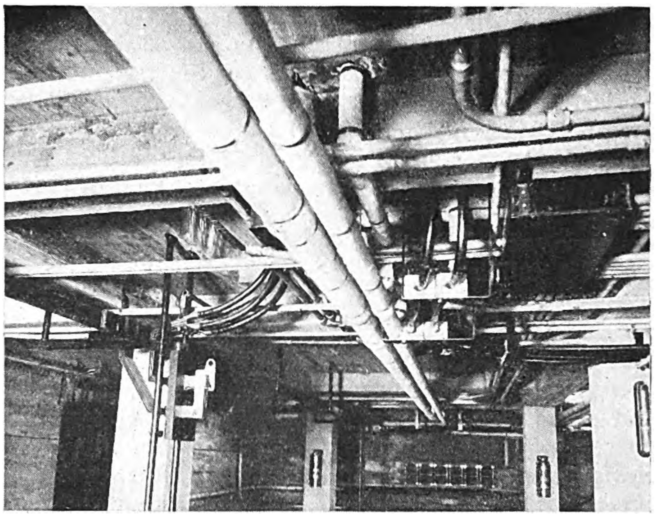
The current that may be drawn from the rectifier is determined mainly by the temperatures that may be endured by the working parts. In order to make the rating as large as practicable, the rectifiers are cooled by means of water circulated through jackets. This water, which is drawn directly from the city mains, is first passed through the cathode base, from there to the jacketing around the large cylinder and the anode plate, after which it passes to the jacket surrounding the condensing cylinder and then out to the sewer. The quantity of water required is about one-third gallon per minute per 100 amp. d.c. at an intake temperature of 15 deg. C. A small additional amount for the vacuum pump is needed. In view of the small amount of water and the desire to eliminate moving machinery wherever possible, it was decided not to attempt the use of a recooling system. It also was considered inadvisable to attempt recooling during the severe winters, as the heat loss in the station is so small that there would be insufficient protection against freezing.

CONTROL AND PROTECTIVE DEVICES

The rectifier station is cut out of circuit entirely if the current falls below a predetermined value. This value is now under process of determination so that the station will go off the line during the hours of the night when the demand is lightest. The station is cut



Near view of one of the mercury-arc rectifier units. Each of the rectifiers is rated at 600 kw., so that the set has a total capacity of 1,200 kw.



This view was taken directly beneath one of the rectifier units to show the connections and the pipes for conveying the cooling water

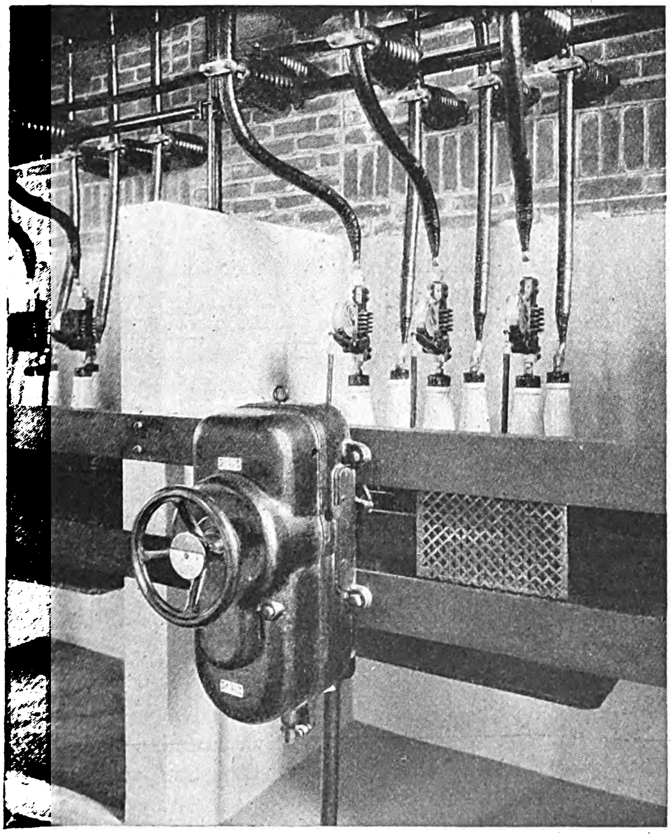
in automatically by low voltage, so that it comes on the line in the morning when the cars begin regular day service. The value for this relay setting is likewise being determined.

As the current drawn from the a.c. line passes full load on the first rectifier unit (2,000 amp.) the second unit is cut into circuit automatically. It is also possible to arrange the relays so that the second unit will be cut in and out of circuit by means of a time clock. At present the latter method is being followed.

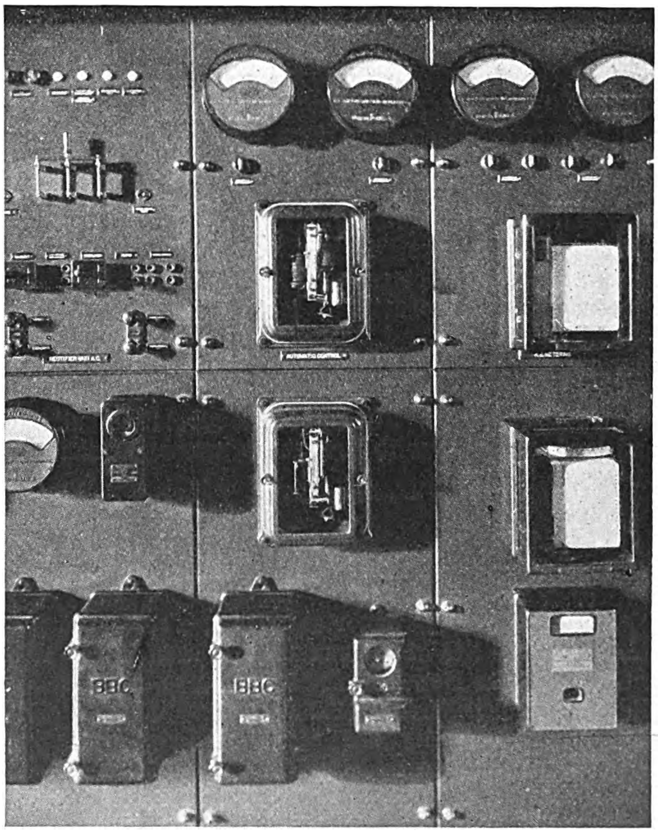
A full set of automatic devices prevent damage to the equipment if load should become excessive or if some part should fail. The action of the oil circuit breakers has already been described. If the breakers on one of the rectifier units are locked out the second group immediately will come into service. Thermal relays in the rectifiers and transformers protect against prolonged overheating. Low vacuum or failure of the cooling water supply will also automatically lock out the rectifiers.

Signal lamps on the switchboard indicate the positions of the circuit breakers. Each rectifier group has five four-point selector receptacles on the switchboard, so that the rectifiers can be started by clock, low voltage, low current or manually, as desired, depending on the position of the plug in the receptacles.

Efficiencies guaranteed for the equipment, as meas-



One of the oil circuit breakers and the alternating-current time-element relays on the incoming 12,600-volt line



The automatic control relays for the mercury-arc rectifiers are located on the main switchboard. At the right are the graphic watt-hour meters ured between the incoming 12,600-volt a.c. lines and the d.c. bus, including the transformers and all auxiliaries, were as follows: At 1¼ load, 93.5 per cent; at full load, 94 per cent; three-fourths load, 94 per cent; half load, 93.5 per cent; quarter load, 91.4 per cent. For the period between Feb. 15 and Feb. 28 the ratio of total output of the station to total input was 89.2 per cent. During this period the load factor was very low and there was relatively little time that the rectifiers were carrying full load.

PUTTING THE EQUIPMENT IN SERVICE

After the rectifiers had been installed they were operated at greatly reduced potential to dry them out and permit the vacuum to be raised to the operating maximum. This was accomplished by means of a water rheostat load of 1,000 amp. at 89 volts, which was continued for about 30 hours on each of the four rectifiers in turn. By this means the occluded gases and water vapor were driven out of the anodes.

The only difficulty of any moment that has been encountered in the operation of the station is interference with some of the telephone lines of the local system. The difficulty occurs on party lines with grounded equipment. In some instances there is a high-frequency note, which has been identified as the sixth harmonic of the alternating current wave. Through co-operation of the telephone company it is expected that the trouble will be eliminated in the near future.

A feature of operation that seems inherent during the first few months of operation of the converters is what are known technically as "backfires." While it is not possible to observe the phenomenon directly, it appears to be in the nature of a short circuit between the cathode and one or more of the anodes. When this occurs, the effect is to throw out the a.c. rectifier breaker and in some instances the incoming line breaker. This immediately extinguishes the arc and the rectifier goes back on the line within ten seconds. In no case has this momentary interruption caused any trouble. As the rectifiers remain in service these backfires are becoming less pronounced, and experience with rectifiers in other installations indicates that in the course of a few months they will disappear entirely.

The rectifying apparatus was manufactured by Brown, Boveri & Company of Baden, Switzerland, and the American Brown Boveri Company of Camden, N. J. The installation was made by Griswold & Company, Ltd., of Montreal, while the layout, general engineering and building design were carried out by the engineers of the Montreal Tramways. The cost of the substation building and land, complete with equipment, was approximately $140,000.

Data on Rochester Property Reveals Railway's Importance

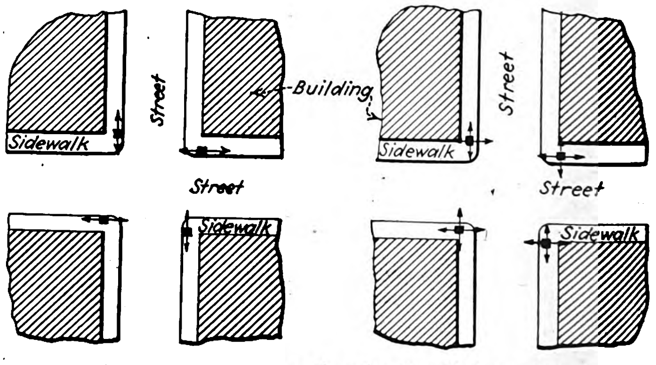
EVIDENCE of the important rôle of a railway industry in the life of a community is seen in the 1926 activities of the New York State Railways in Rochester. These lines purchased materials and supplies totaling $843,171 in the city and paid the following taxes: $43,729 on real estate, $143,980 on special franchise, $7,056 on sprinkling, $41,078 for snow removal and $166,371 for paving.

There are 1,700 employees on the Rochester lines of the New York State Railways and the payroll annually totals $2,841,840.

Chicago's Traffic Lights Shine Four Ways

FOLLOWING nearly a year's experiment with the co-ordinated lights installed in the Loop at Chicago, the city determined that better results would be possible if the signals were displayed in all four directions and the change was effected overnight late last year. As originally installed, each traffic standard was designed to exhibit signals in two directions only, as shown in the upper diagram. Pedestrians who congregated at the curb about to cross could not readily observe whether the traffic signals were green or red unless they looked diagonally across the intersection. The change effected was to install additional sets of lamps on the heretofore blank sides of the signal units so that now the signal is exhibited from all four sides of each standard. This has been found an improvement, principally in the aid of pedestrian traffic at the intersections. At present there is no ordinance in Chicago compelling pedestrian observance of traffic signals. Traffic police are urging observance, however.

Typical signal light standard in Chicago Loop as it now appears changed to shine in four directions



Typical street intersection in the Chicago Loop

The view at left shows the location and direction in which the signals were exhibited in the original installation. The view at right shows the situation after the change made by adding lights so that the signals would be shown in all four directions, chiefly to aid pedestrian traffic.

The lamp pedestals were made in standard units so that by removing blank plates on the sides and substituting reflectors, lamps and hoods the new lamps were readily installed.

An article on the co-ordinated lights in the Chicago Loop district appeared in the March 27, 1926, issue of the JOURNAL.

Base Plate Joint Developed by Eastern Massachusetts Street Railway

By Frank B. Walker
**Chief Engineer Eastern Massachusetts Street Railway,
Boston, Mass.**

Some of the special welded rail joints made by the Eastern Massachusetts Street Railway and tested in the Riehle machine at the Massachusetts Institute of Technology

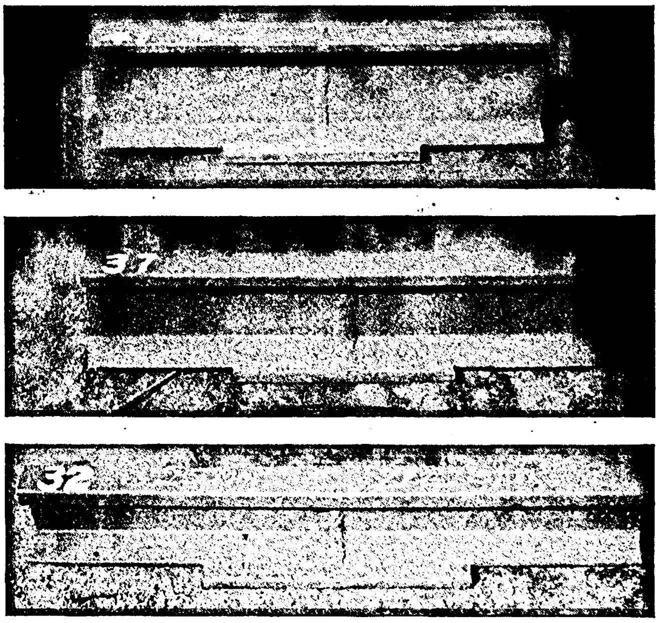
Bending tests show average strength to be approximately equal to or greater than that of fish plate joint. Internal stresses due to heat are eliminated. Cost greatly reduced. Repair of broken rails simplified

EXPERIMENTS recently made by the Eastern Massachusetts Street Railway lead us to believe that a simple rail joint using only a single welded base plate can be built adequately strong at about one-half the cost of a fish plate joint. During the course of our experiments we have welded and broken in a testing machine a large number of joints of various designs. Data from these tests are presented in this article for constructive criticism and in the hope of encouraging experimentation by others. We realize, of course, that the relative durability of the new and old joints can be determined only after actual installation in track, but we feel that the new type has great possibilities.

Undue importance frequently has been attached to strength in a welded rail joint. Nevertheless, strength tests are the only quick means of comparing different types of joints. We know that fish plate joints for 9-in. grooved girder rail, 7-in. high tee rail and 75-lb. low tie rail are strong enough. We have over 110,000 of these joints in our tracks, and since 1921 we have had a breakage of less than one joint per 1,000 per year on the 9-in. and 7-in. rail. In bending tests with 30-in. span, our welded fish plate joints on 75-lb. rail carried an average of 80,600 lb. Among the many joints of this type on our property failures have been extremely rare. Even the weaker joints on old 48-lb., 56-lb. and 60-lb. rails have given us very little trouble. The yearly rate of failures of all standard fish plate joints in service has been about three-tenths of 1 per cent. Each year's record has been better than that of the preceding year. We believe, therefore, that the strength developed by the present joints may be considered sufficient.

Although strong enough, the present joints do not make efficient use of the available metal. Wheel loads on a suspended rail joint cause compression in the head and tension in the base. Wheel loads on a supported joint cause tension in the head and compression in the base. In either type there is little stress in the web. The metal in the fish plates, therefore, is poorly placed to do its work efficiently. As we nearly always suspend our joints between ties, a welded base plate provides metal where it will carry the tension most efficiently.

The use of base plates in addition to fish plates in welding joints is common practice. We have used them from time to time on our system, but we never con-



Base plate joints developed by Eastern Massachusetts Street Railway

At top, 9-in. grooved girder rail with 1-in. x 7-in. x 16-in. plate.
In center, 7-in. tee rail with 1-in. x 7-in. x 16-in. plate.
At bottom, 75-lb. tee rail with $\frac{7}{8}$-in. x 7-in. x 16-in. plate.

GENERAL SUMMARY OF BENDING TESTS

Rail	Load at Yield, Pounds Fish Plate Joint	 16-In. Base Plate Joint	 36-In. Base Plate
9-in. grooved girder...	266,300	246,500	....
7-in. high tee........	163,750	177,750	307,750
75-lb. tee............	80,600	110,000	135,500

length eliminates two tie plates. Rail heads are kept in contact to provide for compression. Together, the beading and the base plate take the shear and tension caused by temperature changes.

BASE PLATE JOINT SHOWS STRENGTH EQUAL TO OR GREATER THAN FISH PLATE JOINT

This joint is at least equal in strength to the fish plate on 9-in. grooved girder rail and superior to it on 7-in. and lighter tee rail. Even in the event of reversal of stresses, this type of joint seems strong enough, as indicated by a test wherein a load of 75,000 lb. was carried with the joint upside down. Data presented in an accompanying table and the photographs reproduced show in detail the results of our experiments. The results of the bending tests are summarized in the tables on this page.

SUMMARY OF TESTS ON 9-IN. GIRDER RAIL

Standard Joint with ¾-In. × 36-In. Welding Bars; Top and Bottom Seams

Test No.	*Cost	Load in Pounds Yield Point	 At Failure	Remarks
18	$5.59	285,000	287,500	Broke through plates, at center on one side, through bolt holes on other.
19	5.75	225,000	313,000	Deflected 11/16-in. but did not break.
38	6.33	222,700	222,700	Broke plates through bolt holes.
Average....	$5.89	266,300	274,440	
Joint with 1-In. × 7-In. × 16-In. Plate Welded to Base and Web; Base of Joint Seam Welded				
11	$2.70	240,000	240,000	Broke through welding. Seams very light.
12	2.70	292,000	292,700	
20	2.30	256,800	256,800	Broke rail from joint at head to end of base plate.
41	1.20	197,100	197,100	Broke through rail outside of base plate.
Average....	$2.23	246,500	246,600	

*Costs include all labor and material except rail.

SUMMARY OF TESTS ON 7-IN. TEE RAIL

Standard Joint with ¾-In. × 26-In. Welding Bars; Tops and Bottoms Welded.

Test No.	*Cost	Load in Pounds Yield Point	 At Failure	Remarks
16	$4.12	145,000	159,000	Did not break.
17	4.12	150,000	177,000	Did not break.
34	4.18	184,800	184,800	One plate broke at joint.
35	4.21	155,200	155,200	Broke through plates at joint.
Average....	$4.15	163,750	169,000	
Joint with 1-In. × 7-In. × 16-In. Plate Welded to Base and Web; Base at Rail Welded				
14	$2.05	269,200	269,200	Broke rail from rear joint at head to near end of plate at base.
36	1.54	134,350	134,350	
37	1.93	128,100	128,100	
Average....	$1.84	177,220	177,220	
Joint with 1-In. × 7-In. × 36-In. Base Plates				
28	3.48	303,000	362,500	Defl. 1⅜ stretched plate
29	3.67	312,500	358,000	

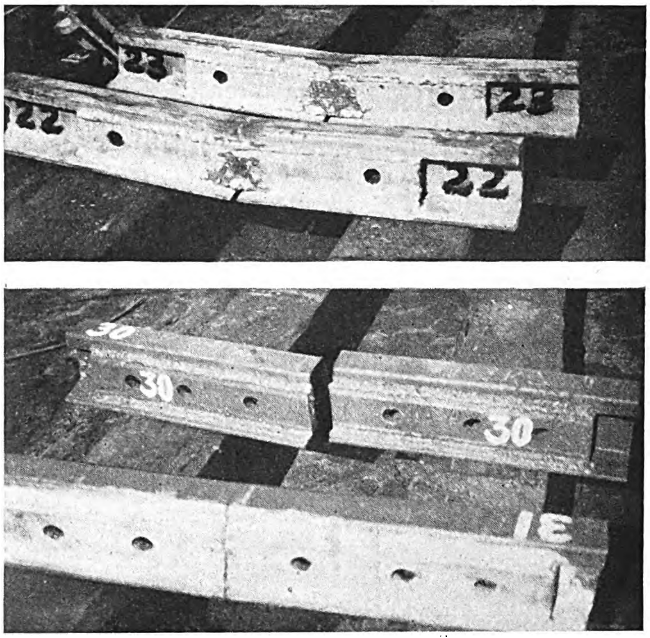
*Costs include all labor and material except rail.

SUMMARY OF TESTS ON 75-LB. RAIL

Standard Joint with ¾-In. × 24-In. Welding Bars; Top and Bottom Welded

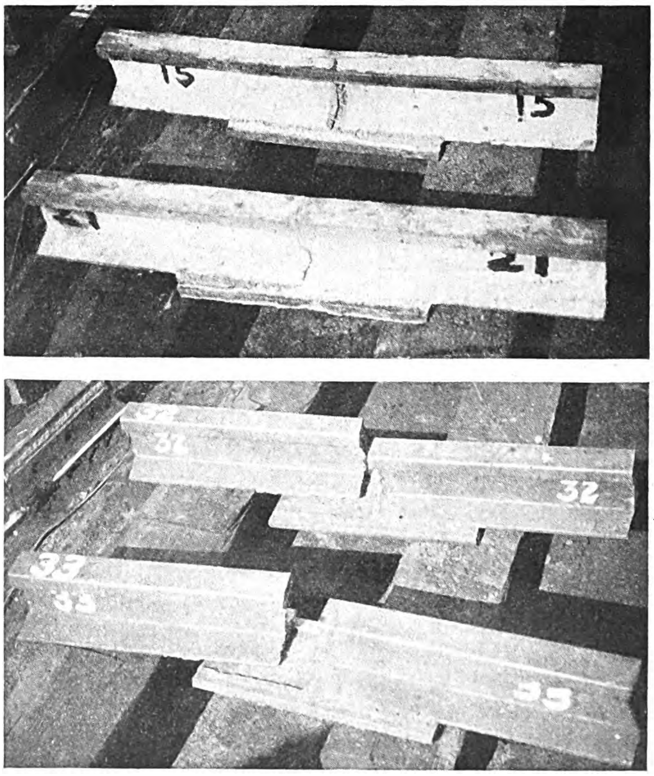
Test No.	*Cost	Load in Pounds Yield Point	 At Failure	Remarks
22	$3.11	77,600	77,600	Deflected 1-in. but did not break.
23	3.11	81,400	81,400	Did not break.
30	3.13	82,700	82,700	Broke through plates.
Average....	$3.12	80,600	80,600	
Joint with ⅞-In. × 7-In. × 16-In. Plate Welded to Base and Web; Base of Rails Welded				
15	$1.86	124,700	124,700	Cracked through welding, seams very light (single).
21	1.98	120,000	120,400	
32	1.49	99,000	99,500	
33	1.94	96,000	97,900	
Average....	$1.82	110,000	110,600	

*Costs include all labor and material except rail.



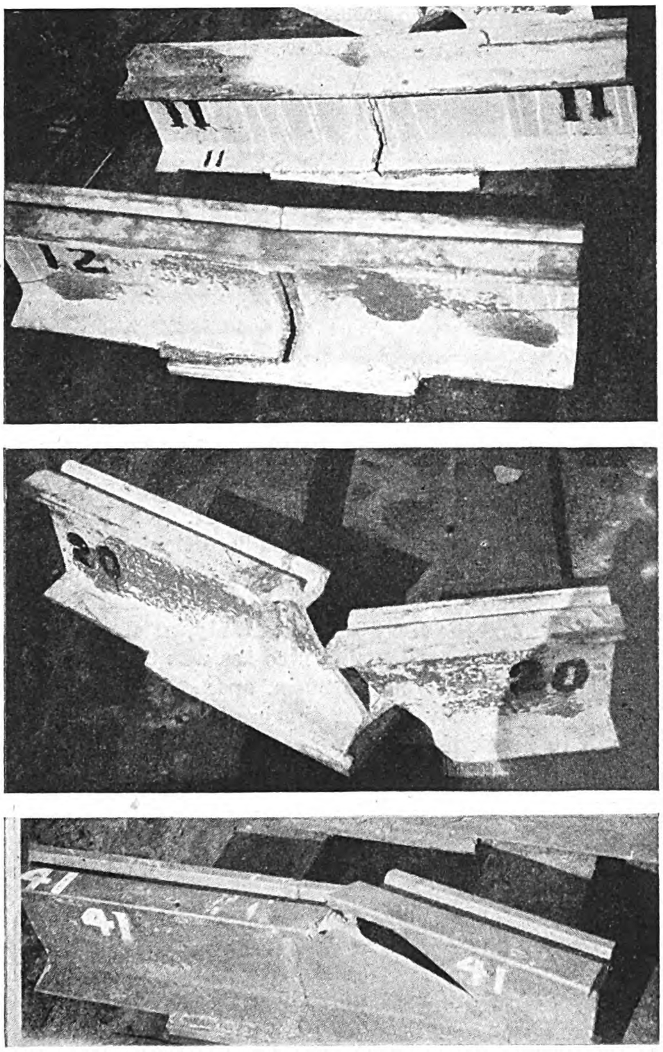
Standard joints Nos. 22, 23 and 30 with ¾-in. x 20-in. fish plates on 75-lb. tee rail failed at an average load of 80,600 lb.

The bending tests were made at the Massachusetts Institute of Technology by Prof. H. W. Hayward and the writer on the 400,000-lb. Riehle machine. While in some instances the distance between supports was 20 in. and in others 30 in., the data included in this article are for the 30-in. span only, as it appeared that the influence of shearing stresses was too great for satisfactory results on the 20-in. span. Tests on this span, however, showed that the base plate was strong enough to break the rail.



Joints Nos. 15, 21, 32 and 33 with ⅞-in. x 7-in. x 16-in. base plate on 75-lb. tee rail failed at an average load of 110,600 lb.

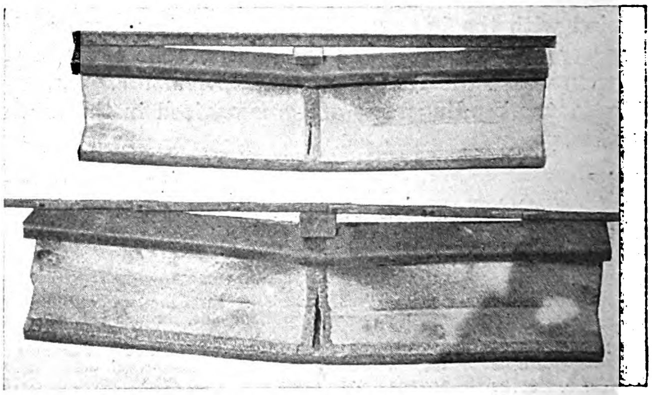
Our series of test joints were made with three types of rail, 9-in. girder section 104-401, 7-in. high T-section 91-282 and 75-lb. T-section A.S.C.E. Welding was done by this company with the metallic arc, using a $\frac{5}{32}$-in. rod and by the Thomson Research Laboratory of the General Electric Company with the hydrogen or shielded arc. Eight kinds of joints were made: (1) Rails V'd out and welded together without plates; (2) with fish plates only; (3) with 6-in. x 6-in. x $\frac{3}{4}$-in. base plate only; (4) with 7$\frac{1}{2}$-in. x 10-in. x $\frac{3}{4}$-in. base plate only; (5) with 7-in. x 16-in. x $\frac{3}{4}$-in. base plate only; (6) with 7-in. x 16-in. x $\frac{7}{8}$-in. base plate only; (7) with 7-in. x 16-in. x 1-in. base plate only; (8) with 7-in. x 36-in. x 1-in. base plate only. No pressure was put upon the rails before or during the welding to bring the heads under compression. The short sections of rails were simply laid together on ties and the plates welded in the usual way, on alternate sides to relieve stresses.



Joints Nos. 11, 12, 20 and 41 with 1-in. x 7-in. x 16-in. base plate on 9-in. grooved girder rail failed at an average load of 246,600 lb.

Two joints on 7-in. tee rail with 7-in. x 36-in. x 1-in. base plates were tested. The first had a yield load of 312,000 lb. and carried a maximum load of 358,000 lb. The second had a yield load of 303,000 lb. and a maximum load of 362,000 lb. These loads are almost double those carried by the fish plate joints and the 16-in. base plate type. The results of these two tests lead us to believe that a 7-in. x 28-in. x $\frac{3}{4}$-in. base plate joint will have adequate strength for all practical purposes. We are proceeding with the installation of this type joint in our track.

Some of these joints were made with single and some with double beads. The work was done at two locations by different welders. This variation was intentional in order to secure a wider range of data. Some were made with good and some with poor head contact. Welding was carelessly done on a number of joints. Some joints were made with head welds and in others the webs of the flanges were welded together. For example, one had no welding on the web and was so cut that the rails were separated about $\frac{1}{4}$ in. The head was sawed at a slight angle so that there was only a partial contact. Others had no head contact when welded, but the head gap was later filled in with thin steel inserts.



Two joints on 7-in. tee rail with 7-in. x 28-in. x $\frac{3}{4}$-in. base plates carried maximum loads of approximately 360,000 lb.

It will be noted that in the tests on the standard fish plate type of joint there were no rail failures, whereas on the base plate type a number of the rails failed. Failure of the rail itself shows that it is weaker than the joint and therefore the rail failures with base plate joints indicate that these joints are stronger than the fish plate joints which did not cause rail failure. As a result of observing the actual tests and the character of the failures, we believe that they were tension failures due to bending, although there may have been a combination of bending and shearing.

Our experiments lead us to the conclusion that the base plate joint has great possibilities. In addition to the advantage of low cost, it has the added virtue of eliminating internal stresses due to heat, a serious fault in the welded fish plate joint. Moreover, as a result of our tests information has been secured which will enable us to repair broken rails with greater confidence than was possible heretofore.

Suggests Eliminating Parking in Downtown Grand Rapids

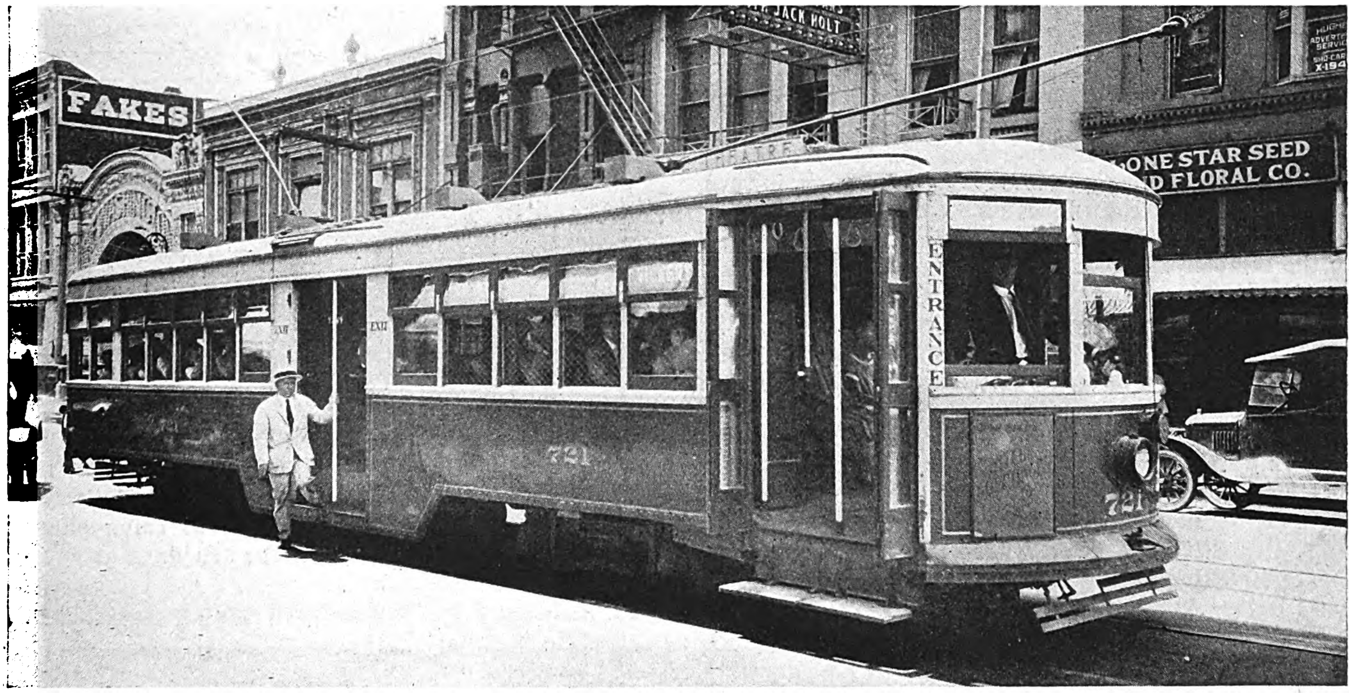
GRAND RAPIDS, Mich., is considering its traffic congestion problems and the important factor of parking in the downtown district. Much research has been carried on in safety and traffic circles regarding the solution of the problem and Safety Director Sinke is studying the theory of Fred M. Deane, a business man of the city. Mr. Deane's decision is based on the belief that 75 per cent of the automobiles parked downtown are not needed during the business day and deprive others of valuable space in the crowded area.

Making Partners of Our Customers

The Dallas Railway & Terminal Company has sold 7,604 shares of 7 per cent preferred stock to 1,996 car riders and employees. About 98 per cent of the regular employees bought stock

By Richard Meriwether

Vice-President and General Manager Dallas Railway & Terminal Company
Dallas, Tex.



New cars of the type illustrated were placed in service at the start of the campaign, 30 cars costing $15,500 each being received in the fall of 1926

One of the outstanding papers presented at the convention of the Southwestern Public Service Association held at New Orleans this week was Mr. Meriwether's story of the enrollment of citizens of his city as stockholders in the local railway company. His paper, of which this article is an abstract, tells of the methods used in this successful campaign for customer ownership.

CUSTOMER ownership of public utilities has had an amazing impetus in the past ten years. During 1926 more than $350,000 of new money for capital investment by the utilities was secured through the sale of preferred stock to customers. Customer ownership increased from 4,044 new customer-owners added in 1914 to 300,000 added in 1925. From statistics I have been able to gather the number added in 1926 was approximately 400,000.

Utility stocks sold to customers are becoming more and more widely distributed. Each new stockholder in 1924 purchased an average of 22.8 shares. In 1924 the average was 8.3 shares. In other words, the stock is now being sold in small lots to a greater number of customers. At the beginning of 1927 approximately 8,000,000 customers of public utilities in the United States owned their securities. This applies, however, in only a very limited sense to the stock of companies engaged solely in the operation of street railways, very few of them having sold stock to their customers.

The situation with reference to street railways is not due to apathy on the part of the management of such companies, but since the World War the rates which have been in effect have very generally been inadequate and, consequently, the net earnings have been such that street railway securities have not been attractive investment. However, in recent years the financial condition and earnings of a limited number of street railways have been such that a few companies have been able to offer their stock to their customers.

The Dallas Railway & Terminal Company is one of the companies operating solely a street railway system which has offered its stock to its customers. During the fall of 1926 this company, after having revamped its financial structure, offered a block of its 7 per cent cumulative preferred stock to its patrons and employees in Dallas. The stock selling campaign, extending over a period of more than 3½ months, was eminently successful. During this time 953 employees purchased

1,779 shares and 1,043 customers purchased 5,825 shares, or a total of 7,604 shares to 1,996 stockholders. About 98 per cent of the regular employees of the company purchased stock.

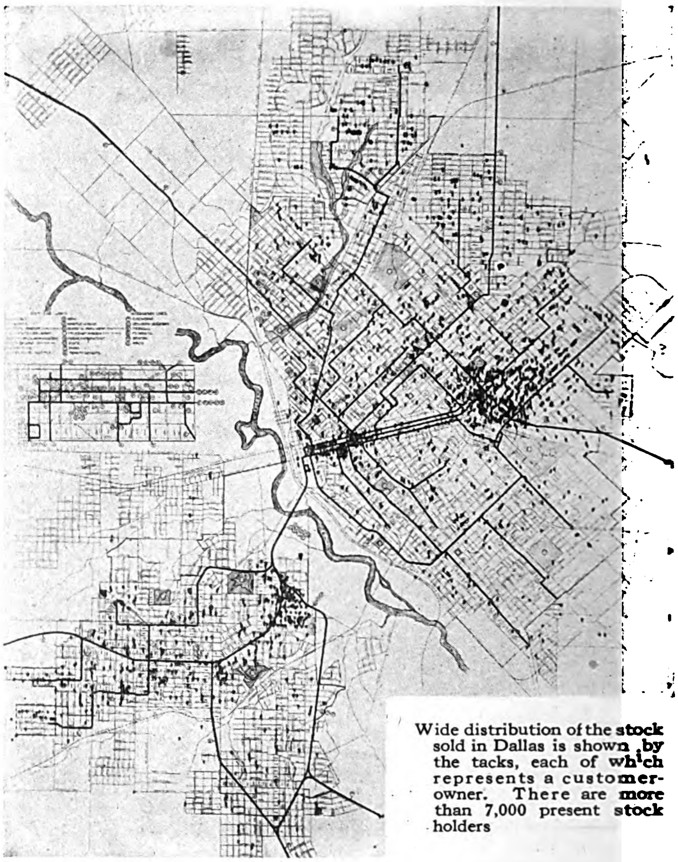
The stock is a 7 per cent preferred stock, selling at $98 and accrued dividend. It could be purchased either for cash or on a monthly payment plan at $10 per share down and $10 per month per share until paid out. Employees selling the stock were allowed a commission of $3 for the first share sold for cash to any one customer and 50 cents per share for additional shares sold to the same customer. On the time-payment plan they were allowed $2 for the first share and 50 cents per share for additional shares sold to the same customer. The commission on the time-payment plan was due only after 40 per cent of the payment had been made by the customer.

ENTIRE CAMPAIGN HANDLED BY COMPANY'S OPERATING ORGANIZATION

The campaign was carried on entirely by the operating organization, under the direction of the company's executives. First, the department heads were called together and the plan explained in detail. They, in turn, held meetings of the employees in their respective departments, at which complete information with respect to the company, in printed pamphlets, and helpful suggestions as to selling the stock were furnished the employees. The employees were encouraged to buy the stock themselves, as well as to try to sell it to their neighbors, friends and acquaintances and all those with whom they came in contact.

Six of our street cars were painted white, and the following inscriptions in black appeared at different locations on the cars:

"Invest in Our Preferred Stock.
"It Pays Over 7 Per Cent.
"It's Safe.
"Ask Any of Our Employees."



Wide distribution of the stock sold in Dallas is shown by the tacks, each of which represents a customer-owner. There are more than 7,000 present stock holders

These white cars were placed in regular service the morning our campaign opened and served as a startling announcement to the public that the Dallas Railway & Terminal Company preferred stock was being offered to them. These cars were run for ten days after the opening of the campaign.

In addition, two double-faced posters, carrying a

SAFETY
STATE
ASK ANY OF OUR EMPLOYEES
IT'S SAFE
INVEST IN OUR PREFERRED STOCK
IT PAYS OVER 7%
IT'S SAFE

Six of the Dallas cars were painted white as moving billboards announcing the stock-selling compaign. These cars were run on all routes of the system for ten days at the beginning of the drive

In his paper MR. MERIWETHER *gave the advantages to investor and management of customer ownership. Briefly stated, these are:*

Advantages to the Investor

1 The small investor having only a few hundred dollars is just as welcome a stockholder as the man with thousands. Facilities are accorded for partial payments, so in time a fair-sized investment may be made without a heavy burden on the man of moderate means.

2 The customer-owner invests in something he can see from day to day. Knowing how his money is being spent, he has a feeling of security greater than if the property were not under his personal observation.

3 Since the utilities are usually subject to public supervision there is little chance that the investor stands to lose on account of improper handling of the funds or manipulation of the stock.

4 The business being a public necessity its earnings are fairly consistent throughout the year. This reduces the possibility of failure to pay dividends at regular intervals.

5 The stock of the utility is well known in the community and is readily accepted by banks as collateral, or can be sold readily.

Advantages to the Management

1 Customers becoming part owners of the utility take a greater interest in its affairs and problems. Being better informed they are more inclined to be sympathetic and helpful when adverse conditions arise affecting their company, whether due to unjust treatment through political activities, inadequacy of rates, or any other situation which unfavorably affects the progress and prosperity of the utility.

2 Customer-ownership campaigns always result in enrollment of a large number of employees as investors. This lessons likelihood of labor troubles, as employees will inform themselves of the company's problems and be less inclined to make unreasonable demands. Greater loyalty is induced by the participation in the profits of the company through the medium of dividends.

3 The general public benefits because dividends will usually be spent or invested in the locality where they are earned, thus adding to the local wealth.

4 Wide distribution of the securities of a public utility in the community it serves is a potent safeguard against municipal or goverment ownership agitation.

message to the public, were pasted on the windows of each car in service. During the progress of the campaign these posters were changed from time to time. Car cards on the inside of each car asked the public to buy the preferred stock from the motormen and conductors.

Looking east on Main Street from Field. The lines of the Dallas company come into the business district through this crevasse in the Texas city's wall of skyscrapers

Just prior to the opening of the campaign a four-page circular, announcing the sale of the stock, was mailed to a large selected list of possible investors. On the day the campaign opened full page ads, announcing the first sale of the company's stock to the public, were run in all the daily newspapers. Newspaper advertising was used regularly throughout the period of the campaign.

Weekly meetings of the employees of each department, at which stock-selling ideas were exchanged, and the progress of the campaign reported, served to keep up the "pep" and enthusiasm of the employee-salesmen. The campaign developed an interest among the employees in the company's affairs that could hardly have been accomplished in any other way; and the time-payment plan has encouraged many employees to save who heretofore had squandered much of their surplus.

With its patrons and the public generally, the selling of its stock locally has established the company as a home institution in the community, and it occupies a position of high regard and favor.

Special Committee Works Toward Uniform Traffic Signs

LEON R. BROWN, safety director of the New York State Railways, Rochester lines, is head of a special committee of the Rochester Engineering Society which will work with the American Engineering Council in establishing a uniform system of traffic signs, signals and markings in Rochester. The committee is making a survey, the results of which will be sent to the national council. The Rochester Safety Council and the Automobile Club of Rochester also are co-operating in the enterprise.

350,000,000 Passengers a Year

Transit Commission Presents Figures of Traffic Carried Into and Out of New York City in 1926 by the Railroads and Ferries

RAILROADS and local ferries carried 350,000,498 passengers into and out of New York during the calendar year 1926, according to figures just compiled by the Transit Commission. As this figure represents two-way traffic, the actual number of passengers was 175,000,249. Counting a year as 340 full traffic days, 514,556 passengers of all sorts daily used the railroads and ferries for round trips to and from New York, of whom 385,253 may be classified as commuters. The difference between the two figures, or 129,303, probably in a measure represents the figure of the average daily number of visitors to New York City.

The figures compiled by the Transit Commission were furnished by the railroad and ferry companies in connection with investigations and studies undertaken by the commission concerning the local commutation problem. For the most part, they are based upon actual counts made by the railroads. They bear particularly upon the commuting problem, which has grown rapidly within recent years.

The figures show that the trunk railroads entering New York or approaching on the New Jersey side in 1926 carried a both-way passenger traffic of 248,138,573 passengers, including commuters, as against 241,900,498 in 1925. In 1926 most of the railroads included in the list showed an increase. Commutation traffic increased decidedly in the year. In addition to the above total of steam railroad passengers carried into and out of the city for 1926 there were approximately 51,894,146 local or rapid transit passengers carried on the lines of the Hudson & Manhattan Railroad and 49,967,779 passengers entering and leaving the city during 1926 on the several ferries, excluding the ferries between boroughs and excluding the railroad passengers using railroad ferries. The inclusion of the Hudson & Manhattan and the local ferry figures gives a total traffic into and out of New York by railroads and ferries of 350,000,498. The steam railroad commuters numbered 160,110,648, and with the Hudson & Manhattan and local ferry traffic, both of which are practically entirely commuting in character, made a net grand total of railroad and ferry commuters of 261,972,573.

The following tabulation represents a comparison of traffic upon trunk line railroads to and from New York in the years 1925 and 1926:

	1925	1926
Baltimore & Ohio	575,000	500,000
Central of New Jersey	15,935,303	16,137,473
Delaware, Lackawanna & Western	22,465,970	22,398,500
Erie	32,293,140	31,719,290
Lehigh Valley	933,153	719,004
Long Island	67,128,993	70,744,844
New Haven	18,717,587	18,180,068
New York Central	35,392,861	37,876,232
New York, Ontario & Western	549,804	532,621
New York, Westchester & Boston	6,628,298	7,390,724
Pennsylvania	41,280,389	41,939,817
	241,900,498	248,138,573

The Hudson & Manhattan Railroad carried a total of 107,054,102 passengers during 1926, of which 70,649,035 were to and from the Cortlandt Street terminal and 36,405,067 were to and from the several uptown stations of this system. This was all exclusive of traffic which began and ended solely in New Jersey or in New York. The traffic to and from the St. George terminal of the Staten Island Rapid Transit lines is also not included.

The following table shows railroad traffic in 1926 upon the various systems:

TABULATION OF STEAM RAILROAD TRAFFIC TO AND FROM NEW YORK FOR THE YEAR 1926

	Commuter, Zone and Family Trip	Other Traffic	Total Traffic
Baltimore & Ohio		500,000	500,000
Central Railroad of New Jersey	12,667,916	3,469,557	16,137,473
Delaware, Lackawanna & Western	16,572,762	5,825,738	22,398,500
Erie	28,811,700	2,907,590	31,719,290
Lehigh Valley			
Pennsylvania Station	59,142	433,074	492,216
Jersey City	159,342	67,446	226,788
Total—Lehigh Valley	218,484	500,520	719,004
Long Island			
Flatbush Avenue	17,325,000	10,444,302	27,769,302
Pennsylvania Station	30,348,000	11,852,133	42,200,133
Long Island City	500,000	225,409	775,409
Total—Long Island	48,223,000	22,521,844	70,744,844
New York Central			
Main Line*	8,415,889	5,084,041	13,499,930
Harlem Division*	12,070,425	2,558,952	14,629,377
Putnam Division†	742,786	170,067	912,853
West Shore‡	7,645,411	1,188,661	8,834,072
Total—New York Central	28,874,511	9,001,721	37,876,232
New York, New Haven & Hartford			
Grand Central	9,293,441	8,203,898	17,497,339
Pennsylvania Station		644,728	644,728
Harlem River Division	34,702	3,299	38,001
Total—New Haven	9,328,143	8,851,925	18,180,068
New York, Ontario & Western		532,621	532,621
New York, Westchester & Boston	2,631,108	4,759,616	7,390,724
Pennsylvania			
Pennsylvania Station	399,401	11,172,475	11,571,876
Jersey City	2,743,554	1,077,552	3,821,106
(*a*) Via Hudson & Manhattan	9,640,069	16,906,766	26,546,835
Total—Pennsylvania	12,783,024	29,156,793	41,939,817
Grand total all lines	160,110,648	88,027,925	248,138,573
(*b*) Hudson & Manhattan			
Cortlandt Street		70,649,035	70,649,035
Uptown stations		36,405,067	36,405,067
Total Hudson & Manhattan		107,054,102	107,054,102
(*c*) Staten Island Rapid Transit Railway	4,144,672	8,855,639	13,000,311

(*a*) This traffic is included in the Hudson & Manhattan total.
(*b*) Exclusive of intrastate traffic in New York and New Jersey.
(*c*) Traffic almost wholly within New York City.
* Includes 125th Street. † Via Sedgwick Avenue. ‡ Via West Shore Ferry.

The Long Island's traffic into and out of the Pennsylvania Station was nearly four times as great as the Pennsylvania Railroad's own traffic to and from that station.

The following table presents graphically the traffic at the principal railroad terminals in 1925 and 1926:

	1925	1926
Grand Central		
New York Central Railroad	23,955,800	26,164,717
New York, New Haven & Hartford	18,028,176	17,497,339
Total Grand Central	41,983,976	43,662,056
125th Street		
New York Central	1,840,276	1,964,590
Pennsylvania Station		
Pennsylvania Railroad	10,787,816	11,571,876
Long Island Railroad	39,038,975	42,200,133
Lehigh Valley Railroad	633,255	492,216
New York, New Haven & Hartford	619,054	644,728
Total Pennsylvania Station	51,654,100	54,908,953
Hudson & Manhattan		
Cortlandt Street	67,005,171	70,649,035
Uptown stations	38,205,544	36,405,067
Long Island Railroad		
Flatbush Avenue station	27,212,747	27,769,302
Long Island City	877,271	775,409
Woodside	2,801,000	3,081,100
Jamaica, including Union Hall Street station	3,466,800	3,986,820
East New York	1,600,000	1,440,000
Staten Island Rapid Transit Railway		
St. George Terminal	12,443,909	13,000,311

Ferry traffic into and out of New York during 1926 showed an increase, passing the 102,000,000 mark for the first time, the total being 102,164,827, an increase of 1,377,000 over 1925. The number of local passengers was 49,967,779, while railroad ferry passengers were 52,197,048 in number.

Maintenance Notes

Street Congestion Increases Car Repairs

By F. E. Geibel
Assistant Superintendent of Equipment
Pacific Electric Railway, Los Angeles, Cal.

WITH additional traffic, the number of flat wheels on our lines has increased considerably during the last few years. A high braking per cent is desirable in order to prevent accidents. Even with brakes in good condition, much depends on the speed, condition of rails and motormen in keeping down the flat wheel expense.

Traffic congestion has also added considerably to control maintenance cost. The following of traffic necessitates throwing the controller drum on and off many more times than if the track were clear ahead. This throwing off of power is usually during the acceleration period or at slow speeds when the current is high and so the burning of contacts is increased. The braking of these high currents causes arcing at the contact tips and results in heavy renewals.

Fender expense is another item that has been increased considerably with street congestion. Frequently on our system it is found necessary to take off 50 or 60 bent fenders a day for repairs. This expense for fender repairs amounts to $15,000 a year. Another expense is that for keeping dash signs in condition. These are subject to considerable abuse and increased traffic congestion has made repairs necessary at more frequent intervals.

Street congestion also makes it necessary to clean cars at more frequent intervals. Daily cleaning is now done on our system at many points. The general cleaning consists of a thorough washing, both inside and out, at which time trucks and equipment underneath the car are sprayed with paint.

> *A car clean a day will keep the health officer away.*

Chart Shows Progress of Paint Shop Work

JUST how many cars are in the Waterbury paint shop of the Connecticut Company, what cars they are, and the length of time they have been there, can be told by a glance at a chart hanging on the wall of the office of W. S. Dixon, division master mechanic. For this purpose a large sheet of cross-section paper is used. Each vertical column represents a day, and each horizontal line a car. Series numbers of cars are listed at the left. When a car enters the paint shop a heavy red line is drawn across the column for that day, opposite the number of the car. This line is continued day by day as long as the car remains in the shop. When it leaves, the line is terminated. Bus painting is charted in the same way as car painting, on the same sheet. Notations are made to account for any unusual lapse of time while a vehicle is in the paint shop. When a number of weeks have passed and the lines on the chart have become distant from the car numbers at the left-hand edge, a new column is begun in the middle of the sheet. This chart not only shows

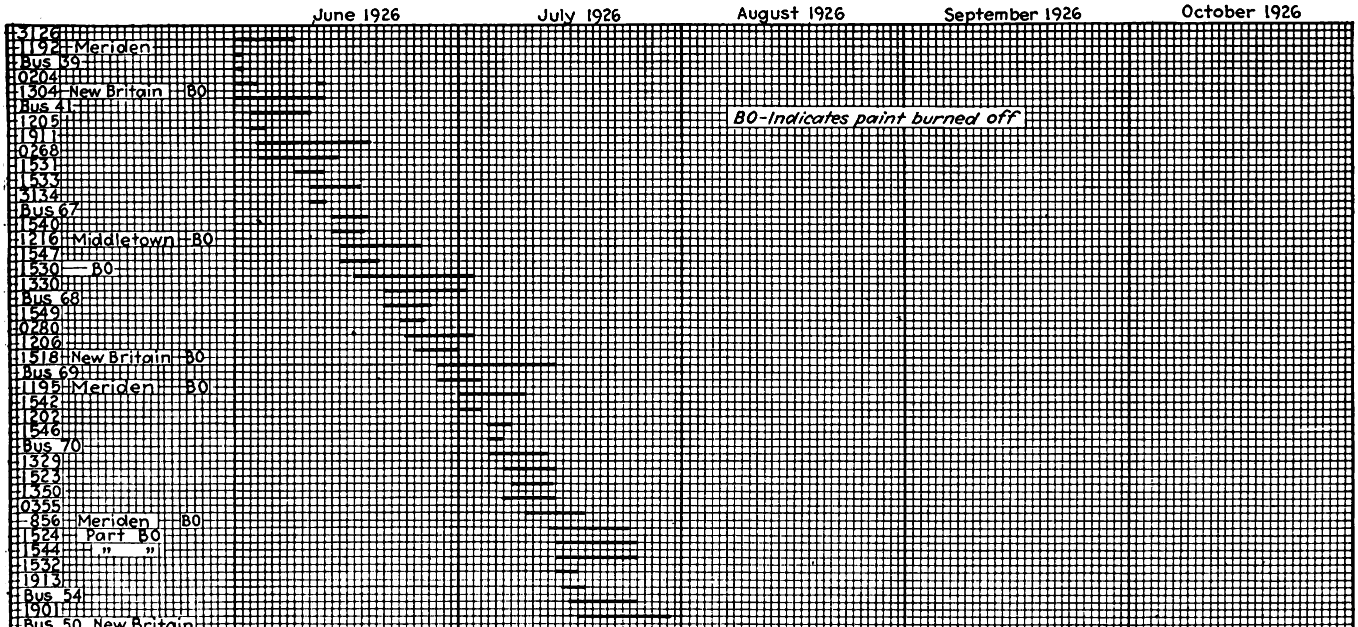


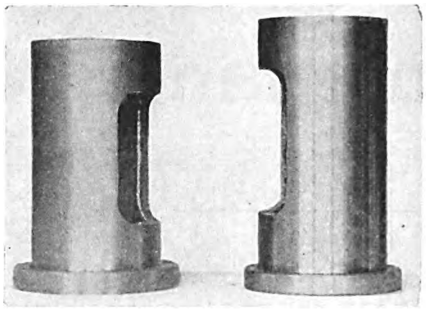
Chart showing day by day the cars and buses in the paint shop of the Connecticut Company at Waterbury existing conditions in the paint shop, but serves also as a permanent record of the work done.

Smooth Surfaces an Aid to Tight Bearings

By John S. Dean
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Quite commonly loose armature bearings in service turn and shut off the oil feed. Operators seem to depend entirely upon the keys or dowels to keep bearings from turning and do not give sufficient attention to the pressed fit that is desirable when a bearing is placed in its housing. There are a number of reasons why these bearings lose their fit in the housing, but the principal one is that a smooth-fitting surface is not provided when the bearings and housing are first machined for installation.

The importance of machining the outside of bearing shells and in the inside bore of the bearing seat in the housing so as to provide a fine, smooth finish cannot be emphasized too strongly. This is essential to get a tight fit of the bearing and to provide the proper initial allowance which will permit of frequent removal of the bearing shells for rebabbitting and reinstallation. With a smooth machined surface, a good metal-to-metal fit and a large contact area will be obtained.



Of two bronze bearings with $\frac{1}{16}$-in. lining of babbitt for a railway motor the one on the left with a poorly machined surface will not maintain a good fit, while that on the right with polished surface will remain tight in the shell

If the surfaces are left rough for the press fit the bearing shell may be tight when first assembled, but after it has been pressed out for repairs the high spots will be sheared or torn off and the allowance for press fit will be destroyed. Then when the bearing is replaced in its housing a loose bearing shell will result. The accompanying illustration shows two bearings. The one on the left has a rough finish and is an improper job of machining. The one on the right has a relatively fine finish with a smooth polish.

Experience with wheels and gears has shown that if the finished surface of the bore is machined smooth, when they are pressed on car axles no keys are needed to keep them from turning. In order to provide the smooth surface desirable many railways grind the gear and wheel seats in order to get a good tight dependable press fit.

It is the practice of manufacturers

An Opportunity to Serve and Profit

First Prize, $200 **Second Prize, $100**
Third Prize, $50 **Twelve Monthly Prizes, $25 each**

Enter the Electric Railway Journal contest at once. Send in as many of your maintenance ideas as you like. The Journal will pay $5 for each item published, whether it wins a prize or not.

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by Electric Railway Journal for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of Electric Railway Journal, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 each will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of Electric Railway Journal.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner each month will be made in the issue devoted to maintenance and construction, the third issue of each month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of Electric Railway Journal, to be published in September, 1927.

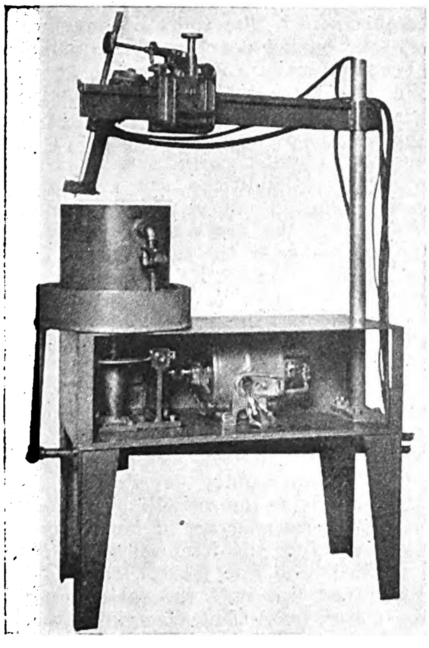
Maintenance men, here is your opportunity! The more items you send in the more chances you have of winning a capital or monthly prize. Get started at once. Articles published in the Maintenance and Construction Issue for May will have the first chance to win one of these prizes.

of modern railway motors to machine to a smooth finish the outside of bearing shells and the bores for the bearing seat in the housings. This practice should also be followed by the railways themselves for any work of this nature which they do, as it is essential to secure the maximum metal contact and so retain a good press fit in assembly.

New Equipment Available

Machine-Driven Arc Welder

RAPID extension of the field of usefulness of electric arc welding has induced manufacturers of this type of equipment to bring out many new and interesting welding machines. The accompanying illustration shows a new carbon arc welding machine built by the Lincoln Electric Company, Cleveland, Ohio, which is cooled by water circulating in tubs around the revolving table. The machine will weld circular seams with diameters up to 12 in. The piece on which the welding is done may be partially or totally immersed in water during the welding operation.



Carbon arc welder has cooling tubs around the welding work

The cooling arrangement used was developed to meet the requirements when welding high grade alloy steels on which the heat disturbance due to the welding must be reduced to a minimum. For 12 per cent manganese steel the welding may be done with the piece totally immersed in water and the arc submerged. This cooling arrangement is well adapted to the welding of manganese steel, since the rapid quenching of the molten metal gives it the physical properties expected in 12 per cent manganese steel. The frame and details of the machine are all made of welded steel.

Many Improvements in Small Milling Machine

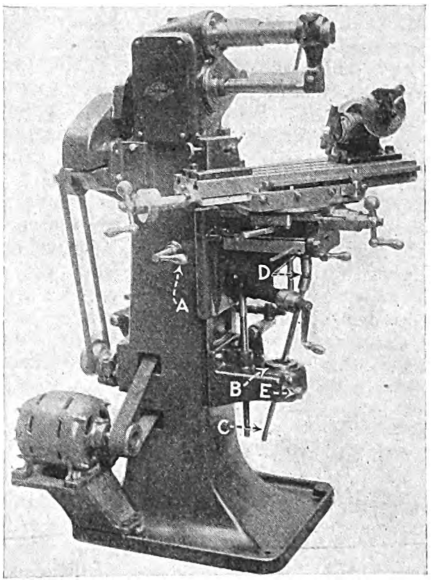
INCORPORATING many novel features, the Artisan Manufacturing Company, Cincinnati, Ohio, has recently placed on the market a small universal milling machine, with a table travel of 14 in., cross-travel of 5 in. and knee elevation of 11 in.

The machine, as shown in the illustration, has a self-contained countershaft mounted on the right-hand side provided with single friction pulley, which also serves as a brake. When belt-driven, power is transmitted directly to the friction pulley from the drive pulley on the line-shaft, and a ½-hp. motor is mounted on a housed bracket bolted to the friction clutch pulley. Handle *A* controls the friction and brake, thus enabling the operator instantly to start and stop the spindle from his regular position.

A three-step cone pulley carrying a 1¼-in. belt is attached to the countershaft and transmits its power to another cone pulley on a jackshaft which rotates more than twice as fast as the spindle. This jackshaft is offset from the spindle and runs in bronze bearings. Its speed produces a high drive-belt velocity and gives the spindle more than double the amount of torque obtained by mounting the pulley directly upon it. A sliding backgear, intermediate of the jackshaft and spindle, provides six spindle speeds.

The spindle has tapered bearings and the spindle nose is threaded. A feed gear in the rear end of the spindle operates through a reverse plate, thus providing power feed to the table in either direction. The reverse plate has gear changes which, with the three-step cone feed pulley, permit of six feeds. The feed belt drives a lower feed cone which is swung in a bracket for taking up belt slack. This lower feed cone drives shaft *E*, which passes through the column and carries a steel worm which engages worm-wheel *B*, through which passes feed shaft *C*. Feed shaft *C* is universally driven within worm-wheel *B* and the upper half of universal joint *D* and is provided with a snap socket so that it can be attached readily for driving either the table or the cross feed. The illustration shows the cross feed in use, and an adjustable dog on the bar seen just below the saddle automatically trips this feed in either direction. The saddle is square-gibbed with narrow guideways having a tapered gib for sidewise wear.

The table has a working surface of 6 in. x 18 in. and may be swiveled to a 45-deg. angle. The table feed shaft, seen directly back of *D*, receives power from it when attached, and an adjustable dog automatically disengages the table feed. The table feed screw is arranged to receive change gears for driving a dividing head in spiral milling, and self-locking micrometer dials, graduated in thousandths, are provided for table, saddle and knee adjustments.



No. 6 Artisan universal milling machine

The machine, without motor, weighs 650 lb. and is adapted to light toolroom work. The power cross feed makes it particularly valuable for jig boring. Regular equipment includes over-arm, ⅞ in. arbor, oil pot and necessary wrenches, but a complete line of extra attachments, such as dividing head; graduated swivel-base vise, oil pan, pump and piping, is obtainable at slight additional cost.

Association News & Discussions

Southwestern Association Meets in Historic New Orleans

President Sawyer and Managing Director Storrs of the American Association Tell How to Improve Conditions in the Electric Railway Industry

"TODAY is a different day in the electric railway industry," declared President W. H. Sawyer of the American Electric Railway Association, speaking before some 500 delegates and guests who braved threatening flood conditions to attend the joint convention of the Southwestern Public Service Association and the Southwestern Geographic Division, N.E.L.A., held at New Orleans, La., on April 26-29.

An appropriate setting for the story of today's electric railway situation was afforded by the South's picturesque Queen City, located within one of the very coils of the mighty Father of Waters, which is both the city's pride and terror. While the great river, gorged with the rainfall of 31 states, lashed at its confining levees and threatened to overwhelm man and his works, there was staged before the very eyes of the utility men a heroic struggle against the forces of destruction. Here, then, was an inspiring setting for a stirring call to action which was sounded by both President Sawyer and Managing Director Storrs in speaking before the assembled utilities regarding the electric railway industry's outlook.

CONDITIONS HAVE CHANGED, SAID PRESIDENT SAWYER

"Conditions of today are different from those under which we built and learned to operate electric railways," said President Sawyer. Under these conditions there is need for a different kind of men; for a different kind of thinking. The solution of our many problems requires experts—specialists. The methods of the past are no longer effective.

"But in the very difficulties of the job to be done lies the inspiration for us all. We have made some progress—are making progress, but we have only started. There is in the electric railway industry today an unlimited demand for skill and initiative. Are we doing the best job that can be done to meet today's changed conditions? Are we doing the best we know how to do? Are we taking advantage of the progress made by others and applying to our problems the methods which have already achieved improvement under like situations on other properties? Until we do all these things we are not doing today's electric railway job. That job requires the best that is in us. The very difficulties with which we contend afford us inspiration. In the solution of our baffling problems lies the greatest opportunity that was ever offered to the men of an industry.

"Hard luck stories have no place in the discussions of electric railway men. We make no progress in bemoaning the difficulties through which we have come or those which lie ahead. The day of consoling ourselves with hard luck stories has passed. With the coming of this new day our eyes are turned to the front and there is courage and hope in our hearts. Electric railway transportation has come through a fire of adversity which has tested the very core of the industry. Despite all of our difficulties; all of our burdens and all of the obstacles to progress which still lie in our path, one incontrovertible fact stands out above everything else. The very life and progress of modern communities depends on the provision of adequate and efficient public transportation. In the foundation-shaking test to which present transportation agencies have been subjected nothing has been found to take the place of the electrically propelled rail-borne car for moving masses of people rapidly and efficiently between their homes and their occupations.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 3-5—**United States Chamber of Commerce, annual meeting, Washington, D. C.**

May 6—**American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.**

May 9—**National Conference on City Planning, Washington, D. C.**

May 11-12—**Central Electric Railway Master Mechanics' Association, meeting, Webster Hall Hotel, Pittsburgh, Pa., 9 a.m.**

May 18-19—**Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.**

May 31—June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open Oct. 1 at noon.**

"Transportation is a vital community requirement. The roots of our industry are buried deep in the foundation of community prosperity and growth. We have cause to be proud of our jobs and have every reason for throwing our spirit and our energy into the work of keeping abreast with the march of progress. Conditions are changing—yes, changing, not yearly or monthly, but daily. We are public servants in the true sense of the term and by dedicating ourselves to the community's interest we aspire to that greatest of achievements—the service of mankind. The electric railway industry must and will go forward."

Utility men, power and light as well as railway, were urged by President Sawyer to take an interest in the electric railway situation because of its relation to community development and consequently to the growth of their own business. An abstract of Mr. Sawyer's address before the joint session will be published in a later issue.

In direct line with the same thought Mr. Storrs said that electric railways are becoming convinced that they cannot sell 1910 service in 1927.

"The success of the industry," he said, "depends on attracting enough additional revenue over the minimum which comes from necessity riding to put transportation on a profitable basis."

MODERNIZATION IN ALL LINES URGED BY MR. STORRS

Mr. Storrs joined with President Sawyer in urging modernization of equipment, methods and thought. He urged upon railway men their responsibility for taking the lead in the study and relief of traffic congestion. As the representative of 75 per cent of the people who use city streets he held that the transportation company must provide talent and initiative for joining with public and civic representatives in the relief of the serious situation brought about by growing traffic congestion. An abstract of Mr. Storrs' address before the joint session of the two associations will be published in a latter issue.

A tribute to the efficiency and spirit of co-operation displayed by the New Orleans Public Service Company was paid by Mayor A. J. O'Keefe of New Orleans in welcoming the utility men to the city. In responding, J. F. Owens said that the issue of the hour in American business is that of protecting private initiative by keeping government out of business. W. S. Vivian, Middle West Utilities Company, held that the Utilities should act in meeting the question of public ownership before it becomes an issue in the public mind. "After a subject of this kind becomes an issue," he pointed out, "there is a tendency to discredit what is said."

Activities of the two associations during the year were outlined by Harold E. Borton, president Southwestern Public Service Association, and H. B. Flowers, president Southwestern Division N.E.L.A. Mr. Flowers in his address also took occasion to emphasize the importance of refuting the theories of public ownership advocates and of adopting a vigorous policy of combating this threatened menace to the continued development of the Utility industry.

In the absence of Chairman W. H. Burke, Past-Chairman W. W. Holden, superintendent transportation lines, San Antonio, presided at the railway sectional meetings. The program was divided into general subjects of outstanding importance, each being covered by prepared discussions and comments from the floor. The subjects were as follows: "Telling the Transportation Story (a) To the Employee; (b) To the Public"; "Traffic Control"; "Modernization of City and Interurban Equipment." A supplementary report covering the discussion of these subjects will be published next week. A. B. Paterson, vice-president New Orleans Public Service Company, was elected chairman of the railway section for the ensuing year.

Meeting Postponed

DUE to the recent death of the president of the Pennsylvania Street Railway Association, Jilson J. Coleman, the executive committee has decided to postpone to a later date the annual meeting of the association which was planned to be held in Scranton the early part of May. The date of meeting will be decided at the next meeting of the executive committee.

H. L. Mitchell, president of the West Penn Railways, Pittsburgh, has been appointed president of the association to fill the unexpired term of Mr. Coleman.

Plans for U. S. Chamber of Commerce Meeting

FOLLOWING the usual plan, the fifteenth annual meeting of the Chamber of Commerce of the United States, to be held in Washington next week, will be divided into groups. Monday will be devoted to general sessions of the National Councilors. Tuesday there will be a general session beginning at 10 a.m. At 1 p.m. there will be a series of group luncheons with discussions on agriculture, civic development, finance, insurance and manufacturing. At 8:20 p.m. there will be a general session held jointly with the Third Pan-American Commercial Conference, at which the President of the United States will be the principal speaker.

Wednesday morning there will be a general session beginning at 9:40, devoted to business problems from the viewpoints of the various sections of the country. At 1 p.m. there will be a second set of group luncheon meetings, the topics being domestic distribution, foreign commerce, transportation and communication, and natural resources. The annual dinner will be held at 7:30 p.m. Secretary of Commerce Herbert Hoover will give the address.

Thursday morning at the concluding general session reports from the various sections will be presented, following which there will be the usual business of the session and election of officers for the ensuing year.

American Association News

Heavy Electric Traction

PROGRESS reports on the various assignments were considered at a meeting of the committee on heavy electric traction of the Engineering Association held in New York on April 28. Members present were H. F. Brown, chairman; A. H. Armstrong, J. M. Bosenbury, Morris Buck, W. L. Barclay, Jr., representing H. W. Cope, A. H. Daus, J. C. Davidson, J. H. Davis, E. P. Chase representing J. V. B. Duer, H. H. Febrey, J. O. Madison, M. W. Manz and L. S. Wells.

Standards will be reviewed by a subcommittee of which Mr. Wells is chairman. This will include catenary construction as distinguished from the lighter type used for trolley roads. It was agreed that Mr. Wells will confer with other committees also concerned in this work.

Considerable discussion occurred on the subject of track and third-rail bonds. It was proposed to send out a questionnaire to obtain information from which can be made a classification that may lead to a subsequent standard of bonds of this general type. Several suggestions were made regarding additional subjects for study by this subcommittee and it was agreed that these will be looked into for possible inclusion in the annual report.

An expression of opinion on the subject of the bibliography on heavy electric traction was considered. In a letter ballot the members were strongly in favor of obtaining the co-operation of the New York Public Library, which has made a proposal for the publication of the material without cost to the association. After considerable discussion it was voted to recommend to the executive committee that the library's proposition be accepted.

Mr. Armstrong reported for the subcommittee on branch line electrification. His sub-committee is obtaining material for a tabulation of costs of gas-electric rail cars and locomotives, which will be submitted at the next meeting of the committee.

A written report of the committee on train operation with articulated trains was presented by Mr. Daus. This shows information on the latest articulated units in the United States and abroad.

Information is being collected for the tabulation of electrified steam railroad mileage and electric locomotives by Mr. Cope's sub-committee, and it is planned to have the material in the hands of the members before the next meeting.

The next meeting of the committee is planned for the second week in June, the place to be decided on later.

Noise Reduction

SPECIAL Rolling Stock Committee No. 9 on reduction of noise in car operation held a meeting at Springfield, Mass., on April 14, 15 and 16. Reports as to future plans and progress were outlined and a test was made on the new Springfield car. Members present were H. S. Williams, chairman; C. Bethel, N. R. Brownyer, C. A. Burleson, F. L. Hinman, T. H. Minary and H. L. Rogers.

In connection with the development of the noise measuring apparatus, considerable time has been spent on development of the condenser type of sound pick-up. The construction and adjustment were of such minute proportions that the apparatus did not lend itself readily to portability. In order to overcome this it was decided to use a magnetic type of loud speaker for the pick-up. Difficulty was also experienced with the previous apparatus using the micro-ammeter and it was considered highly desirable to use a recording type instrument instead of an indicating type. The apparatus was changed to use a hook-up which permits the use of a recording voltmeter to register the amplitude of the sound vibrations.

Tests which were begun last year and considered tentatively in last year's report are to be run through to completion. It is expected that the final report will contain information on gear noise.

The committee discussed new developments which have been put forward towards the reduction of noise in car operation, the most comprehensive being the truck designs of the Springfield car and that used at Joliet, Ill. Other suggestions made were for noise reduction. These included carrying the entire motor weight on springs, use of rubber supports in which the rubber is vulcanized between two steel bushings, resilient steel wheels, development of a composition brakeshoe, bolting material to the web of wheels, and use of full elliptic springs with cast-on blocks instead of the bolted scroll ends.

The News of the Industry

Advance of 1½ Cents for Eastern Massachusetts Men

A new working agreement has been made between the public trustees and the employees of the Eastern Massachusetts Street Railway, Boston, Mass., effective on May 2 for one year, under which the employees are to receive 1½ cents an hour increase in the basic wage rate of 62½ cents.

The blue uniform men, on the other hand, agree not to ask for time and one-half for work performed on snow plows, which was awarded them last year by an arbitration board of which Judge John C. Leggat was chairman.

The 5-cent differential for one-man car operation remains the same. More than 95 per cent of the blue uniform work is performed on one-man cars.

Under the 1926 award, the blue uniform men receive 8½ hours pay for eight hours work, but now the company promises it will make as many straight eight-hour runs as practicable and reasonable and the men agree that they will operate them with no demand for pay for work not actually performed.

With the understanding that runs of eight hours and fifteen minutes will be kept down to a minimum, the men further agree to operate them without demand for time allowance.

Seniority rights for blue uniform men which continued for six months after layoff will be extended to one year. In all other essential respects the present contract is renewed.

The new agreement was reached after a series of conferences between the company's labor representative and the wage committee of the carmen's union, composed of William O. McGowan of Brockton, John F. O'Brien of Lawrence and Thomas J. Powers of Lowell and John H. Reardon of Worcester, chairman of the executive committee of the International Carmen's Union.

By referendum vote the negotiations have been approved by the local unions in Lowell, Lawrence, Haverhill, Salem, Lynn, Chelsea, Melrose, Woburn, Quincy, Weymouth, Brockton, Taunton and Fall River.

New Fare Scheduled for Kansas City

William G. Woolfolk, president of the Kansas City Public Service Company, Kansas City, Mo., on April 18 filed with the Public Service Commission application for authority to rearrange the schedule of fares charged by the railway in Kansas City, to make the schedule conform to promises in connection with the new franchise. The application asks that the commissioner authorize the new schedule so that it will become effective May 1.

The present schedule is 8 cents cash fare, two tickets for 15 cents, seven for 35 cents, with one-half of these rates for children between the ages of eight and twelve and children less than eight years old free. The new schedule as provided in the ordinance is a single cash fare for adults of 8 cents, two tickets for 15 cents, ten tickets for 70 cents or fifteen tickets for $1; children less than eight years old, free; between the ages of eight to twelve years old, 4 cents for single fares; four tickets for 15 cents; ten tickets for 35 cents and thirty tickets for $1, with two children without tickets to be carried at the price of one single cash fare for an adult.

Survey of Transportation Situation in Chicago

Prospects of Immediate Consolidation of Chicago Transit Systems Denied by Company Officials—Effect of Home Rule and Terminable Permit Uncertain

RUMORS current in the local press on April 25 that agreements had been reached between the new city administration in Chicago and local traction officials for immediate consolidation of the surface, elevated and bus lines on the basis of indeterminate franchises were later denied.

Leonard A. Busby, the Chicago City Railway president, asserted that "we have no oral agreement or understanding of any kind with any one regarding a settlement of the traction question." He said:

> We are in favor of a unification of these properties and enabling legislation which will authorize the city to grant a modern type of franchise to permit a consolidation, but so far as I know no attempt to draft or submit legislation of this kind has been made at the present session of the State Legislature.

The steady rise in prices of traction securities since the election of Mayor Thompson is probably responsible for the circulation of these misleading reports, city and company officials believe. A recent tabulation of market prices reveals that first mortgage bonds of the Chicago City Railway which sold on Feb. 1, the date of franchise expiration, at 76, and on April 6, the day after election, at 78½, are now selling at 85. Chicago Railways series A bonds in the same period have gained nearly seventeen points, or from 53¼ to 70.

Mayor Said to Desire Quick Settlement

Evidence that the new Mayor desires a quick settlement of the problem is found in his campaign addresses and subsequent statements. Although his advocacy of home rule is quite well known, at no time since the recent mayoralty contest was begun has he announced any definite or constructive transit program. In his inaugural address on April 11 the Mayor merely reiterated his campaign pledge to give his very best thought to the matter and intimated he would have something further to say in a later communication to the City Council.

In the meantime, however, the McCluggage and Durso bills, the former providing for the return of utility control from the state commission to all Illinois cities over a certain population and the other for local control in the city of Chicago, have been sent to a subcommittee by the General Assembly at Springfield after discussions lasting several months. The measures were vigorously opposed by representatives of the steam railroads and public utility companies of the state. The shelving of the two bills undoubtedly means that no further action will be taken in the matter during the present session of the Legislature. Defeat of Mayor Dever, who was a leader in the fight for home rule, and the failure of Chicago voters to approve the home rule proposition, together with the natural assumption that the new Mayor was unfavorable to home rule, are said to be the reason for the Legislature's sudden decision to sidetrack the bills.

Concern over the outcome of the Chicago mayoralty election, as in the case of the home rule bills, is also reported to have been responsible for the long delay in the presentation of a terminable permit bill in the Legislature at Springfield. The committee appointed to investigate the subject of indeterminate permits made its report to the Senate several months ago after an extensive junketing trip. The report declared that sentiment for such a policy was distinctly favorable wherever it had been tried out. Several members of the committee from the House of Representatives, however, declined to sign the report.

Inasmuch as home rule and the terminable permit legislation were regarded as the very essence of the negotiations for a successful traction settlement at the time the matter was dropped by the local transportation committee of the City Council last February, doubt is now being expressed as to the course of action the City Council will take. At the present time the city has no power to issue a terminable permit to the surface lines or bus lines, and power to consolidate these lines, together with the elevated lines, into a single vast system and to bring them under local regulation must also be obtained from the Legislature. The various plans which are still pending before the transportation committee are (1) the Lisman plan, sponsored by F. J. Lisman and associated New York banking interests, involving the Chicago Surface Lines and based on a twenty-year grant; (2) the consolidation plan, advocated by the former Mayor and providing for a consolidation of surface and elevated lines on the basis of a terminable permit and home rule, and (3) the proposal made by the Chicago Motor Coach Company, which provides for substitution of buses for street cars in exclusive city-wide service. The two first plans are now in the form of tentative ordinances. At the last meeting held by the committee the companies were asked to agree among themselves on a plan of merger or working agreement with unified service and universal transfers.

While the city is awaiting action by the new Mayor and the local transportation committee, which is again headed by Joseph B. McDonough, the original Dever appointee, the date of expiration of the six months extension of Chicago Surface Lines franchises draws rapidly onward. Only a little more than twelve weeks remains for them to run. If no agreement is reached or ordinance passed before the extension lapses, on July 31, there will arise the question of valuations and many other important matters.

At the present time Samuel Ettelson, newly appointed Corporation Counsel, is making a study of the various traction plans, including subway construction projects, the result of which will be submitted to the Mayor on his return from New Orleans next week.

St. Louis Resists Higher Fares

That the operating costs of the United Railways, upon which is based the petition for a straight 8-cent fare in St. Louis, will be materially lowered when the system emerges from receivership and the properties return to private management is contended by the city, which is resisting before the Missouri Public Service Commission Receiver Wells' latest application for higher fares. The city's protest against the higher fare was filed with the commission by City Counselor Muench on April 22. The petition of the city points out that the United States Court has ordered the sale of the company's properties on May 25.

Receiver Wells also seeks to have the valuation for rate making increased from $51,781,348 to $75,000,000 and claims that an 8 per cent return should be permitted. The present income permits only a 3.3 per cent return on the $75,000,000 and only 4.27 per cent on the $51,781,348 valuation. The city is also opposed to the $75,000,000 valuation. It contends also that the city car riders should not be forced to carry the burden for unprofitable operations in St. Louis County; that the annual depreciation charge of $1,500,000 is excessive by at least $300,000, and that the insurance reserve set up by the company is unduly burdensome.

Change in Control Said to Impend in Oakland

Change in the control of the Key System Transit Company, Oakland, Cal., looms as the result of the election of two new directors at a meeting held on April 22. The new directors are A. J. Lundberg and Gustav Epstein. They replaced A. Crawford Greene and B. H. Dibblee, elected at the annual meeting a month ago.

Messrs Lundberg and Epstein are members of the investment firm of J. Barth & Company, large stockholders of the Key System. Barth & Company were unrepresented on the board up to last November, when H. C. Clayburg was elected a director. It is hinted that the members of this concern will now play a prominent part in guiding the financial destinies of the railroad. The size of the executive committee has been increased from five to seven members so as to include Messrs Clayburg and Lundberg.

Stock of the Key System has been declining steadily in the market during the last year, especially the prior preferred and the preferred. Moreover, the quarterly dividend on prior preferred has been passed. In announcing the decision of the directors to skip this dividend President Lester S. Ready stated:

> It has been the aim and hope of directors and the management that this would not be necessary, but the conditions that have developed during the past year have convinced them that the best interests of the company and of the stockholders will be served if this action is taken.

Mr. Ready cited as factors in the present financial status of the company the $400,000 annual increase in operation expenses through the higher wage award made by the arbitration committee a year ago; the expenditure of $6,000,000 for capital additions and betterments in 1925 and 1926 and the failure of the new revenue provided through an increase in railway and trans-bay ferry rates to meet the higher operating expenses and cost of improvements. In a statement made by him Mr. Ready said:

> It was contemplated that following the increase in rates some loss of passengers would result, but it was expected that within a few months the traffic would recover, especially in view of the added track facilities and improvements in track and equipment.
>
> To date the passenger traffic, due to material increase in ownership and use of automobiles, has not increased to an extent to offset the added costs. In addition a temporary depression of gross revenue has occurred during the first three months of 1927, owing to the more than normal rainfall.

Rumors are rife in San Francisco that the Hill interests are maneuvering to get control of the Key System as part of their transcontinental system and make their terminal in the Key mole. These reports, however, are contradicted by statements that the Key and the Southern Pacific are shortly to merge so as to eliminate present costly duplication of service.

Surveys with this object made by engineers are now being studied by the officials of both roads. An announcement centering around the Key and Southern Pacific lines seems certain in the near future.

In the meantime the Key officials are making plans for formal application for a higher fare. Hearing on this matter will come up before the Railroad Commission on May 10. At this hearing it is likely that there will be a hot fight, as John L. Davie, Oakland Mayor, who is none too friendly to the Key System, has just been re-elected for another four-year term, defeating Frank Colbourn. The latter was a member of the arbitration committee that awarded the car men of the Key System a higher wage in 1925.

Traction Settlement Looms Again in Toledo

Action looking toward a settlement of the railway difficulties in Toledo, Ohio, may be sought before the voters at the primary election in August. Demand to this end has been made in conferences between officials of the Community Traction Company and representatives of the city administration. Recent discussion indicates that action must be taken on the contention of the Street Railway Board of Control that between $2,000,000 and $3,000,000 must be written off the capital value of the company to take care of abandonments, obsolescence and correct some of the evils in valuation adopted under the Milner plan. Concessions in the way of power rates are to be asked in return for a monopoly of bus and railway service. Following the Riggs survey two years ago an effort was continued to draft a new franchise keeping the salient factors of the Milner plan but correcting many of its defects brought to light in six years of operation.

The result of these negotiations between attorneys from the New York office of Henry L. Doherty & Company and the city law director was unfavorable to the Board of Street Railway Control, which has had direct contact with the operations during the entire life of the Milner franchise ordinance. Since this stand was taken negotiations have been intermittent, with conditions getting worse.

The city has a program of about $3,500,000 of new paving and reconstruction of streets which involves the traction company at several points. The Board of Control has asked for revision of power rates, new bus lines and extensions, and in the meantime the company has continued to lose business to private automobiles and competing independent bus lines.

After weeks of effort to arrive at a decision Service Director William B. Guitteau has had legislation introduced in the City Council providing for the repaving of St. Clair Street in the downtown district by the city if the railway refuses to go ahead with the work inside of 60 days. Abandonment of this stretch of track was recommended as a part of the Riggs plan, but J. Frank Johnson, general manager, says the abandonment can come only as a part of the general plan.

Before the City Council are three or four plans for complete bus service for the city and it is believed that they constitute one way out of the tangle in the event the railway situation is not brought to a settlement in a few months.

Wiring Havoc in New York Subway

Fire broke out on the afternoon of Sunday, April 17, in the new subway under construction by the city of New York under Eighth Avenue. The fire started at 36th Street, damaged cables and subway construction to an extent estimated by the builders at $500,000 and almost completely stopped telephone and light and power service in a large section of the mid-town business area. Police and fire signals were put out of commission, and grave hazards faced the firemen who poured water into the excavation.

Fire in the Eighth Avenue subway gave New York firemen a hard fight

For three hours or more several large hotels were deprived of utility service, newspaper offices were hampered, at least one hospital was without electricity, and trolley service was somewhat crippled. Despite the fact that it was Easter Sunday, wiremen and other utility workmen were recruited from the forces of the telephone and light and power companies from all over the city and contiguous territory to repair damage and restore service, and the torn-up and undermined streets beneath which the new subway is to run showed even more sub-surface activity than on weekdays.

On Monday morning the fire broke out again with even worse results than the day before, paralyzing 15,000 telephones, darkening tens of thousands of electric light bulbs and stopping elevators throughout the district between 34th and 38th Streets and Seventh and Ninth Avenues. The disruption of telephone, light and power service halted business activities in the district almost as completely as if that zone had been visited by an extensive disaster. All electric power was cut off from a twelve-story department store covering most of a city block. Many business places shut down for the day or closed early, and it was estimated that twenty thousand workers were forced to be idle. In the section affected is housed a large part of the garment industry of the city. When night fell residents in side streets had to resort to oil lamps and candles and watchmen of loft buildings carried lanterns and flashlamps.

The New York Edison Company made final connections of feeder cables sufficient to carry full-capacity load of 100,000 kw. late on Tuesday evening, and when the business buildings were opened on Wednesday morning there was energy for elevators and electric lights in all establishments, but many buildings were still cut off from telephone communication.

New Franchise Sought in Sandusky

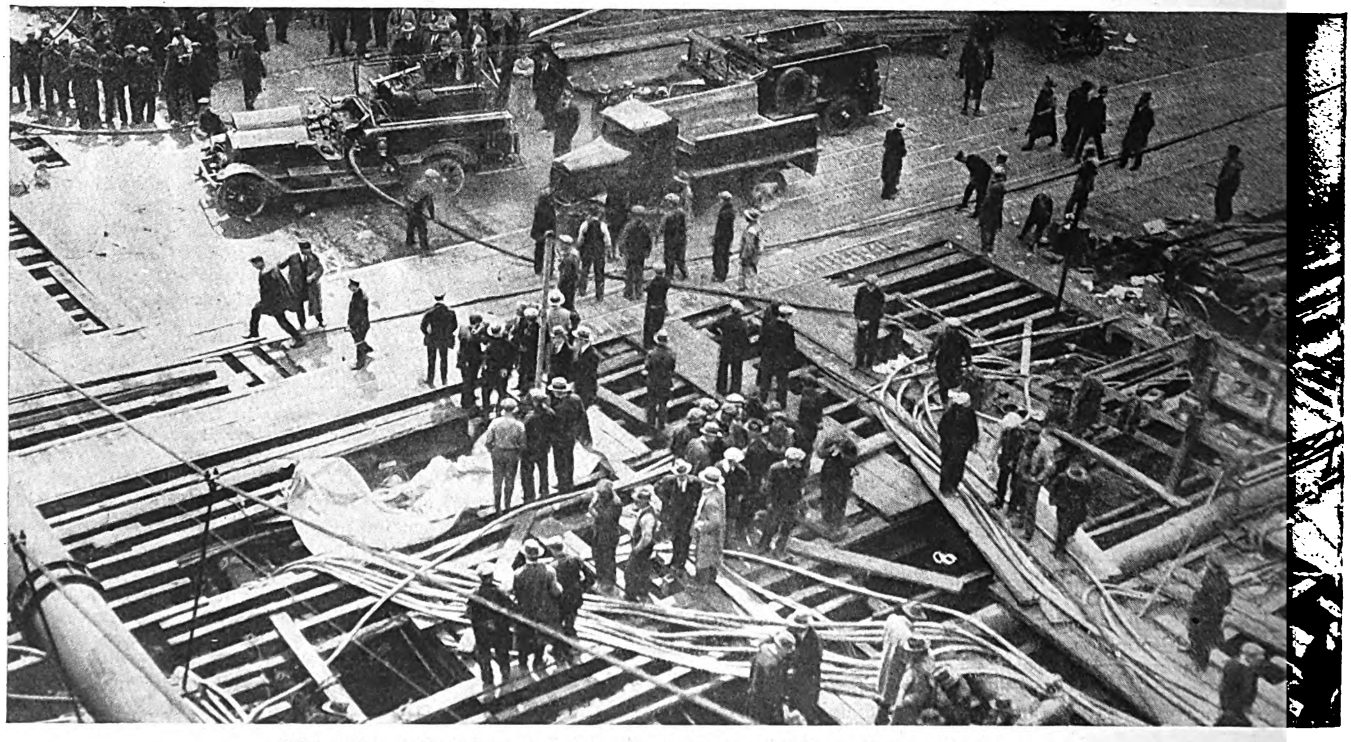
A franchise to take the place of the one that expired nearly a year ago was submitted to the City Commission of Sandusky, Ohio, on April 18 by F. W. Coen, president, and L. K. Burge, vice-president and general manager of the Lake Shore Electric Railway. The draft was discussed behind closed doors and its provisions were withheld. It is understood, however, that it makes provision for a fare higher than 5 cents.

"Making Transportation Pay"

"Making Transportation Pay" is the title that has been chosen this year for the digest of the presentations made by electric railways in 1926 for the Charles A. Coffin prize. This title was selected because it epitomizes the present trend of managerial thinking. The book shows that transportation is being made to pay and how it is being done.

Complimentary copies are being sent to a selected list, including public utility commissions, investment bankers and public and college libraries, as well as members of other organizations interested in the electric railway industry. A limited number of extra copies of the book are available to others at the cost price of $2.

This is the fourth volume of the series of "Electric Railway Practices" issued since the establishment of the award by the Charles A. Coffin Foundation.


This view of the second fire shows great patches of planking torn up and temporary electric cables installed

Transportation Tied Up in Peterboro

Peterboro, Ont., is being supplied with transportation service by a local cartage company. The Peterboro Radial Railway, operated by the Hydro-Electric Power Commission of Ontario, has been closed since March 31. The city and the commission were unable to come to terms on a price for the utilities. The commission placed a price of $575,000 on the gas and railway utilities and the City Council countered with an offer of $150,000. It is desirable to sell the railway, the commission declared, because it is losing $50,000 a year, an amount borne by all hydro municipalities in the Central Ontario System. The railway is valued at $475,000, and if it is junked, which to some seems probable, this loss will have to be absorbed by the other hydro municipalities in the system.

Meanwhile the city is handicapped by lack of transportation and a further difficulty was encountered when the Mayor announced that the Hydro commission's contract with the Gotfredson Bus Corporation did not expire until May 20.

Bill Against One-Man Cars Lost in Tennessee

One-man cars are to continue to operate in the cities of Tennessee due to the action of the House of Representatives in rejecting the bill offered by various delegations of the larger cities which would have prohibited their usage in all cities of 30,000 population or over. The Knoxville delegation, backed by the smaller counties, opposed the bill and in rejecting an amendment to permit the cars in all towns under 30,000 population brought about the defeat of the bill.

Summer Excursion Rates Announced by South Shore

Anticipating a large volume of summer travel to Indiana Dunes State Park, newly created reservation, the Chicago, South Shore & South Bend Railroad will provide low week-end rates from Chicago. The round trip rate to Tremont, park gateway, will be $2; to Miller, $1.50, and to Wilson, $1.75, the two latter places also being popular with summer visitors to the Dunes. The tickets sold on this basis will have a return limit three days following date of sale. The South Shore Line is the only line providing regular service to these Dunes points.

Tract on Courtesy Bristles with Interest

"Our Part in Public Service" is the title of a handsome vest pocket booklet on public relations issued by the Nashville Railway & Light Company, Nashville, Tenn.

The booklet has been distributed to 1,400 employees. It covers every phase of public relations work, both in the operating and electric accessories field. In a modest preface, J. P. W. Brown, vice-president, explains that while the principles set forth are not new, having been discussed in employee group meetings, nevertheless they are essential to the company's success.

The text matter of the little code of principles bristles with interest and attacks many new phases of contacting with the public. Of outstanding significance are the paragraphs devoted to definition of courtesy, telephone speech and the opportunities for public service.

News Notes

Interurban Lowers Wages.—A reduction of 10 per cent in wages of all officials and employees of the Buffalo & Erie Railway has been ordered, effective May 1. This company operates an interurban between Buffalo, N. Y., and Erie, Pa.

Adjustment Department Formed.—A new department of the Kansas City Public Service Company, Kansas City, Mo., has been formed. It is known as the adjusting department. It replaces the old claim department of the company. The new department is under the supervision of Arthur T. Bagley, who will be superintendent of personnel and manager of this department for the company.

Reprints of Interview. — "Three Classes of Service," which appeared in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 26, 1927, has been reprinted in pamphlet form. The number now in circulation is 85,000. The article was an interview by Charles Gordon, editor of the ELECTRIC RAILWAY JOURNAL, with T. E. Mitten.

Seeks Ten-Cent Fare. — A petition was presented recently to the City Council of Ames, Iowa, by the Fort Dodge, Des Moines & Southern Railway calling for a 10-cent fare on cars and buses operating between the loop district and Iowa State College.

Would Provide Study of Transit Needs.—A bill to create a special commission to study the city's transportation needs, particularly a rapid transit system, will be presented at once to the new St. Louis, Mo., Board of Aldermen. Samuel L. Wimer, chairman of the special committee on rapid transit of the old board, will be sponsor for the new measure.

Official Credited with Idea.—The rebate slip for passengers who inadvertently or accidentally drop more change than is necessary in the Johnson fare boxes is being used effectively on the lines of the Southern Colorado Power Company in Pueblo, Col. The details of the idea, reference to which was made in the ELECTRIC RAILWAY JOURNAL, issue of April 9, 1927, page 669, were worked up and carried out by W. C. Porter, superintendent of transportation.

Facts on One-Man Car Operation.—The Toronto Transportation Commission, Toronto, Ont., has recently published in the daily newspapers a series of announcements presenting data on the one-man cars. Publishing such information is in line with the practice of the commission of taking the public into its confidence in all important developments in regard to the system. The purpose of the announcement was to correct any false impression and to win the public over to use the rear exits of the "treadle" cars and otherwise co-operate with the operators by using the car so that the service they provide might be convenient and efficient.

One-Man Car Service Extended.—Cars on all the lines of the Valley Railways, Harrisburg, Pa., are run now on the one-man basis, following the extension to two lines on April 18, and part of a third line which formerly had two-man operation.

Would Elect and Not Appoint Members.—A bill has been introduced in the Wisconsin Assembly providing for the election of Railroad Commission members instead of their appointment by the Governor, as is the case now. The bill states that at the general election on April 1, 1928, the voters shall determine by referendum whether or not Railroad Commission members shall be elected by the people.

Seeks Ten-Cent Rate on New Line.—The Public Service Railway will provide bus service for the lower east side of Union City between Hoboken and Grantwood, N. J., if the City Council of Hoboken agrees to a 10-cent fare for the run up the viaduct the same as on the Hillside line. This is the claim of W. H. Shepherd, divisional manager of the company, at a conference on the transportation situation at the committee of the whole session at City Hall on April 18. The proposed extension of the Hillside Line would mean the rerouting of buses of some of the present fleets. The willingness of the company to expand its service was disclosed by Mr. Shepherd. He referred to his going to that section a year ago and of an increase of 7,500 miles in daily mileage under his direction and of intention to continue that policy within reason as a means of increasing revenue for his company.

Foreign News

Austrian Electric Line Completed.—Service has commenced between Woral and Innsbrück, Austria. This line, 45 miles long, is a section of the Austrian State Railroad and is part of the line included in the electrification program which has recently been completed on this system.

New Swiss Electric Locomotives.—The first of a new and improved type of electric locomotive has lately been turned out from the Brown-Boveri works at Munchenstein, Switzerland, for service in hauling the heavy express trains between Berne and Zurich. The engine, which runs on seven pairs of wheels and weighs 115 tons, is said to have attained a speed of more than 62 m.p.m.

Flood Lighting at London Stations—According to the London Underground Railways, the experiment of flooding the stations with light is proving successful at the City and South London

Railway extension and will be introduced at the Finsbury Park station of the Great Northern, Piccadilly & Brompton Railway. Powerful searchlights are placed also on the roofs of the outdoor stations to emphasize their position.

Railroad Electrification in Holland.—Electric trains will soon begin to run from Haarlem to Rotterdam and Haarlem to Ymuiden in Holland. By next October it is expected that the Amsterdam-Rotterdam line will be completed.

London County Council Re-equips Cars.—Fifty cars in London have been re-equipped with upholstered cross seats. Operation of these cars has proved so successful that the London County Council will extend the program to 50 more cars. About 250 cars are in line to be improved. Total cost for the work will be £54,000.

London Underground Railways to Use One Guard on Trains.—All trains operating in the London Underground Railways will in the future have only one guard to a train. This system has been used on four and six-car trains only in the past, but according to recent official news of the Underground more men will be added to the staff to direct the traffic, and automatic devices will be substituted in place of guards. Experiment is now being made of a telephone to be used for communication between the motorman and the guard. This change of system is a process which will take at least two or three years to carry out, the time allowed for equipping all of the cars.

Tramways Association Meet at Bath.—Bath, England, is the meeting place chosen for the annual conference of the Tramways & Light Railways Association to be held June 30 and July 1.

Express Buses for Manchester.—Manchester Corporation Tramways department has started experimental express bus service to parallel each of the tramway routes. Fares on these buses, however, are twice those charged on the tramway lines, but the buses do not stop between the tramway fare zone points, which are about ¾ mile apart. The service will be linked up so that beyond the range of the tramways the buses will stop at all intermediate points and ordinary fares will be charged.

Glasgow's Plans for New and Improved Cars.—Purchase of 50 new cars and the improvement of 150 cars now in service were recommended by the Glasgow Town Council, and approved on April 14. The cost is estimated at £345,000. For twenty years Glasgow has made little change in car design. In the report submitted by L. Mackinnon, general manager of the Glasgow Corporation Tramways department, it was stated that the speeding up of the service in Glasgow had emphasized the necessity for bringing the cars up to date by the introduction of modern motors to give increased acceleration and retardation and higher running speeds. At the present time, according to the report, there are 1,004 Glasgow built cars in stock, including 332 constructed less than seventeen years ago, 235 built between seventeen and 22 years ago and 437 more than 22 years ago.

Recent Bus Developments

Right of Philadelphia to Tax Interstate Buses Upheld

The fight of the city of Philadelphia, Pa., for local jurisdiction over interstate buses has been carried to a successful conclusion in the United States District Court by James F. Ryan, Assistant City Solicitor.

The American Transit Company and the American Motor Coach System, both Delaware corporations, with local offices in Philadelphia, had obtained a temporary restraining order preventing the city from collecting the $50 fee per bus authorized by Council. P.R.T. buses, local and interstate, all pay that fee.

The city, contending that the aggregate annual collection of $12,500 for the 250 buses engaged in interstate traffic would scarcely meet the expenses of proper regulation in the public interest, went before the court in an endeavor to make a test case of the operators' action.

Judge Thompson dismissed the injunction. In ruling in favor of the city, he pointed out that the bus was a new factor in transportation. He cited increased population, narrow streets, and the occupation of roadways by buses of more than ordinary weight and size as a modern problem. These buses, he said, carrying as many passengers as possible, would become a menace to the city unless properly regulated. The court said:

> It is essential to the orderly supervision of traffic, that the route, stop, start and loading points of these interstate buses should be clearly designated. Each bus also should bear a city license plate. The designation should be filed for immediate reference in an appropriate office.
>
> A $50 fee for each bus is certainly not unreasonable, in view of the testimony from two companies that monthly receipts for twelve buses averaged between $18,000 and $20,000.

The court pointed out that Congress had not yet dealt with the interstate motor vehicles in Philadelphia, and while it might do so in the future, it was now within the province of the states to provide reasonable police regulation.

As a result of the decision abolition is likely to follow of all existing ordinances regulating passenger-carrying motor vehicles in Philadelphia and enactment by Council of a new measure providing complete police jurisdiction over interstate as well as local buses will be effected shortly.

More Bus Substitutions in Massachusetts

The Selectmen of Ware, Mass., have granted a permit to the Conlin Bus Lines, Worcester, to connect Enfield, Ware and West Brookfield by bus. At the latter point the buses will connect for Worcester and Boston. There will be summer and winter service. The State Department of Public Utilities is expected to approve the plan so that service can start on May 1. The matter of granting a permit to the Springfield Street Railway to operate buses between Ware and Palmer was discussed by the Selectmen and it was decided to propose to the railway that it take up the rails in Ware but leave the ties in place. If the proposition is acted upon favorably by the railway the bus permit will be granted.

Prospective Bus Line to Be Under Hamburg Railway Management

Petition has been made to the New York Public Service Commission by William D. Allen for the operation of a bus line between Orchard Park and Lafayette Square in Buffalo traversing Buffalo, East and West Quaker Streets in Orchard Park, Orchard Road in East Hamburg, Orchard Park Road and Potter Road in West Seneca to the intersection with Orchard Park Road at the Buffalo City Line. The petition states that it is ultimately planned to form a corporation for the running of the bus line, the management to be the same as that of the receiver of the Hamburg Railway. As soon as the Ridge Road is opened across the railroad east of the Lackawanna city line it is proposed to secure permission to operate buses in alternate trips over the Ridge Road to South Park Avenue and to co-ordinate this line with the service given by the Hamburg Railway. Three large railway bondholders have agreed to take sufficient stock adequate to finance the operation of the new line.

Southern Pacific Supplements Service with Bus Auxiliary

Entering the highway motor transport field for the first time, the Southern Pacific Company on April 19 filed with the Secretary of State at Sacramento articles of incorporation of the Southern Pacific Motor Transport Company, a California corporation, to operate as an auxiliary to the railroad activities. San Francisco is named in the articles as the business center of the proposed new corporation and the purpose of the organization is outlined as being "to own, hold, control, lease, purchase, sell, operate and manage motor stages and motor trucks in streets and highways, public or private, within and without the State of California."

Speaking of the action of the company, Paul Shoup, executive vice-president of the Southern Pacific, said that the competition of privately owned machines and of bus companies in connection with the construction of good highways in the territory served had so decreased the earnings from certain trains, especially those engaged in branch-line service, as to necessitate taking off these trains. The Southern Pacific Motor Transport Company has been organized as a separate corporation with independent operation. This service will be developed as the need arises. The company will be empowered to engage in all forms of transportation.

Would Operate Buses in Batavia

Batavia is soon to be added to the list of smaller up-state New York cities supplanting trolleys with buses. The Batavia Traction Company at a meeting of the Common Council asked permission to operate buses and discontinue its trolley system, which has served the city since 1901. The Council held the matter in abeyance pending investigation, although it is a foregone conclusion that the days of the street railway are numbered.

If the Council grants the request immediate application will be made to the State Public Service Commission for permission to make the change. Stephen W. Brown, president of the corporation, and other representatives of the railway stated that the company could no longer stand the drain on its finances in keeping the railway line in operation. The equipment consists of only four cars. Mr. Brown said that the company had lost more than $60,000 in thirteen years. It was stated that there were no funds in the utility's treasury even for current expenses and that a bus system was the only solution.

While city officials and public sentiment generally are favorable to the shift, the question of fare is to be threshed out. The present fare is 5 cents. There is some sentiment for municipal bus operation, but it is expected that the Batavia Traction Company will continue to be the city's transit agency, but with buses instead of trolleys.

Bus Bill Signed by Pennsylvania Governor

Governor Fisher of Pennsylvania on April 18 signed the Parkinson Senate bill which permits any electric railway incorporated heretofore under the laws of Pennsylvania and owning at least two-thirds of the capital stock of any motor company or street railway now or hereinafter organized under the laws of the state to acquire the latter. Acquisition must be subject to the approval of the Public Service Commission.

Bus a Vital Co-ordinating Factor in Detroit's Transportation

The most practical and proved panacea for the traffic and transportation ills that are at present the most pronounced growing pains of the city of Detroit is the bus. In voicing this opinion Del A. Smith, general manager of the Department of Street Railways, claims that the bus is a vital adjunct to the electric railway system. He says engineering skill has accomplished no greater or prouder task than in bringing the bus to its present high state of development.

In the Detroit *Times* of April 5 Mr. Smith outlines the phenomenal growth of the bus in general and particularly in the locality of Detroit. The department established 116 miles of bus routes in June, 1925, and is now operating more than 160 route-miles employing 310 buses for these routes. In this great wave of modernism and improvement Mr. Smith believes that the department should go slow in stocking itself with equipment that may be impractical and obsolete tomorrow. He is watching closely experiments in other cities, both in the matter of developing the bus and in meeting the competition from independent lines. Mr. Smith favors the Mayor's plan of some day taking over the Detroit Motor Bus Company's routes and equipment. He said that would be the fairest and most practical plan, but any harsh or summary action in that direction would not be fair to stockholders or in accord with the original agreement with the private company.

Discontinuance Application Dismissed.—The California Railroad Commission has dismissed the application of the Pacific Electric Railway for permission to discontinue a portion of its Upland-San Antonio Heights motor coach line between 24th Street and San Antonio Heights, upon request of that company.

Seeks to Operate Bus Line.—Authority to operate a bus line between Ogden, Utah, and the Utah-Idaho state line is asked by the Utah-Idaho Central Railroad in a petition recently filed with the Public Utilities Commission. The contemplated service would cover both freight and passengers. According to its petition the company would continue its rail service and would operate its bus lines in addition to this equipment, if granted a certificate of convenience and necessity.

Abandons Bus Route.—The bus route of the Worcester Consolidated Street Railway, Worcester, Mass., over Burditt Hill, Clinton and through West Boylston has been abandoned. Instead of this two-hour service by that route the Consolidated is running buses hourly through Boylston Center. The company gives as a reason for the abandonment of the line that better time can be made on the new route, which is 3 miles shorter, and there is not sufficient riding on the Burditt Hill route.

Bus Charter Granted.—A certificate has been granted by the California Railroad Commission to the Los Angeles Railway to operate motor coach service between Seventh and Los Angeles Streets, in the city of Los Angeles, and the intersection of Whittier Boulevard and Simmons Avenue.

Petition Shows Railway-Bus Agreement.—The Jamestown-Dunkirk Transit Company, Inc., has petitioned the New York Public Service Commission for an amendment to its certificate for a bus line in Dunkirk to permit it to change the route over which the line operates. With the petition there is filed a copy of the resolution of the Common Council of Dunkirk, wherein it is shown that an operating agreement has been made between the transit company and the Buffalo & Erie Railway as to the operation of buses and cars in the city. This agreement has been approved by the civic authorities.

Ruling Reduces Speed of Buses.—The Board of Public Service of St. Louis, Mo., on April 6 decided to limit the speed of buses operated on Waterman Avenue between Union and Skinker Boulevards at 15 m.p.h. The former limit was 25 m.p.h. The ruling was the result of numerous protests from certain residents who had contended that the double-deck, solid-tired buses operated by the People's Motorbus Company were shaking their houses and causing damage to the property.

Buses for Week-End Rushes.—Eight bus runs from Framingham to Boston, Mass., have been eliminated on the Boston & Worcester Street Railway, but three additional railway runs have been placed in operation over the same route. This practically amounts to hourly service between the two points. The buses are being held in reserve for week-end rush runs and other special occasions.

Buses in Oswego.—Territory never before reached was opened up at Oswego, N. Y., on April 22 when buses replaced the local railway. The fare was 5 cents. The Empire State Railroad Corporation abandoned its railway operations and auxiliary buses in that city after 40 years of service, carrying out an order of the Public Service Commission which permitted abandonment of the lines on the basis of several years financial losses with a 7-cent fare. Oswego is a city of 22,000.

Opposes Bus Charter. — The plan of the Reading Railway for a subsidiary company to operate buses supplementary to steam train service in 24 Pennsylvania counties was opposed on April 22 by the Philadelphia Rapid Transit Company, Philadelphia, Pa. Its protest with the Public Service Commission at Harrisburg was filed after the Reading Transportation Company, the subsidiary company, had applied for a state charter. The traction company's counsel said action was based upon a determination to protect the electric railway bus rights in suburban districts of Philadelphia and in adjacent counties. The plans of the Reading Railway to enter the bus field were upset last year when Governor Pinchot refused to ratify an application for a charter.

General Transfer System to Be Adopted.—The International Railway and its subsidiary, the International Bus Corporation, Buffalo, have informed the City Council they will adopt a general transfer system covering all bus and car routes if the municipal authorities will approve the company's application for the proposed Kensington-Bailey bus line. If the proposed franchise is granted, the company will not seek to amend existing bus consents covering restricted transfer privileges, but merely will modify its operating rules to give a universal transfer.

Would Abandon Bus Line.—The Key System Transit Company has applied to the California Railroad Commission for permission to abandon operation of its bus service between the intersection of Los Angeles Avenue and Spruce Street and Alta Road and Spruce Street in the city of Berkeley. This bus line has been operated as an experiment by the company and the earnings have been found insufficient to justify its further maintenance. The company asks the commission, in the event that permission to abandon the line is not granted, to charge a fare of 10 cents, with free transfer privilege to the Spruce Street car line, and a 3-cent transfer charge from the Spruce Street car line to the bus line.

Financial and Corporate

Sale of United Railways Set for May 25

The properties of the United Railways, St. Louis, Mo., including trackage, franchises, rolling stock, lands and all appurtenances, will be sold by Special Master William L. Igoe, acting for the United States District Court on May 25.

The property will be bought in for the St. Louis Public Service Company, organized by the reorganization committee of the United Railways to take over and operate the system when the receivership is terminated. The property will be bought subject to the lien of the United Railways general bond issue and the consolidated first mortgage of the St. Louis & Suburban Railway. The property has been in receivership since 1919.

On application of the Mercantile Trust Company, Judge Faris on April 19 set May 23 as the date for a hearing on a proposed amendment of the allowance of interest on approximately $3,000,000 of unsecured claims against the United Railways. These claims include $2,396,322 on mill tax judgment with 6 per cent interest to Aug. 5, 1926, due St. Louis. A federal law is said to prohibit the payment of interest on claims during receivership. The Mercantile Trust Company, trustee for the St. Louis Transit bonds, has asked interest be allowed only to April 12, 1919. Counsel for the trust company informed Judge Faris that court orders allowing the claims with interest up to Aug. 5, 1926, have been oversights by the attorneys who drew up the papers. With interest to date the city's mill tax claim aggregates $2,600,000.

Another Liquidation Dividend by Toronto Railway

Shareholders of Toronto Railway, Toronto, Ont., which has been in process of liquidation for several years, will be notified in the next few days of a disbursement of $1.50 a share on the capital stock of the company. This interim payment will bring the total liquidation dividend so far paid to $115.50 a share.

The work of winding up the company awaits disposition of two suits at law, one by the company and one against it. The first is a claim for about $55,000 from the Niagara Parks Commission, representing a deposit and accrued interest. This deposit was made many years ago on behalf of the Electrical Development Company as a guarantee against claims for physical damage to concessions, etc., in the park while certain work was in process. The time for the filing of claims against this fund expired more than ten years ago. The park commission has declined to pay over the amount until final settlement of claims made by the city of Niagara Falls. It is understood that the railway is willing that the commission settle the claim out of court for what it considers a reasonable amount.

The suit against the company has been brought by an engineer formerly employed under the chief engineer of the railway. The plaintiff in this action claims $25,000 on account of patents developed while he was connected with the railway. He also contends that he did not receive proper notice of dismissal from the employ of the railway company.

These two matters are the only ones which are delaying the final wind-up of the Toronto Railway.

The property of the Toronto Railway was taken over by the city and is now included in the municipal system under the direction of the Toronto Transportation Commission.

Bids Received for Sale of Detroit Carhouse Property

In response to the request of the Street Railway Commission at Detroit, Mich., for bids for the sale of property for which the department has no practical use adjacent to the Woodward Avenue carhouse, a high bid in the amount of $460,000 was obtained. The property has a frontage of 500 ft. on Woodward Avenue and a depth of 100 ft. The plot is opposite the Highland Park plant of the Ford Motor Company. The sale at this price, which was the highest of several bids received, was not approved by the Council.

Some time ago Del A. Smith asked approval of the expenditure of $280,000 for a west side carhouse site as a step in carrying out plans to split the Grand River-Jefferson Street car line into two lines. A site of 14 acres on Coolidge Avenue was suggested for the carhouse, together with a garage for Grand River line buses. A new carhouse having a capacity of 50 trains was planned.

Railways Not Earning Fair Return on Investment

Statistics Covering Operations in 1926 Reveal Increase of Nearly 23,000,000 Car-Miles and 46,000,000 Bus-Miles—Total Service Mileage 2,087,282,159—Return on Investment Slightly Over 4 Per Cent for Total Group—Fares Are Still Too Low

TABLES summarizing the operations of the electric railway industry in 1926 show that the confidence of the electric railways in the future of their business is increasing. They are expanding their service and believe in their future. In particular the results shown in the separate statements for city lines indicate that their intensive efforts to develop their service are having their effect in increased earnings. Their net income was $24,933,183 in 1926, compared with $22,996,661 in 1925, an increase of 8.42 per cent.

Furthermore, many other companies are beginning to share in this improvement, among them smaller companies which heretofore have had very little share in the better conditions which the large companies have been experiencing. This is brought out when the statement for the city companies is broken down into groups according to the size of the companies.

The intermediate group, comprising companies earning from $250,000 to $1,000,000 a year, showed an increase in their gross income, before fixed charges, of 2.21 per cent, which compares favorably with the decrease of 1.63 per cent in this item reported by the large city companies earning more

Statistics Compiled by American Electric Railway Association

COMBINED OPERATIONS OF 353* COMPANIES

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$824,827,471	$817,203,432	$7,624,039	0.93
Railway operating expense	605,871,716	598,763,102	7,108,614	1.19
Net operating revenue	$218,955,755	$218,440,330	$515,425	0.24
Operating ratio (per cent)	73.45	73.27	0.18	0.25
Miles of track	32,096.12	32,155.46	(D) 59.34	(D)0.18
Revenue passengers	11,313,080,443	11,278,726,640	34,353,803	0.30
Total passengers	14,222,469,639	14,146,925,787	75,543,852	0.53
Car-miles (revenue)	1,963,934,988	1,941,047,710	22,887,278	1.18

COMBINED OPERATIONS OF 353 RAILWAY COMPANIES AND 138 CONTROLLED BUS UNDERTAKINGS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Operating revenue	$857,062,186	$836,181,160	$20,881,026	2.50
Operating expense	638,222,627	618,635,798	19,586,829	3.16
Net operating revenue	$218,839,559	$217,545,362	$1,294,197	0.59
Operating ratio (per cent)	74.46	73.98	0.48	0.64
Miles of track and bus route	37,746	36,005	1,741	4.83
Revenue passengers	11,713,019,298	11,535,252,086	177,767,212	1.54
Total passengers	14,660,626,195	14,423,628,227	236,997,968	1.64
Car and bus-miles	2,087,282,159	2,017,475,646	69,806,513	3.46

than $1,000,000 per year. Unfortunately for the smaller companies, they were unable to reduce their fixed charges as the larger companies did, but on the contrary had an increase in these charges of 5.51 per cent, which produced a decrease in their net income of 6.08 per cent, compared with an increase in the net income of the larger companies of 8.99 per cent. The failure to reduce their fixed charges is a misfortune that can probably be remedied by a careful study of their capital structure.

Edmund J. Murphy, the chief statistician of the American Electric Railway Association, writing in *Aera* for May, says that the significant thing to be noted is that in so far as purely operating results are concerned, this group was able to effect a greater improvement during the year than the larger companies did.

SMALL COMPANIES LOSING GROUND

The companies in the third city group, earning less than $250,000 a year, have not yet begun to experience the better conditions which have had a favorable effect on the other two groups. These small companies are still losing ground. However, it should be borne in mind in connection with these companies that they constitute only a fraction of the electric railway industry. Out of a total of 8,919,016,768 passengers carried by 231 companies that have been classified into groups only 80,484,333, or about 0.9 per cent, were carried by companies in the Class C group. Their influence on any statement reflecting the operations of the whole industry, therefore, is practically negligible.

In terms of vehicle-miles operated, the industry rendered more service in 1926 than in any previous year of its history. The 353 companies operated 22,887,278 more car-miles last year than they did in 1925. The total revenue car-miles operated in 1926 was 1,963,934,988, compared with 1,941,047,710 in 1925. In addition these companies operated 123,347,171 bus-miles, 46,919,235 more than in 1925. The total service-miles operated, therefore, was 2,087,282,159 in 1926, as against 2,017,475,646 in 1925, an increase of 69,806,513 service-miles.

INCREASED SERVICE AT INCREASED EXPENSE

The figures clearly indicate that the electric railways are using the motor bus to extend their transportation service. On the other hand, it is made equally clear that they are not curtailing or reducing their rail service, but on the contrary are giving more rail service, measured in car-miles, than they ever did. The number of miles of single track operated by these 353 companies in 1926 was 32,096, about 60 miles less than they operated in 1925. It represents about 78 per cent of all the electric railway track in the country. The number of miles of bus route operated in 1926 was 5,650, an increase of 1,800 miles. It is practically all additional service.

This additional service, of course, meant increased expenditure on the part of the railways. Operating costs remained approximately the same in both years; the average cost per car-mile was 33.77 cents in 1926 compared with 33.55 cents in 1925, an increase of only 0.7 per cent. The number of cars operated and the number of miles of track, as already indicated, were also approximately the same. The additional miles operated over this track, however, added about $7,000,000 to the expense. In the bus end of the business 1,220 new buses were added during the year. If the investment per bus is put at $7,500, as has been suggested by one authority, the probable amount of new money put into the business in this one year was $9,100,000. The additional mileage operated by the buses cost the companies about $12,500,000 in increased operating expenses. As Mr. Murphy sees it the increased service rendered cost the companies $19,500,000 in increased operating expenses and $9,100,000 in new equipment, or a total of $28,600,000.

On their rail and bus lines in 1926 these 353 companies alone carried 14,660,626,195 passengers, 236,997,968 more than they carried in 1925. Analysis of the complete returns makes it unmistakably clear that the revenue received does not cover the cost of the service. According to Mr. Murphy the return to the companies, taking the group as a whole, is in no way commensurate with the magnitude of the service rendered; is not sufficient, in fact, to enable the industry to finance itself properly. After expatiating on the facts, the author concludes that "with more than half of their capitalization represented by funded obligations, and with the cost of money running up to 7 per cent to them, it is not hard to understand why there is so little left for the stockholder." Out of 231 companies reporting only 45 paid any dividends.

INADEQUACY OF FARES DISCUSSED

In extenuation of this idea it is pointed out that the average fare per revenue passenger in 1926 was 7.1 cents. It was the same in 1925. There was no change. In 1912 the average fare per revenue passenger was 5.27 cents. In the intervening years, therefore, the average fare has risen about 35 per cent. At the present time, according to current indexes, the cost of materials used by electric railways is 53 per cent above pre-war levels, while wages are up approximately 110 per cent. Weighing these in the proportion

Statistics Compiled by American Electric Railway Association

Part I—Combined Operating Reports of 231 Electric Railways for the Calendar Year 1926 Compared with 1925

TABLE I—COMBINED INCOME STATEMENT

	1926	1925	Increase or (D) Decrease Total	Increase or (D) Decrease Per Cent	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Cents per Car-Mile Per Cent Increase
Railway operating revenue	$554,654,259	$554,286.419	$367,840	0.07	44.83	45.01	(D) 0.40
Railway operating expense	417,744,496	413,196,152	4,548,344	1.10	33.77	33.55	0.66
Net operating revenue	$136,909,763	$141,090,267	(D) $4,180,504	(D) 2.96	11.06	11.46	(D) 3.49
Net revenue: Auxiliary operations	2,735,257	2,861,439	(D) 126,182	(D) 4.41	0.22	0.23	(D) 4.35
Taxes	34,693,231	34,851,679	(D) 158,448	(D) 0.45	2.80	2.83	(D) 1.06
Operating income	$104,951,789	$109,100,027	(D) $4,148,238	(D) 3.80	8.48	8.86	(D) 4.29
Non-operating income	10,370,196	9,739,426	630,770	6.47	0.84	0.79	6.33
Gross income	$115,321,985	$118,839,453	(D) $3,517,468	(D) 2.96	9.32	9.65	(D) 3.42
Deductions from gross income	92,734,764	95,622,222	(D) 2,887,458	(D) 3.02	7.50	7.76	(D) 3.35
Net income	$22,587,221	$23,217,231	(D) 630,010	(D) 2.71	1.82	1.89	(D) 3.70
Dividends	*a*$15,632,999	*b*$14,550,968	1,082,031	7.44	.....	.....	.....
Operating ratio (per cent)	75.32	74.55	0.77	1.03	.....	.....	.....
Ratio: Net income to operating revenue	4.07	4.19	(D) 0.12	(D) 2.86	.....	.....	.....

a Reported by 45 companies. *b* Reported by 46 companies.

TABLE II—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1926	1925	Increase or (D) Decrease Total	Increase or (D) Decrease Per Cent	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Cents per Car-Mile Per Cent Increase
Way and structures	$60,122,195	$60,572,914	(D) $450,719	(D) 0.74	4.86	4.92	(D) 1.22
Equipment	55,051,245	53,372,489	1,678,756	3.15	4.45	4.33	2.77
Power	56,495,959	56,830,036	(D) 334,077	(D) 0.59	4.57	4.61	(D) 0.87
Conducting transportation	182,274,493	181,026,591	1,247,902	6.69	14.74	14.71	0.20
Traffic	2,235,114	1,905,539	329,575	17.30	0.18	0.15	0.20
General and miscellaneous	60,309,743	58,085,769	2,223,974	3.83	4.87	4.72	3.18
Transportation for investment—Cr.	—510,696	—316,832	—193,864	61.19	0.04	0.03	33.33
Total operating expense	*a*$417,744,496	*b*$413,196,152	$4,548,344	1.10	*c*33.77	*d*33.55	0.66

c Includes $1,766,443 undistributed expense. *d* Includes $1,719,646 undistributed expense.

in which they enter into the cost of operation, 93 per cent is reached as the average increase in cost of materials and labor. In order to produce the same net today as in 1912, therefore, the average fare should have increased 56 per cent instead of the 35 per cent it has increased. In other words, the average fare of this group of companies should have been 8.22 cents instead of 7.10 cents.

The author says:

FINANCIAL STRUCTURES IMPROVED

> Undoubtedly this failure to raise fares in proportion to the increase in the cost of operation has been an important cause, if not the most important cause, of the present condition of the electric railways. On the other hand, it cannot be denied that many electric railway managements have neglected to take advantage of improved methods and equipment which might help them to better their condition. They have been especially derelict in the field of public relations, which is undoubtedly the master key to the solution of their problems. This is proved by what has been accomplished by the more progressive managements among both the larger and smaller properties.
>
> Operating under conditions identical with those of the rest of the industry they have by their skill and their readiness to adopt new ideas succeeded in holding or increasing their traffic and enlisting the co-operation of their patrons so that as a result they have been able to secure more equitable consideration from their public authorities. Fortunately more and more managements are learning from these examples that at least part of their problem is solvable by their own efforts and they can be counted upon to put forth greater efforts along better directed lines in the future than they have in the past.

As the author sees it, the companies are making serious efforts to recast their financial structures along more conservative lines as was recommended in the report of the Advisory Committee on Electric Railway Finance. As a result of this reduction in fixed charges the net income of these companies was only slightly less than in 1925, $630,010, or 2.71 per cent less. The final net income in 1926 was $22,587,221, as compared with $23,217,231 in 1925. As has already been pointed out, if the city companies in the intermediate group could have effected a reduction in their fixed charges similar to that of the "A" companies this net income would have been increased materially.

Practically all of this net income was earned by the city companies alone. The straight out interurban lines as a group operated at a deficit of $3,692,565, while the combination city and interurban companies earned a net income of only $1,346,603, which was a decrease of 62.66 per cent from the net income of $3,605,885 earned in 1925. Presumably this net was produced by the city operations in this group as distinct from the interurban divisions. It does not entirely offset the deficit in the straight interurban group. This was done by the city companies, which earned a net income of $24,933,183, an increase of $1,936,522, or 8.42 per cent, over the net income of 1925.

NET INCOME EARNED BY CLASS A COMPANIES

Practically all of the net income of the city companies was earned by the Class A companies, the large companies having annual operating revenues of $1,000,000 or more. This group produced $24,212,808 of the net income of the whole city group, an increase of $1,997,080, or 8.99 per cent. The Class B group of city companies, having annual revenues between $250,000 and $1,000,000, earned a net income of $768,071, a decrease of 6.08 per cent from 1925, while the Class C group, with annual revenues of less than $250,000 per

TABLE III—OPERATING STATISTICS—231 COMPANIES

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	1,198,394,439	1,194,479,026	3,915,413	0.33
Total revenue car-miles	1,237,170,988	1,231,595,630	5,575,358	0.45
Revenue passengers[1]...	7,091,099,427	7,159,077,205	(D) 67,977,778	(D) 0.95
Transfer passengers[2]...	1,763,652,908	1,745,789,612	17,863,296	1.02
Total passengers[1]......	8,919,016,768	8,971,547,179	(D) 52,530,411	(D) 0.59
Passenger revenue.....	$517,836,495	$518,970,998	(D) $1,134,503	(D) 0.22
Revenue car-hours[3]....	113,847,101	113,958,283	(D) 111,182	(D) 0.10
Passenger car-hours[3]...	111,866,605	111,978,615	(D) 112,010	(D) 0.10
Miles of single track....	24,082.70	24,045.60	37.10	0.15
Passenger cars operated a[4]	28,362	28,401	(D) 39	(D) 0.14

a Average maximum number of passenger cars in service daily.
[1] Reported by 276 companies. [2] Reported by 156 companies.
[3] Reported by 199 companies. [4] Reported by 191 companies.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES—231 COMPANIES

	1926	1925	Per Cent Increase or (D) Decrease
Railway operating revenue..........	$554,654,259	$554,286,419	0.07
Per mile of single track...........	$23,031	$23,051	(D) 0.09
Gross income.....................	$15,321,985	$118,839,453	(D) 2.96
Per mile of single track..........	$4,789	$4,942	(D) 3.10
Passenger revenue.................	$517,836,495	$518,970,998	(D) 0.22
Per revenue passenger...........	[1]7.1c	[1]7.1c	......
Per total passenger..............	[1]5.7c	[1]5.7c	......
Per mile of single track..........	$21,502	$21,583	0.38
Per passenger car-mile..........	43.2c	43.4c	(D) 0.46
Per car operated................	[3]$16,192	[3]$16,205	(D) 0.08
Per passenger car-hour..........	[4]$4.09	[4]$4.10	(D) 0.24
Revenue passengers.............	[1]7,091,099,427	[1]7,159,077,205	(D) 0.95
Per mile of single track..........	[1]304,599	[1]308,115	(D) 1.14
Per passenger car-mile..........	[1]6.0	[1]6.1	(D) 1.64
Per car operated................	[5]224,011	[5]225,796	(D) 0.79
Per passenger car-hour..........	[6]58	[6]59	(D) 1.69
Total passengers..................	[1]8,919,016,768	[1]8,971,547,179	(D) 0.59
Per mile of single track..........	[1]383,118	[1]386,120	(D) 0.77
Per passenger car-mile..........	[1]7.6	[1]7.7	(D) 1.30
Ratio: Transfer passengers to revenue passengers (per cent)............	24.9%	24.4%	2.05
Revenue car miles.................	1,237,170,988	1,231,595,630	0.45
Per mile of single track..........	51,372	51,219	0.30
Per car operated................	[3]38,599	[3]38,385	0.56
Per car-hour....................	[2]9.27	[2]9.24	0.32
Car-hours.........................	[2]113,847,101	[2]113,958,283	(D) 0.10
Per car operated................	[7]4,068	[7]4,046	0.54

[1] 226 companies. [2] 199 companies. [3] 191 companies. [4] 198 companies.
[5] 184 companies. [6] 195 companies. [7] 169 companies.

Part II—City Lines—Combined Reports of 98 Companies Operating City Lines Exclusively

TABLE V—COMBINED INCOME STATEMENT

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue..............	$396,636,549	$394,400,201	$2,236,348	0.57
Railway operating expense.............	292,176,016	288,334,927	3,841,089	1.33
Net operating revenue	$104,460,533	$106,065,274	(D) $1,604,741	(D) 1.51
Net revenue: Auxiliary operations..........	946,992	1,038,075	(D) 91,083	(D) 8.77
Taxes................	24,656,645	24,635,667	20,978	0.09
Operating income....	$80,750,880	$82,467,682	(D) $1,716,802	(D) 2.08
Non-operating income..	5,847,424	5,456,818	390,606	7.16
Gross income.......	$86,598,304	$87,924,500	(D) $1,326,196	(D) 1.51
Deductions from gross income............	61,665,121	64,927,839	(D) 3,262,718	(D) 5.03
Net income.........	$24,933,183	$22,996,661	$1,936,522	8.42
Dividends............	a$14,114,326	a$12,248,138	$1,866,188	15.24
Operating ratio, per cent	73.66	73.11	0.55	0.75
Ratio: Net income to operating revenue...	6.29	5.83	0.46	7.89

a Reported by 29 companies.

TABLE VI—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures....	$38,974,130	$40,174,856	(D) $1,200,726	(D) 2.99
Equipment...........	38,330,429	36,959,018	1,371,411	3.71
Power................	37,970,036	38,095,788	(D) 125,752	(D) 0.33
Conducting transportation...............	135,453,291	133,530,457	1,922,834	1.44
Traffic...............	1,042,390	716,606	325,784	45.46
General and miscellaneous...............	38,741,674	37,268,505	1,473,169	3.95
Transportation for investment—Cr.......	—83,802	—114,209	(D) —30,407	(D) 26.62
Total operating expense............	a$292,176,016	b$288,334,927	$3,841,089	1.33

a Includes $1,747,868 undistributed expense.
b Includes $1,703,906 undistributed expense.

TABLE VII—OPERATING STATISTICS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	866,532,242	856,395,412	10,136,830	1.18
Total revenue car-miles	868,828,647	859,048,561	9,780,086	1.14
Revenue passengers[1]...	5,540,229,291	5,554,933,217	(D) 14,703,926	(D) 0.26
Transfer passengers[2]...	1,574,719,591	1,554,930,129	19,789,462	1.27
Total passengers[1]......	7,145,851,769	7,142,030,764	3,821,005	0.05
Passenger revenue.....	$385,787,072	$383,948,891	$1,838,181	0.48
Revenue car-hours[3]....	85,018,306	84,572,717	445,589	0.53
Passenger car-hours[3]...	84,800,918	84,346,146	454,772	0.54
Miles of single track...	11,155.06	11,131.88	23.18	0.21
Passenger cars operated[4]a.............	21,369	21,325	44	0.21

a Average maximum number of passenger cars in service daily. [1] Reported by 95 companies. [2] Reported by 76 companies. [3] Reported by 86 companies. [4] Reported by 88 companies.

year, had a deficit of $47,696, which was $10,805 greater than in 1925. All of the groups of the interurban companies operated at a deficit, while among the combination companies only the Class A group earned any net income. It amounted to $2,388,006 and represented a decrease of 50.48 per cent from 1925.

It is quite apparent from the foregoing that only the larger city companies made any money in 1926—those in the class earning more than $250,000 per year. This is the class that has been freest from competition and has been least affected by the use of the private automobile. It is also the class whose problems have received the most careful consideration, probably for the very reason that no satisfactory competitive service was available. In consequence the companies in this group, not all of them, perhaps, but some of them, have succeeded in securing rates that in some measure meet the cost of service.

The rest of the companies in the other groups are struggling, with varying degrees of success, to give a service the cost of which is not covered by their revenues. Either these companies must receive adequate revenues or the service they give must be curtailed. The companies are making a commendable effort to improve and extend their service wherever there seems to be the faintest chance of justifying it; these efforts must receive the co-operation of the traveling public expressed in an adequate system of rates.

This is particularly true in the smaller communities and outlying districts. The tables show that the smaller companies are in a precarious situation, are not in fact earning their fixed charges. Their condition is of course due to the omnipresent private automobile, whose inroads into the passenger traffic of the local street railways during the past ten years have cut down their sources of revenue. The problem presented is a serious one both to the companies themselves and the public they serve. In the case of the former there is a large investment at stake, while in the case of the public a decision has to be made as to whether they want and are willing to pay for a common carrier service, to which they have become accustomed but which they no longer patronize as intensively as they once did. It is a question of adequate rates or no service. When a certain fraction of the patrons of a railway cease to use it, the remaining fraction must naturally pay a higher per capita rate if they

Part III—Interurban Lines—Combined Reports of 50 Companies Operating Interurban Lines Exclusively

TABLE VIII—INCOME STATEMENT OF 50 ELECTRIC RAILWAYS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$20,861,035	$20,985,530	(D) $124,495	(D) 0.59
Railway operating expense	17,590,451	17,499,048	91,403	0.52
Net operating revenue	$3,270,584	$3,486,482	(D) $215,898	(D) 6.19
Net revenue: Auxiliary operations	180,441	174,934	5,507	3.15
Taxes	1,236,234	1,293,882	(D) 57,648	(D) 4.46
Operating income	$2,214,791	$2,367,534	(D) $152,743	(D) 6.45
Non-operating income	218,781	237,561	(D) 18,780	(D) 7.91
Gross income	$2,433,572	$2,605,095	(D) $171,523	(D) 6.58
Deductions from gross income	6,126,137	5,990,410	135,727	2.27
Net income	*$3,692,565	*$3,385,315	(D) $307,250	....
Dividends	a$178,323	a$170,766	$7,557	4.43
Operating ratio, (per cent)	84.32	83.39	0.93	1.11
Ratio: Net income to operating revenue	....	....	....	....

* Deficit. *a* Reported by three companies.

TABLE IX—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$3,101,579	$3,215,090	(D) $113,511	(D) 3.53
Equipment	2,140,856	2,009,202	131,654	6.55
Power	3,047,981	3,076,690	(D) 28,709	(D) 0.93
Conducting transportation	5,617,926	5,617,182	744	0.01
Traffic	356,658	360,250	(D) 3,592	(D) 1.00
General and miscellaneour	3,314,371	3,215,915	98,456	3.06
Transportation for investment—Cr.	—7,495	—11,021	(D) —3,526	(D) 31.99
Total operating expense	a$17,590,451	b$17,499,048	$91,403	0.52

a Includes $18,575 undistributed expense.
b Includes $15,740 undistributed expense.

TABLE X—OPERATING STATISTICS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	35,005,554	35,543,691	(D) 538,137	(D) 1.51
Total revenue car-miles	46,299,079	45,753,368	545,711	1.19
Revenue passengers	53,342,580	55,097,566	(D) 1,754,986	(D) 3.19
Transfer passengers[1]	1,284,850	1,293,212	(D) 8,362	(D) 0.65
Total passengers	55,929,159	57,710,107	(D) 1,780,948	(D) 3.09
Passenger revenue	$12,958,716	$13,477,663	(D) $518,947	(D) 3.85
Revenue car-hours[2]	1,990,427	1,933,574	56,853	2.94
Passenger car-hours[2]	1,261,551	1,247,595	13,956	1.12
Miles of single track	3,212.48	3,211.53	0.95	0.03
Passenger cars operated[3]*a*	616	595	21	3.53

a Average maximum number of passenger cars in service daily. [1] Reported by 16 companies. [2] Reported by 37 companies. [3] Reported by 40 companies

Part IV—City and Interurban Lines—Combined Reports of 83 Companies Operating Combined City and Interurban Lines

TABLE XI—INCOME STATEMENT

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$137,156,675	$138,900,688	(D) $1,744,013	(D) 1.26
Railway operating expense	107,978,029	107,362,177	615,852	0.57
Net operating revenue	$29,178,646	$31,538,511	(D) $2,359,865	(D) 7.48
Net revenue: Auxiliary operations	1,607,824	1,648,430	(D) 40,606	(D) 2.46
Taxes	8,800,352	8,922,130	(D) 121,778	(D) 1.36
Operating income	$21,986,118	$24,264,811	(D) $2,278,693	(D) 9.39
Non-operating income	4,303,991	4,045,047	258,944	6.40
Gross income	$26,290,109	$28,309,858	(D) $2,019,749	(D) 7.13
Deductions from gross income	24,943,506	24,703,973	239,533	0.97
Net income	$1,346,603	$3,605,885	(D) $2,259,282	(D) 62.66
Dividends	a$1,340,350	b$2,132,064	(D) $791,714	(D) 37.13
Operating ratio, per cent	78.73	77.29	0.44	1.86
Ratio: Net income to operating revenue	0.98	2.60	(D) 1.62	(D) 62.31

a Reported by 13 companies. *b* Reported by 14 companies.

TABLE XII—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$18,046,486	$17,182,968	$863,518	5.03
Equipment	14,579,960	14,404,269	175,691	1.22
Power	15,477,942	15,657,558	(D) 179,616	(D) 1.15
Conducting transportation	41,203,276	41,878,952	(D) 675,676	(D) 1.61
Traffic	836,066	828,683	7,383	0.89
General and miscellaneous	18,253,698	17,601,349	652,349	3.71
Transportation for investment—Cr.	—419,399	—191,602	—227,797	118.89
Total operating expense	$107,978,029	$107,362,177	$615,852	0.57

TABLE XIII—OPERATING STATISTICS

	1926	1925	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	296,856,643	302,539,923	(D) 5,683,280	(D) 1.88
Total revenue car-miles	322,043,262	326,793,701	(D) 4,750,439	(D) 1.45
Revenue passengers[1]	1,497,527,556	1,549,046,422	(D) 51,518,866	(D) 3.33
Transfer passengers[2]	187,648,467	189,566,271	(D) 1,917,804	(D) 1.01
Total passengers[1]	1,717,235,840	1,771,806,308	(D) 54,570,468	(D) 3.08
Passenger revenue	$119,090,707	$121,544,444	(D) $2,453,737	(D) 2.02
Revenue car-hours[3]	26,838,368	27,451,992	(D) 613,624	(D) 2.24
Passenger car-hours[3]	25,804,136	26,384,874	(D) 580,738	(D) 2.20
Miles of single track	9,715.16	9,702.19	12.97	0.13
Passenger cars operated[4]*a*	6,377	6,481	(D) 104	(D) 1.60

a Average maximum number of passenger cars in service daily. [1] Reported by 81 companies. [2] Reported by 63 companies. [3] Reported by 76 companies. [4] Reported by 63 companies.

Part V—Combined Statements of All Three Types of Companies on a Car-Mile Basis

TABLE XIV—INCOME STATEMENT OF 98 CITY COMPANIES, 50 INTERURBAN COMPANIES AND 83 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease
Railway operating revenue..	45.65	45.91	(D)0.56	45.06	45.87	(D)1.77	42.59	42.50	0.21
Railway operating expense...	33.63	33.56	0.21	37.99	38.25	(D)0.68	33.53	32.85	2.07
Net operating revenue....	12.02	12.35	(D)2.67	7.07	7.62	(D)6.22	9.06	9.65	(D)6.11
Net revenue: Auxiliary operations..................	0.11	0.12	(D)8.33	0.39	0.38	2.63	0.50	0.50	....
Taxes.....................	2.84	2.87	(D)1.03	2.67	2.83	(D) 5.65	2.73	2.73	....
Operating income.........	9.29	9.60	(D)3.23	4.79	5.17	(D) 7.35	6.83	7.42	(D)7.95
Non-operating income.......	0.68	0.64	6.25	0.47	0.52	(D)10.62	1.34	1.24	8.06
Gross income............	9.97	10.24	(D)2.64	5.26	5.69	(D) 7.56	8.17	8.66	(D)5.66
Deductions from gross income	7.10	7.56	(D)6.08	13.23	13.09	1.07	7.75	7.56	2.51
Net income..............	2.87	2.68	7.09	*7.97	*7.40	....	0.42	1.10	(D)61.82

* Deficit.

TABLE XV—OPERATING EXPENSES OF 98 CITY COMPANIES, 50 INTERURBAN COMPANIES AND 83 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease	Cents per Car-Mile 1926	Cents per Car-Mile 1925	Per Cent Increase or (D) Decrease
Way and structures.........	4.49	4.68	(D)4.06	6.70	7.03	(D)4.69	5.60	5.26	6.46
Equipment...............	4.41	4.30	2.56	4.62	4.39	5.24	4.53	4.41	2.72
Power..................	4.37	4.43	(D)1.35	6.58	6.72	(D)2.08	4.81	4.79	0.42
Conducting transportation....	15.59	15.54	0.32	12.13	12.28	(D)1.22	12.79	12.82	(D)0.23
Traffic..................	0.12	0.08	50.00	0.77	0.79	(D)3.92	0.26	0.25	4.00
General and miscellaneous...	4.46	4.34	2.76	7.17	7.03	1.99	5.67	5.38	5.39
Transportation for invest.—Cr..................	0.01	0.01	....	0.02	0.02	....	0.13	0.06	116.67
*Total operating expenses.	33.63	33.56	0.21	37.99	38.25	(D)0.68	33.53	32.85	2.07
* Undistributed expenses included in total...........	0.20	0.20	....	0.04	0.03	....	.....	.....	....

want the service continued, especially if, as is actually the case, the cost of operation has meanwhile increased. If the rate necessary to maintain service is more than the service is worth to the people of the community, service must be abandoned.

This is true whether the line be a bus line or a railway. In communities where the riding habit is low and the density of traffic consequently below a certain minimum, the bus undoubtedly is more economical, but the point to be made here is that neither vehicle can hope to operate successfully at the fare which formerly sufficed for the railway. When only a fraction of the former patrons now use the service, rates must be recast on a new basis. And in view of the fact that in many of these small communities there is some doubt as to whether any rate which patrons are willing to pay would yield a return on the investment, it would seem logical in these cases to leave the operator free to charge whatever rate he wants to so that he may experiment to determine if there is any rate that will yield a fair return. It is no longer a question of confiscation or extortion, but of whether or not there is an economic demand for the service.

The smaller companies as a group are not earning their fixed charges—are operating at a deficit which was larger in 1926 than in 1925. Their traffic continues to fall off rapidly. The paramount question with respect to them is whether or not they will survive. Unquestionably it would seem to be the part of wisdom for any of these small communities that want to keep their street car service—and the evidence is that all of them do—to relieve them of all burdensome restrictions and taxes and give them a free hand to see if they can work out their own salvation.

In conclusion Mr. Murphy says:

> The problems of these small companies are, as has already been said, acute and serious, but at this point, perhaps, it should be said again that they constitute a very small fraction of the electric railway industry and what has been said about them in no way vitiates the statements that were previously made about the indusry as a whole.
>
> The other companies, the great bulk of the industry, while by no means prosperous, are nevertheless confidently going forward with plans for the future. For them the year 1926 was marked by unusually steady,

Part VI—Derived Ratios

TABLE XVI—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

	98 City Companies			50 Interurban Companies			83 Companies Operating Both City and Interurban Lines		
	1926	1925	Per Cent Increase or (D) Decrease	1926	1925	Per Cent Increase or (D) Decrease	1926	1925	Per Cent Increase or (D) Decrease
Railway operating revenue...........	$396,636,549	$394,400,201	0.57	$20,861,035	$20,985,530	(D) 0.59	$137,156,675	$138,900,688	(D) 1.28
Per mile of single track............	$35,557	$35,430	0.36	6,494	$6,534	(D) 0.61	$14,118	$14,316	(D) 1.36
Gross income.......................	$86,598,304	$87,924,500	(D) 1.51	$2,433,572	$2,605,095	(D) 6.58	$26,290,109	$28,309,858	(D) 7.13
Per mile of single track............	$7,763	$7,898	(D) 1.71	$758	$811	(D) 6.54	$2,706	$2,918	(D) 7.27
Passenger revenue..................	$385,787,072	$383,948,891	0.48	$12,958,716	$13,477,663	(D) 3.85	$119,090,707	$121,544,444	(D) 2.02
Per revenue passenger.............	[1]6.8c.	[1]6.8c.	....	24.3c.	24.5c.	(D) 0.70	[2]7.8c.	[2]2.7c.	1.30
Per total passenger...............	[1]5.3c.	[1]5.3c.	....	23.2c	23.4c.	(D) 0.86	[2]6.8c.	[2]6.7c.	1.49
Per mile of single track............	$34,584	$34,491	0.27	$4,034	$4,197	(D) 3.88	$12,258	$12,528	(D) 2.16
Per passenger car-mile............	44.5c.	44.8c.	(D) 0.67	37.0c.	37.9c.	(D) 2.35	40.1c.	40.2c.	(D) 0.25
Per car operated..................	[3]$16,036	[3]$15,981	0.34	[5]$18,112	[5]$19,306	(D) 6.18	[7]$16,527	[7]$16,655	(D) 0.77
Per passenger car-hour............	[4]$4.09	[4]$4.11	(D) 0.49	[6]$6.44	[6]$6.52	(D) 1.23	[8]$3.98	[8]$3.98	....
Revenue passengers................	[1]5,540,229,291	[1]5,554.933,217	(D) 0.26	53,342,580	55,097,566	(D) 3.19	[2]1,497,527,556	[2]1,549,046,422	(D) 3.33
Per mile of single track............	[1]529,448	[1]532,397	(D) 0.55	16,605	17,156	(D) 3.21	[2]155,937	[2]161,531	(D) 3.46
Per passenger car-mile............	[1]6.5	[1]6.6	(D) 1.52	1.55	1.6	(D) 6.25	[2]5.1	[2]5.2	(D) 1.98
Per car operated..................	[9]231,566	[9]232,402	(D) 0.24	[5]77,745	[5]82,661	(D) 5.95	[11]213,349	[11]217,662	(D) 1.99
Per passenger car-hour............	[10]60	[10]61	(D) 1.64	[6]33	[6]34	(D) 2.94	[12]53	[12]54	(D) 1.84
Total passengers....................	[1]7,145,851,769	[1]7,142,030,764	0.05	55,929,159	57,710,107	(D) 3.09	[2]1,717,235,840	[2]1,771.806,308	(D) 3.08
Per mile of single track............	[1]682,888	[1]684,508	(D) 0.24	17,410	17,969	(D) 3.11	[2]178,815	[2]184,760	(D) 3.22
Per passenger car-mile.............	[1]8.5	[1]8.5	(D) 1.18	1.6	1.6	....	[2]5.9	[2]5.9	....
Ratio									
Transfer passengers to revenue passengers (per cent)..............	28.4%	28.0%	1.43	2.4%	2.3%	4.35	12.5%	12.2%	2.46
Revenue car miles.................	868,828,647	859,048,561	1.14	46,299,079	45,753,368	1.19	322,043,262	326,793,701	(D) 1.45
Per mile of single track............	77,887	77,170	0.93	14,412	14,247	1.16	33,149	33,682	(D) 1.58
Per car operated..................	[3]36.320	[3]35.908	1.15	[5]61,621	[5]62,202	(D) 0.93	[7]44,013	[7]44.352	(D) 0.76
Per car-mile......................	[4]9.0	[4]8.9	1.12	[6]13.1	[6]13.1	....	[13]9.9	[13]9.9	....
Car-hours.........................	[4]85,018,306	[4]84,572,717	0.53	[6]1,990,427	[6]1,933,574	2.94	[13]26,838,368	[13]27,451,992	(D) 2.24
Per car operated..................	[14]3,990	[14]3,969	0.53	[15]4,309	[15]4,321	(D) 0.28	[16]4,326	[16]4,289	0.86

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[1] 95 companies
[2] 81 companies
[3] 88 companies
[4] 86 companies
[5] 40 companies
[6] 37 companies
[7] 63 companies
[8] 75 companies
[9] 85 companies
[10] 84 companies
[11] 59 companies
[12] 74 companies
[13] 76 companies
[14] 77 companies
[15] 32 companies
[16] 60 companies

Part VII—Analysis of Income Statement

TABLE XVII—ANALYSIS OF OPERATING STATEMENT—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
	42 Cos. with Revenues of More than $1,000,000 a Year Each	31 City Cos. with Revenues $250,000 to $1,000,000 a Year Each	25 Cos. with Revenues of Less than $250,000 a Year Each	4 Cos. with Revenues of More than $1,000,000 a Year Each	17 Cos. with Revenues of $250,000 to $1,000,000 a Year Each	29 Cos. with Revenues of Less than $250,000 a Year Each	31 Cos. with Revenues of More than $1,000,000 a Year Each	27 Cos. with Revenues of $250,000 to $1,000,000 a Year Each	25 Cos. with Revenues of Less than $250,000 a Year Each
Railway operating revenue	0.59	0.30	(D) 1.67	1.04	(D) 1.04	(D) 2.28	(D) 1.10	(D) 1.86	(D) 3.85
Railway operating expense	1.44	(D) 0.15	(D) 2.06	(D) 0.32	1.66	(D) 1.21	0.95	(D) 1.34	(D) 2.12
Net operating revenue	(D) 1.64	2.26	0.26	6.30	(D) 14.75	(D) 12.10	(D) 7.75	(D) 3.96	(D) 31.66
Net revenue: Auxiliary operations	1.84	(D) 19.03	(D) 37.54	9.48	(D) 1.01	(D) 9.69	(D) 3.13	25.24	....
Taxes	0.50	(D) 9.45	(D) 3.74	3.99	(D) 7.73	(D) 10.81	(D) 0.66	(D) 6.16	(D) 4.70
Operating income	(D) 2.25	2.34	1.60	7.51	(D) 18.03	(D) 13.38	(D) 9.92	(D) 2.58	....
Non-operating income	7.58	(D) 0.09	(D) 26.75	18.00	(D) 16.24	(D) 61.64	(D) 0.95	14.07	63.85
Gross income	(D) 1.63	2.21	(D) 1.55	8.67	(D) 17.99	(D) 25.17	(D) 8.81	1.09	42.46
Deductions from gross income	(D) 5.41	5.51	1.38	3.94	1.16	(D) 0.63	1.19	(D) 0.33	2.21
Net income	8.99	(D) 6.08	....	....	....	....	(D) 50.48	....	....
Dividends	16.29	(D) 14.47	(D) 68.31	....	4.43	....	(D) 53.47	(D) 0.10	17.30
Operating ratio (per cent)	0.84	(D) 0.44	(D) 0.40	(D) 1.35	2.73	1.10	2.08	0.54	1.80
Ratio: Net income to operating revenue	8.43	(D) 6.34	....	....	....	....	(D) 50.00	....	....

TABLE XVIII—OPERATING EXPENSES BY PRIMARY ACCOUNTS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Way and structures	(D) 3.44	7.50	(D) 1.58	(D) 11.42	1.30	(D) 4.47	5.88	0.98	(D) 0.19
Equipment	3.88	1.54	(D) 2.19	14.00	3.47	1.67	1.09	2.31	0.20
Power	0.17	(D) 6.94	(D) 2.76	(D) 0.99	(D) 0.08	(D) 3.34	(D) 0.83	(D) 2.56	(D) 3.00
Conducting transportation	1.56	(D) 0.76	(D) 1.46	0.60	(D) 0.52	0.43	(D) 1.41	(D) 2.34	(D) 5.47
Traffic	45.05	58.85	18.23	(D) 11.90	4.31	0.31	3.29	(D) 9.41	(D) 20.94
General and miscellaneous	4.31	(D) 0.59	(D) 3.41	0.82	5.66	(D) 0.98	4.83	(D) 2.73	1.14
Transportation for investment—Cr.	(D) 27.09	381.68	....	....	(D) 26.98	....	122.77	12.35	(D) 82.42
Total operating expense	1.44	(D) 0.15	(D) 2.06	(D) 0.32	1.66	(D) 1.21	0.95	(D) 1.34	(D) 2.12

TABLE XIX—OPERATING STATISTICS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Passenger car-miles	1.18	1.64	(D) 1.07	0.08	(D) 3.23	(D) 0.24	(D) 1.66	(D) 1.99	(D) 7.17
Total revenue-car miles	1.12	1.77	(D) 1.16	1.86	0.84	1.16	(D) 1.24	(D) 1.79	(D) 5.83
Revenue passengers	(D) 0.27[1]	0.09	(D) 1.93[7]	8.24	(D) 1.84	(D) 14.62	(D) 2.90[18]	(D) 6.14	(D) 10.09[16]
Transfer passengers	1.29[2]	0.75[5]	(D) 2.80[8]	(D) 13.52[10]	1.22[12]	(D) 4.05[15]	(D) 0.19	(D) 9.31[17]	(D) 6.28[21]
Total passengers[1]	0.06[1]	0.16	(D) 2.00	7.82	(D) 2.03	(D) 13.69	(D) 2.60[18]	(D) 6.45	(D) 10.72[24]
Passenger revenue	0.51	0.10	(D) 1.26	(D) 0.16	(D) 5.97	(D) 5.37	(D) 1.73[19]	(D) 3.01	(D) 8.89
Revenue car-hours	0.53[3]	1.04[5]	(D) 2.36[9]	6.99[10]	3.21[13]	(D) 0.86[16]	(D) 2.03	(D) 2.15	(D) 7.91[7]
Passenger car-hours	0.55[3]	0.89[5]	(D) 2.65[9]	8.96[10]	(D) 0.22[13]	0.12[18]	(D) 2.01[19]	(D) 1.92	(D) 8.62[7]
Miles of single track	0.30	0.53	(D) 4.27	0.68	(D) 0.09	(D) 0.13	(D) 0.77	4.17	(D) 2.61
Passenger cars operated *a*	0.12[4]	2.15[6]	(D) 1.94[7]	5.44[11]	3.42[14]	1.03[17]	(D) 1.42[20]	(D) 1.41[16]	(D) 10.07[7]

a Average maximum number of passenger cars in service daily.

[1] Reported by 41 companies.
[2] Reported by 39 companies.
[3] Reported by 40 companies.
[4] Reported by 37 companies.
[5] Reported by 25 companies.
[6] Reported by 28 companies.
[7] Reported by 23 companies.
[8] Reported by 12 companies.
[9] Reported by 21 companies.
[10] Reported by 1 company.
[11] Reported by 3 companies
[12] Reported by 7 companies.
[13] Reported by 12 companies.
[14] Reported by 15 companies.
[15] Reported by 8 companies.
[16] Reported by 24 companies.
[17] Reported by 22 companies.
[18] Reported by 30 companies.
[19] Reported by 26 companies.
[20] Reported by 22 companies.
[21] Reported by 16 companies.
[22] Reported by 17 companies.

even operating conditions and some progress was made by certain companies in improving their situation. Their future progress depends upon the general attitude of the public toward them and the degree of sympathetic co-operation extended to them. There are signs that the peak of the public enthusiasm for motor buses was reached in the latter part of 1925 and that since then there has been a lot of sober second thought on the advantages of encouraging bus operation at the risk of jeopardizing the existence of the street railways. If this means that the problems of the latter are to receive more adequate consideration in the future, the confidence of the railways in increasing their service may be justified.

Net Income Higher.—For the nine months period ended March 31, 1927, operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $34,732,911, against $33,295,344 for a similar period ended March 31, 1926. Total operating expenses increased from $21,709,745 to $22,477,848 for nine months period ended March 31, 1927. After consideration of income deductions net in 1927 was $4,686,588 and $4,096,251 for 1926.

Chicago Surface Lines Report Increased Business in March

Total rides on the Chicago Surface Lines in March were 137,027,327, compared with 131,839,632 in the corresponding month in 1926 and 123,768,252 in February of this year. Service was increased to the extent of 432,760 car-miles, or 19,127,922 seat-miles, compared with the similar month of last year, much of the increase being in the off-peak hours to meet increased demand for service in the middle of the day and in the evening. There has been an increase in riding during the first three months of the current year of approximately 2.8 per cent over the corresponding period of 1926.

Gross earnings for the month of March were $5,334,409, compared with $5,127,371 for the similar month last year. Divisible receipts were $387,898, compared with $154,141 in March, 1926. In February gross earnings were $4,842,125 and divisible receipts were $304,380. The companies spent $687,291 during March on right-of-way, structures and equipment.

Balance in Detroit Increases

For the year ended March 31, 1927, the total operating revenue of the Department of Street Railways at Detroit, Mich., was $24,588,298, against $24,009,932 for the year ended March 31, 1926. These figures included a railway operating revenue and a coach operating revenue in 1927 of $21,999,438 and $2,588,859, against $22,895,754 and $1,114,178 respectively. Total revenue from all sources was $24,866,897, against $24,217,265 in the 1926 period. Total operating expenses were $19,007,825, against $18,231,202. The 1927 expense figure included a railway item of $16,619,335 and a coach item of $2,388,489. The 1926 total expense figure was made up of $17,132,113 for railway and

$1,099,088 for coach. Net revenue from all sources was $5,859,072, against $5,986,062 for the period ended March 31, 1926. The net income was $3,189,417, against $3,319,150. Balance for the period ended March 31, 1927, was $589,189, against $572,038. Railway passengers numbered 471,992,768 in 1927 and 492,491,738 in 1926. Coach passengers numbered 32,576,380 for the year ended March 31, 1927, against 14,827,100 for the year ended March 31, 1926. Railway revenue car-miles totaled 51,043,152 in 1927, against 54,729,579 in 1926. Coach-miles totaled 10,312,493, against 4,817,942 in the 1926 period.

Ohio Road Sold Under Foreclosure

J. P. Longon purchased the Cincinnati, Georgetown & Portsmouth Railroad at receiver's sale on April 25 for $225,000, the appraised valuation. No other bid was offered. Title will not pass to the new owners until the sale has been approved by Judge Stanley Struble of the Common Pleas Court. The sale was ordered as the result of a suit to foreclose the mortgage filed by the Union Savings Bank as trustee for the bondholders after continued failure to earn interest on bonded debt.

The C., G. & P. is a 42-mile interurban connecting Cincinnati with Georgetown, Ohio. Indications are that operation will continue under control of the new owners, said to represent the bondholders.

Disposition of Broadhead Properties Discussed

Accounting made to the court in connection with the estate of S. B. Broadhead, largely interested in the electric railways centering in Jamestown, N. Y., shows that except for two which were abandoned the lines have become self-sustaining from an operating viewpoint and now require no further advances from the estate for their operation. There have been, however, and must continue to be some substantial advances for capital expenditures such as new cars and equipment in order to render the roads successful from an operating viewpoint.

As to the Jamestown, Westfield & North Western Railroad, the report contains a large amount of operating detail but summarizes the position of the administrators as follows:

> It was realized that this road was dependent upon its freight business for its future success as the passenger business was diverted by private automobile. An appeal was made to the manufacturers of Jamestown to sustain this railroad by giving it a fair proportion of their freight. This appeal met with a substantial response, the freight revenues of the road have largely increased, a new locomotive has been built entirely in the shops of the company from old materials on hand and the company is now in position to handle large quantities of freight.
>
> It is recommended, and unless instructed to the contrary, your administrators will continue its operation until further accounting. But unless its operation yields better net results than heretofore, it will not recommend its continuance indefinitely. Permanency of operation can only follow from two things. First, substantial increase in freight patronage; second, relief from exorbitant taxation—it being assessed in nearly every tax district out of all proportion to its earning value. Effort will be directed to accomplish both.

As to the Jamestown Street Railway, the report states that the company enjoyed an increase of $25,778 in net revenues in 1926 as against 1925. The report recommends the continuance of the Jamestown Street Railway and of the Jamestown Motor Bus Company by the estates.

Rockford Property Acquisitions Expanded

Milton J. Ellis and his associates, operating the local railway at Rockford, Ill., and the interurban system, have purchased the interurban line between Belvidere and Elgin, Ill., with about 36 miles of track from Bion J. Arnold and will take over the property on May 1. The Rockford & Belvidere Railway and the Elgin & Belvidere Electric companies are consolidated by the deal and offices will be established in Rockford. Negotiations are now under way with the Chicago, Aurora & Elgin third-rail system for through service from Chicago to Freeport and this deal is said to have been favorably received by the third-rail officials. A new company will be formed to operate the line, working with $1,000,000 capitalization, which will issue $400,000 of 6 per cent mortgage bonds and $600,000 common stock. Rehabilitation of the line and establishment of freight service between Rockford and the eastern points are contemplated. Some of the eight new and fast interurban cars now being manufactured for the Ellis lines will probably be put in service on the Freeport-Elgin line.

$55,953 Added to Youngstown Value.—Value of the Youngstown Municipal Railway, Youngstown, Ohio, was increased $55,953 when the Youngstown City Council approved plans for a garage on Mahoning Avenue. The money is to purchase pumps, large storage tanks and equip a machine shop to make repairs on all buses.

To Increase Capital.—The American & Foreign Power Company, Inc., under the supervision of the Electric Bond & Share Company, has called a special meeting of stockholders for May 2 to vote on an increase in the authorized stock. This company controls railway properties in Cuba. It proposes to issue 200,000 shares of a new class of $6 preferred stock and to increase the second preferred stock, series A, to 1,600,000 shares from 120,000 shares and to increase common stock to 8,300,000 from 1,800,000 shares. Plans are being formulated and steps taken looking to the acquisition by the company of additional hydro-electric power and other utility properties in foreign countries.

Service in Peterborough Ceases.—Negotiations between the city of Peterborough, Ont., and the Hydro-Electric Power Commission looking toward the sale of the Peterboro Radial Railway System failed and service has ceased. It is claimed by the Hydro-Electric that the railway is operated at a loss of $50,000 a year. The city offered $150,000 for both railway and gas works. The price set by the Hydro-Electric is $575,000 for the two. It is believed an offer will be made to a private bus company. If the Hydro-Electric fails to operate cars for 90 days the franchise lapses and the city may take over the system.

Profit in Ogden.—A profit of $8,613 was realized by the Utah-Idaho Central Railroad, Ogden, Utah, for the period between Nov. 21, 1926, and Jan. 1, 1927, according to a report for that period made to the Public Utilities Commission of Utah. This company took over the property of the old concern, known as the "Utah-Idaho Central Railroad Company" at that time, the old company reporting to the commission for the preceding months of the year. Operating revenues of the new concern from Nov. 21 to the last of the year amounted to $78,081, while operating expenses are listed at $60,644. This left a net operating revenue of $17,437, from which taxes amounting to $8,039 had to be deducted. Non-operating income for the period was $23, which brought the gross income to $9,421. From this sum $807 interest on the funded and unfunded debt was deducted, leaving the balance noted.

Deficit in Toledo in March.—Weather propitious for walking and increased use of private automobiles brought about a decrease in patronage for the Community Traction Company at Toledo, Ohio, in March and resulted in a deficit from operations of $12,190 after caring for various funds set up in the Milner service-at-cost ordinance. The total deficit in the stabilizing fund is now $960,834.

Would Scrap Certain Lines.—The Hudson Valley Railway plans to curtail further its lines in the district of Albany, N. Y., if the stockholders and the Public Service Commission approve. The plan is to scrap the Fort Edward-Stillwater line and to do away with the Glens Falls-South Glens Falls line and the South Street railroad station line in Glens Falls. These proposals will be submitted to stockholders at a meeting in New York City on May 25. The commission some time ago denied the application for discontinuance of the Lake George-Warrensburg line and the Greenwich-Thomson line. There has been a renewal of this petition.

Gross Earnings Show Increase.—For the first time since the city of Seattle, Wash., has been operating the Seattle Municipal Street Railway system a quarterly report shows an increase in gross earnings. The financial statement for January, February and March gives the total gross revenue as $1,426,646, an increase of $1,902 over that of the first three months in 1926. The expense of operation for the first quarter of this year was $1,000,501, against $1,088,040 in 1926, a decrease of $87,539. The payroll total was $730,725, which is $85,705 less than one year ago.

Net Income Lower.—For the nine months ended March 31, 1927, passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $8,519,645, against $8,462,853 for a similar period of the year previous. Operating expenses and taxes increased from $7,226,214 in 1926 to $7,421,084 in the 1927 period. After the consideration of income deductions the net corporate income was $862,561, against a net income of $1,050,388 for the nine months ended March 31, 1926.

Personal Items

Personnel Changes Announced in Duluth

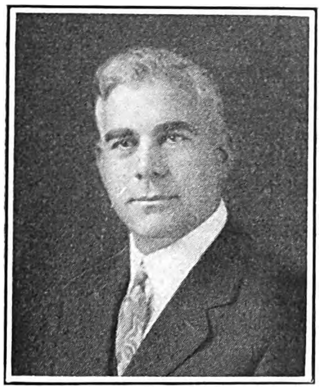
With the recent resignation of H. H. Brown as superintendent of the Duluth Street Railway, Duluth, Minn., announcement was made by Herbert Warren, vice-president and general manager, of several changes in the company's organization. W. S. Byers will be Mr. Brown's successor and B. G. Noah will fill Mr. Byers' present position as assistant to Mr. Warren. The changes are effective on May 1.

Mr. Byers, who will take charge of the superintendency of the Duluth division, has been an employee of the railway for more than 26 years. He has been assistant to Mr. Warren for a number of years and is well known throughout the city.

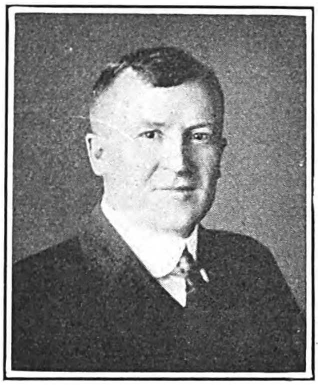
B. G. Noah, who is now a resident of Chicago, will go to Duluth on May 2 to assume his duties. He was in the employ of the Chicago City Railway and the Chicago Surface Lines from January, 1914, to February, 1917, as engineer of tests. The duties of this position consisted of making electrical and mechanical tests of substation transforming and converting equipment. In February, 1917, and up to July, 1917, he was engaged by the sanitary district of Chicago as testing engineer in charge of electrolysis mitigation. During the next two years he was in the aviation corps of the army and saw sixteen months service in France.

From July, 1919, up to the present time he has been with the Chicago Surface Lines as engineer of tests in charge of substation design and installation, his duties including the preparation of power statistics and distribution engineering. While in the employ of the Chicago Surface Lines he has also been consulting engineer for the Hammond, Whiting & East Chicago Railway. Mr. Noah completed his high school education in Kansas City, Mo., and in 1914 completed a four years course in electrical engineering at the Armour Institute of Technology.

H. H. Brown, who leaves the traction field to become associated with a large Eastern manufacturing concern, went to Duluth in 1911 as a clerk in the general manager's office. He has been superintendent since 1916 and has taken a leading part in the safety campaigns in the city. He is chairman of the statistical committee of the Chamber of Commerce safety bureau and has been on the executive committee ever since the organization of the safety division. Most of his time will be spent in Chicago.



H. H. Brown



W. S. Byers

B. G. Noah

J. A. Greig Resigns from Toledo Company

James Ashton Greig has resigned as sales manager of the Community Traction Company, Toledo, Ohio, in charge of the new commercial department. He will leave this post on June 1. At the time of his appointment at Toledo, Mr. Greig had been editor of *Electric Traction* for three years. His work in Toledo was to help secure the proper balance between production and marketing, for he had had many years of experience in railway and merchandising work.

In his early days Mr. Greig decided law was to be his calling and to study for this career he took a position with the Marconi Wireless Telegraph Company, now the Radio Corporation of America. His radio experience shifted his viewpoint to engineering and in 1913 he received his engineering degree at the University of Wisconsin. He later was employed by the Western Electric Company. Then the war came and he was assigned to Radio Company A, 89th Infantry Division. At the close of the war he went to Chicago and was employed by the Fred M. Randall Advertising Agency as merchandising manager.

Mr. Greig joined *Electric Traction* in 1922 as editorial assistant. Later in that year he was made associate editor and the following year editor.

James Ashton Greig was born in Chicago in 1892. He completed his high school work at New Rochelle and later moved to Chicago. He was graduated from Northwestern University in the course of letters and science. During his summer vacations he served as newspaper reporter.

Herbert Tuohy Assistant Traffic Manager at Springfield

Herbert Tuohy, former traffic commissioner of the Springfield Chamber of Commerce, has been appointed assistant traffic manager of the Illinois Traction System. Mr. Tuohy has offices at Springfield and Chicago, but devotes the major portion of his time to the Springfield office, in charge of W. H. Wylie, traffic manager.

Because of an extensive and varied experience in transportation and rate matters, Mr. Tuohy is especially well fitted for the new position, which is created as part of the Illinois Traction System's plan for intensive promotion of its services. The Illinois Traction System is continually entering a wider range of transportation activities, especially in the handling of through freight shipments, which requires an augmented staff of transportation experts.

Mr. Tuohy's first railway experience was gained in Peoria, Ill., where he was associated with the Rock Island, Chicago & Alton, and Illinois Central railways. In 1915 he went to Springfield, first as rate clerk and then as examiner and transportation expert for the Illinois Commerce Commission. Since 1921 he has served as traffic commissioner for the Springfield Chamber of Commerce, in which position he has been especially successful in maintaining relations between the shippers and the railways and at the same time protecting the interests of the city from a rate standpoint. During the World War Mr. Tuohy served with the A.E.F forces in France.

Amon Ing has been reappointed by Governor Baker of Missouri as a member of the Missouri Public Service Commission. His term will expire on April 15, 1933. Judge Ing was appointed to the board several years ago to fill an unexpired term.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Space Applications for Cleveland Show Ready

Applications for show space at the Cleveland convention will be mailed to all members of the American Electric Railway Association on May 16. Thirty days are allowed for filing. All applications received up to the close of business on June 15 will be awarded space by the exhibit committee, which is scheduled to meet June 22 to make the official allotment. If any space remains unsold after the initial allotment has been made, it will be assigned by the director of exhibits in the order in which applications are received.

Exhibits will occupy both floors of the Cleveland Auditorium as well as the entire new west wing. The two buildings will be connected with a covered passageway in which there will be operating maintenance of way exhibits. Track space for the display of street cars will also be provided.

Railway materials, cars, buses and bus accessories, shop tools, garage equipment, etc., will be shown as well as many other items pertinent to the transportation industry. An unusually large and varied display is expected.

Hotel circulars giving rates for the convention together with application forms for reservations have just been mailed to the membership. This is the 46th annual gathering of the association. The convention dates are Oct. 3-7, inclusive. The show opens at 12 noon Saturday, Oct. 1, affording exhibitors an additional day and a half to show their wares.

$500,000 Car Building Program in Milwaukee

With its new Burlington-East Troy cut-off scheduled for completion by midsummer and a still greater use of its Waukesha - Oconomowoc - Watertown Rapid Transit line looked for this year preparations are under way by the Milwaukee Electric Railway & Light Company to have sufficient equipment on hand to meet any demands made upon it by the public. For the present, plans in this direction include the addition of nineteen cars identical to those now in use on the Rapid Transit line to cost $442,000. All of this equipment, which will comprise fourteen motor cars and five trailers, will be built in the company's Cold Spring shops, except four all-steel motor cars which are now being built by the St. Louis Car Company for delivery in July.

Completion of the present car construction program will give the company a total of 45 de luxe cars, interchangeable from one line to another. Improvements in cars provide for the installation of treadle equipment, together with new seating and lighting equipment on 45 city cars. Conversion of these cars for one-man operation will cost approximately $117,500. With this work completed more than half of the company's city cars will be of the one-man type.

Chicago Surface Lines Adds New Automatic Sub

A new 4,000-kw. automatic substation, the first of its kind ever used on the system, has recently been completed and placed in operation by the Chicago Surface Lines on Grimm Avenue, Chicago. It furnishes power for three important cross-town lines in the north and northwest portions of the city, all formerly fed from the substation at Crawford and Ravenswood Avenues.

The new substation was built at a cost of approximately $143,000. It is equipped with two 2,000-kw., 600-volt, 60-cycle synchronous converters. The various units cut in automatically as the need for additional power is felt. The station is equipped with a high-speed supervisory control system which enables the operator at the Crawford Avenue substation, 2½ miles distant, to control both units and all feeder sections.

The erection of the substation is in line with the policy of the Chicago Surface Lines management to keep pace with demands, in spite of the handicap of an expiring franchise. The addition of 445 new cars and an increase of about 500,000 seat-miles operated in more than three years necessarily calls for a marked increase in power. Power consumed by Surface Lines operations last year was approximately 560,000,000 kw.-hr.

Metal Prices Sag in Dull Market

COPPER, lead, zinc, tin, silver and platinum were all selling on April 27 at lower prices than last week, both in New York and in London, but the lower prices are not attracting many buyers.

Copper was held at 13⅛ cents Valley delivery last Thursday, but as early as Friday at least one seller was willing to book orders at 13 cents and did a fair business during the next few days at that level, as most others were quoting 13⅛ cents. Producers' ranks gradually weakened to the 13-cent level, however, and that price was general on April 27.

Business has reverted to the quietude that characterized the market in March and no great activity is expected until the April statistics are issued about May 10. Indications are that these will be distinctly favorable and will confirm the March trend. Companies manufacturing brass and sheet copper report a continuance of excellent business, fully up to the 1926 rate, though wire business is slack. May copper seems to be pretty well contracted for; producers are well sold on this position and consumers do not seem anxious for prompt shipment. One good block of copper was sold for delivery as far ahead as July and August.

The export market has been lifeless until April 27, when the export association reduced its c.i.f. price from 13.50 to 13.35 cents, resulting in a little more buying. Most of the inquiry abroad is for prompt shipment.

CURTAILMENT IN ZINC PRODUCTION

Zinc sold at varying prices between 6.25 and 6.35 cents at St. Louis on April 21, with the largest volume at the lower limit. Since then the market has gone as low as 6.10 cents for all deliveries, at which level a fair business was done on Monday and Tuesday. Sales have been at about the same rate as during the last five weeks and well below the average rate for the year to date. Further curtailment in production is likely as ore approaches $40 a ton, $41 being last Saturday's figure; this is the logical remedy for the situation. High grade is now offered at 8 cents delivered in the East.

A moderate volume of lead business was transacted in the St. Louis market during the week ended April 27, though at definitely lower price levels, 6.55 cents being the prevailing figure since April 25. The New York market has been exceedingly dull and except for contract sales very little lead has brought the Smelting company's official New York price of 7 cents. A price of 6.55 cents in St. Louis is equivalent to 6.90 cents in New York and this is very close to parity with London for foreign ore lead.

The speculative situation in London caused a decline in tin to a low of 66½ cents for prompt Straits on April 25. Since then both the foreign and domestic markets have recovered some of the lost ground.

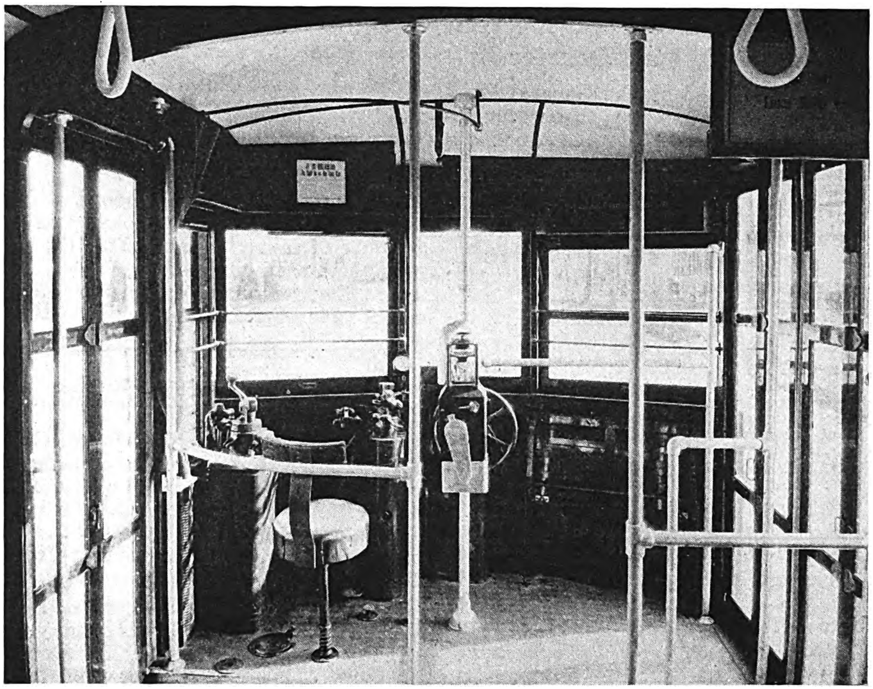
METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	April 26, 1927
Copper, electrolytic, cents per lb	12.775
Copper wire, cents per lb	15.125
Lead, cents per lb	6.95
Zinc, cents per lb	6.46
Tin, Straits, cents per lb	66 75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.475
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.25
Franklin, Ill., screenings, Chicago, net tons	2.50
Central, Ill., screenings, Chicago, net tons	2.00
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.30
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.645

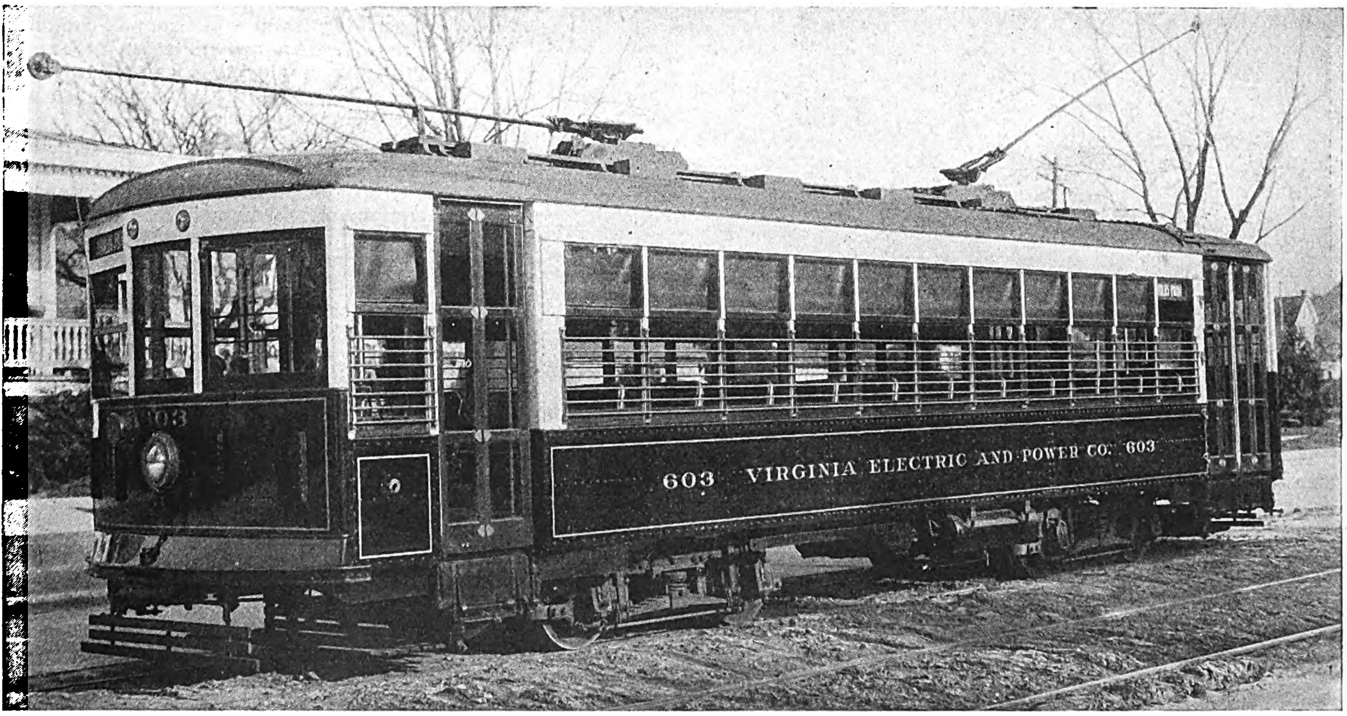
Virginia Electric Power Company Operating New Cars

As recorded in the JOURNAL for March 26, the American Car Company of St. Louis has delivered five of the ten cars ordered in December, 1926, by the Virginia Electric & Power Company, Norfolk, Va. The new rolling stock is of the closed, city passenger, semi-steel type with a seating capacity of 44. Almost immediately upon receipt the cars were put in service on the Port Norfolk and Pinners Point line of the Portsmouth division. Prior to this, the company staged a parade for the new equipment, and had as its guests City Manager Hanrahan, representatives of civic associations, and the press. The hosts on this occasion were J. Frank McLaughlin, then vice-president Norfolk division; T. Norman Jones, general manager Norfolk division, and S. J. Pope. Before the trial run and parade, an inspection was held at the intersection of High and Court Streets, Portsmouth. The trial trip was made around the Crawford Street loop, thence to Mount Vernon Avenue on High Street and return. Complete specifications are as follows:

Type of car	One-man, two-man, motor, passenger, city, single-end, double-end, double-truck
Builder of car body	American Car Co., St. Louis, Mo.
Date of order	Dec. 1, 1926
Date of delivery	March 1, 1927
Weight, total	36,000 lb.
Bolster centers	19 ft. 7½ in.
Length over all	41 ft. 8½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	11 ft. 0 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Brill
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Statuary bronze
Control	Westinghouse K-25
Couplers	Pocket
Curtain fixtures	National Lock Washer ZO
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Johnson
Finish	Enamel
Floor covering	Linoleum
Gears and pinions	Westinghouse
Hand brakes	Peacock staffless
Hand straps	Rico
Heaters	Consolidated
Headlights	Ohio Brass ZP
Headlining	Haskelite
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors	Four Westinghouse, No. 510, inside hung
Safety car devices	Safety Car Devices Co.
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Heywood-Wakefield
Seating material	Genuine leather
Slack adjusters	Westinghouse
Springs	Brill
Steps	Folding
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	U. S. No. 20
Trucks	Brill No. 177 E1X
Ventilators	American Car Co., six per car
Wheels	Standard 27 in.
Wheelguards	H-B lifeguards
Special devices	E. Minier window cleaners



Front platform showing control equipment of the new Virginia Electric & Power Company's cars, five of which were delivered late in March by the American Car Company of St. Louis. These cars were immediately put in service on the Port Norfolk and Pinners Point line



Latest city type passenger car to be placed in service by the Virginia Electric & Power Company on its Portsmouth division

$77,550,581 in General Electric Orders in First Quarter

Orders received by the General Electric Company for the three months ended March 31, 1927, total $77,550,581, compared with $86,433,658 for the same quarter in 1926, a decrease of 10 per cent.

The statement of earnings for the first three months of 1927 follows:

Net sales billed	$72,474,474
Less: Cost of sales billed, including operating, maintenance and depreciation, charges, reserves and provision for all taxes	63,641,300
Net income from sales	$8,833,173
Other income, less interest paid and sundry charges	2,838,557
Profit available for dividends	$11,671,731
Less: Cash dividends on special stock	643,587
Profits available for dividends on common stock	$11,028,143

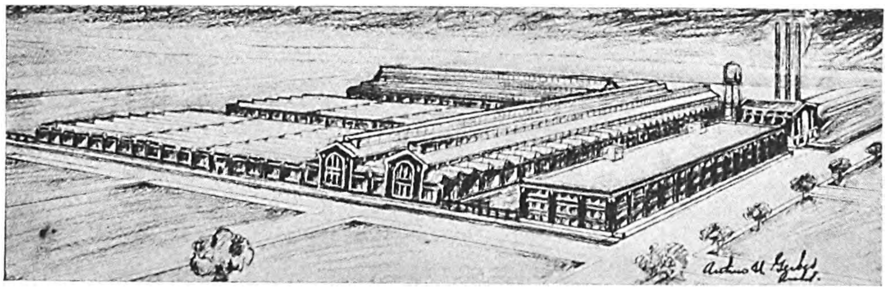
The net earnings are equivalent to about $1.53 a share on the 7,211,481 shares of no par value common stock outstanding.

$4,500,000 for Shops for Chicago Rapid Transit Company

A $4,500,000 shop construction program has been launched by the Chicago Rapid Transit Company in Niles Center, with the ultimate object of consolidating all shops in this one location.

Ten separate units covering an area of 15 acres are included in the completed project. The structures will be so laid out and connected as to afford the utmost efficiency in the handling of cars and equipment.

Construction work is now under way on the first unit of the big group, which will be one of the most complete and extensive mechanical plants in the country. This unit is the paint shop, which is 200 ft. x 224 ft. in outside dimensions. Present indications are that this building will be ready for occupancy some time in May.



Architect's drawing of new Niles Center shops

All the buildings in this comprehensive construction program have been designed with a view to making them architecturally attractive and in harmony with other structures in this suburban community. The walls are of Old English mission brick with cast stone trimmings. B. J. Fallon, vice-president, said:

> Consolidation of all the shops of the Rapid Transit lines in one convenient location is a logical step in development and expansion of our properties. When the elevated lines were brought under one management it was necessary to continue use of the various shops scattered over the city. Present requirements, however, call for a centralized plant where all work can be done with the greatest efficiency and despatch.
>
> The new shops will greatly facilitate the work of keeping our rolling stock in perfect condition and thereby increase our ability to give the people of metropolitan Chicago the utmost in safe, fast and reliable transportation service.

The present divisional shops will be used for inspection purposes and the making of minor repairs after the new plant has been completed. Provision is made for adequate expansion of the new shops as necessity arises.

Track and Line

Piedmont & Northern Railway, Charlotte, N. C., is reported as considering an extension of its electric line from Charlotte to Danville, Va. Plans call for an extension from Charlotte to Lexington, N. C., and from Winston-Salem, N. C., to Danville by way of Reedsville.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been granted the right by the City Council to build a rapid transit cut-off for a distance of ten blocks in the city limits. As part of the new work the company will relocate part of its Milwaukee-Waukesha and Watertown rapid transit line for a block south of the right-of-way, instead of along Fairview Avenue. Gates will be placed at all crossings.

Trade Notes

Chicago Fuse Manufacturing Company, Chicago, Ill., manufacturer of Union and Gem fuses and conduit fittings, announces the appointment of W. A. Wilcox as district sales manager, with headquarters at St. Louis. Mr. Wilcox will have charge of sales over southern Illinois, eastern Missouri, western Tennessee, Mississippi, Arkansas and Louisiana. Prior to this appointment Mr. Wilcox was associated with the Economy Fuse & Manufacturing Company for more than eight years.

Earl E. Knox, who for twenty years has represented Bury Compressor Company in the Pittsburgh district, has been appointed general sales manager, in full charge of sales and advertising, and will be located at Erie, Pa.

Joseph V. Smith, formerly general manager of the shovel interest of Hubbard & Company, Pittsburgh, has been appointed Pacific Coast manager for the electrical materials department of the company with headquarters at the Oakland, Cal., plant.

Pittsburgh Testing Laboratory, Pittsburgh, Pa., to serve better its many clients in the rapidly growing Youngstown district has equipped its branch there for all kinds of physical lists on engineering and construction materials. A part of the equipment is a 200,000-lb. Universal Olsen testing machine. H. L. Christman, a resident in that section for many years and well known to the manufacturing interests there, is in charge of the plant. Mr. Christman has been identified with the testing and inspection profession for more than twenty years.

Tuco Products Corporation, 30 Church Street, New York City, announces the appointment of Carl H. Kadie as successor to Frank N. Grigg, who for the past fourteen years has represented the company in the Southeastern territory. Mr. Grigg resigned on account of ill health. His successor's appointment took effect April 1.

New Advertising Literature

Sullivan Machinery Company, Chicago, Ill., has published bulletin 81-I, second edition, on Sullivan concrete breakers. It describes two types of tools, a 75-lb. or heavy-duty buster and a 48-lb. light buster. The bulletin is liberally illustrated to show different applications of concrete breakers in many parts of the country. In addition to the familiar uses, for breaking up pavement or building walls, etc., pictures are shown of busters digging a tunnel in hard sandstone, driving sheet piling, excavating slag under an open hearth steel furnace, used as a pneumatic spade for digging hard pan, breaking down a mountain of furnace slag, which rock drills would not handle, and trimming the walls of a trench for electric conduits.

Crouse-Hinds Company, Syracuse, N. Y., is mailing a decorative circular describing its new "Obround" condulets Form 7. An orange color scheme is skillfully employed to set off the various cuts. The new condulets are also listed in catalog No. 2100.

Martindale Electric Company, Cleveland, Ohio, issued on April 1 Catalog No. 8 describing its motor maintenance equipment. Among other things the catalog includes a center-page spread of a carbon brush maintenance and trouble chart.

Sullivan Machinery Company, Chicago, Ill., has published bulletin 76-G, second edition, on Sullivan electric portable hoists. Sullivan single and double drum electric portable hoists are described, together with many application pictures. The adaptability and power of these small machines, having a 6½-hp. motor, is graphically shown. The single-drum hoist is used for such jobs as car pulling, erecting steel on derricks or with gin poles, decking logs from railway cars, pulling coal cars in mines, unloading box cars with a scraper, while the double-drum unit is employed for jobs requiring two ropes such as scraper loading in mines, trimming coal piles at power plants, operating conveyor systems in coal mines or hauling sawmill refuse with a drag line and power rake.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 7, 1927 *Number* 19

Long Live Will Livelong!

FOR 30 days and 30 nights the destinies of children, pedestrians and automobilists in the city of Philadelphia have been watched over and guarded zealously by a Safety Sage of wide repute, by name Will Livelong. The month of April was dedicated to the task of insuring greater street safety. Any such ambitious program as this is always a task, due to the apparent reluctance of the average human being to be concerned with the safety of himself and his fellow men while on the highways. Undismayed by the magnitude of the undertaking, a number of agencies in the city most directly concerned with the accident problem laid out extensive plans for conducting an intensive safety campaign.

To enlist the sympathy of the public and the man in the street there had to be an appeal to his sentiment and to his logic. In the safety campaign conducted in New York several years ago this appeal was made through the mythical character "Aunty J. Walker." The campaign just concluded in Philadelphia went a step farther. As recounted in this issue, the central figure was a kindly, wise old man dubbed "Will Livelong," the Safety Sage. Being an actual person, it was possible for the safety committee to stimulate much general speculation as to his identity, and to disclose it only at the end of the campaign. This interest was built up until, when April 30 rolled around, Mr. Livelong was probably the best-known and most popular character in the city. By ascribing all safety messages and slogans to the sage, the safety committee which directed the campaign was able to take all the sting out of the warnings and to place the educational work on a plane of friendly interest rather than one of officious interference.

Results obtained from the campaign were good. Philadelphia was ripe for a concerted effort such as this, coming just when the warm spring days brought thousands of automobiles out on the streets and induced a spirit of joyous and carefree abandon in the breasts of pedestrians, young and old. The coverage of the campaign was amazing when it is considered that only $10,000 was spent. This sum, of course, covered only materials and was not used to compensate the members of the safety committee for their long and arduous labors in the cause of safety. It shows what can be accomplished when the community backing of a worthwhile movement may be obtained.

It is interesting to note that it took more than 2½ weeks of concentrated effort to overcome the momentum of the ever-rising accident toll and to start the trend downward. In the final analysis such a campaign as this is of little economic value unless its effects are fairly permanent. Encouragement is seen in the decision of the various organizations most active in the April campaign to carry on the work of safety education throughout the year. The lovable old character, Will Livelong, will probably find himself much in demand in Philadelphia and elsewhere in the months to come. As things stand now, were he politically ambitious he probably could be elected mayor!

Should Government Ownership Propaganda Be Ignored?

SOME difference of opinion seemed to develop at the recent meeting of the Southwestern Public Service Association and the Southwestern Geographic Division of the N.E.L.A. as to whether or not the utility industry should actively take the field against the threatened campaign by a radical group in Congress for government ownership of utilities. Sentiment on the part of some in the meeting was that even by attacking it, recognition was given to what is at present only a nebulous attempt to organize a movement for government ownership. Others in the meeting advocated openly attacking political ownership—for that is what it amounts to—and exposing the motives of its proponents.

There is no fundamental difference of opinion between these two groups of utility men. They both agree on the need of crushing, as one would crush a rattlesnake, this sinister threat against the security of American business through undermining its foundation of private initiative. The issue at stake is greater even than the utility industry. Political ownership of utilities would be merely the first thrust of the unscrupulous seekers for self-aggrandizement into the heart of all American business. Light and power would be only the beginning. That is the logical starting point for these champions of the "peepul," because light and power is a young and growing industry. Its very achievements, which read almost like a fairy tale, offer the necessary appeal to popular imagination for building up the story of "grasping corporations." But others would feel the attack quickly. Next would come city transportation, railroads, telephones and telegraph, coal, steel and other basic commodities, and finally business itself. What is there in favor of political ownership of the one, compared with regulated private enterprise, that does not apply equally well to all basic services and commodities and then to all business?

Ridiculous on its face? Certainly. But nevertheless the threat of a government ownership campaign has been made and the utility faces the responsibility of forewarning the public in order that it may know how to deal with those who would feather their own nests while pretending to serve the country's interest. The question is when and how? The answer is immediately by every medium that is available for reaching the public. But a word of caution is advisable. There is no issue on government ownership in this country at the present time. There is no movement under way which is worthy of recognition as such. The utility story should be merely the facts of private ownership and operation. But the time to tell it is before an issue arises.

More Recreation Makes Better Railroaders

"WE DON'T keep bankers' hours in this office" was the boast of the old-time railway executive. Nowadays sentiments of this kind are voiced less frequently. This is not because transportation men today keep "bankers' hours," whatever they may be, but rather because the thinking of the industry has changed in regard to the proper relation between work and recreation.

After all, it is not the number of hours a man puts in that counts, but the amount of work that he accomplishes. Recreation, often confused with amusement, really means a renewal of energies. To offset the severe drain on his physical strength made by concentrated efforts, it is necessary that a man have recreation, that he be "re-created" from time to time. This fact is attested by scientists, teachers and physicians. It is constantly receiving wider recognition in the electric railway industry.

Moreover, recreation presents an opportunity for making more contacts with other people. In this respect the average railway man has been notably deficient in the past. It gives him a better understanding of what his neighbor is thinking—including his attitude toward the railway. The value of personal contacts and knowledge is inestimable.

The transportation business, of course, cannot be run always on a basis of regular hours of work such as prevail in many other industries. Storms, accidents and other emergencies are bound to occur, often requiring long-continued strenuous efforts by every one before the cars are again running smoothly. Under normal conditions, however, the transportation man ought to pause long enough from his work to take regular recreation. He should regard this not as a waste of time but rather as a vital necessity.

Parking Should Be Allowed —On Some Other Street

IN EVERY city the advocates of a general policy of liberal automobile parking regulations are legion. But they do not agree as to where parking should be allowed and where it should be forbidden. Each one favors it everywhere except in front of his own door. Theater patrons want to be able to park their automobiles close by. On the other hand, the man who lives near a moving picture house objects to having his own curb lined with the automobiles of strangers. Merchants desire to encourage automobile trade by liberal parking privileges, but they are opposed to any regulations that permit vehicles to block the approach to their own stores.

The absurdity of the position taken by some of the advocates of parking has seldom been more clearly demonstrated than during a recent hearing at Philadelphia. A prominent merchant appeared before the City Council in opposition to the parking ban in the downtown business district. He declared that the merchants in his neighborhood were practically unanimous in favor of automobile parking. He admitted, however, that some time previously he had asked the Police Department to place "no parking" signs in front of his own store. His explanation was that he did not think it practicable to permit parking in front of his particular store, but that he believed it should be allowed elsewhere.

As an isolated incident the testimony of this merchant before the Philadelphia City Council is rather ludicrous. But it betrays the existence of a situation that is far from ludicrous. Too many people are thinking about traffic problems in terms of their own personal convenience. No solution will ever be found by that means. Traffic and transportation are community problems that can be solved only by community thinking—the submergence of the individual in favor of the public.

How Are We Going to Accommodate Them?

BY THE year 2027 the world's population will have multiplied itself 32 times. Such is the astounding statement of Prof. A. E. Ross, the noted University of Wisconsin sociologist. In other words, Professor Ross predicts that in that year there will be 60,800,000,000 of the *genus homo* running all over the globe. According to this authority the population of the world has doubled in the last 90 years with a birth rate of 45 per 1,000 and a death rate of only 15 per 1,000.

While, of course, most of us won't have to worry about standing room in 2027, we will, on the other hand, have to watch our step as to what we must do in the next 25 years to transport these millions yet unborn.

Seriously, this is a new angle and at the same time a powerful argument for better transportation service. How are we going to accommodate these millions that are drifting toward this globe from the land of shadows? Unquestionably, they are going to require bigger and better and more de luxe transportation; that is, if the rapid change of tastes of this generation is any criterion. What is the solution? It rationally is new cars, better cars and an unceasing study as to how we can improve our construction practices in order not to be swamped by the human deluge.

Don't let us make the mistake of laughing up our sleeves at the professor, especially when we see how the fanciful flights of Jules Verne have become common realities today. When we are prone to plan for ten years ahead when we should plan for twoscore, let's remember that 2,635 years ago Nahum, the prophet, wrote, "The chariots shall rage in the streets, they shall jostle one against the other in the broad way. They shall seem like torches, they shall run like lightning." Possibly had he been heeded instead of razzed, the steam train and the automobile would have been developed centuries ago, and maybe—who can tell—there would be no such thing as a 30-ft. street or a traffic cop.

We have the handwriting on the wall before us. We must realize that super-transportation is knocking at our doors; that in the next decade we may have four-decked streets; that every railway right-of-way will be double decked; that street cars will be operated with dining car service between the home and office; that the gigantic influx of population will demand millions of street cars, taxis, buses, private cars and airplanes; that competition will engulf us if we do not build better track, better cars; if we do not plan and develop in the super sense. All about us are frontiers to which we must bring the thin but determined line of progress. It is a great task that Professor Ross' prediction outlines for us. It will take colossal energy and the unselfish co-operation of every man in the electric railway industry.

Let's Not Ride a Willing Horse to Death

NOTABLE progress has been made recently by electric railways in securing relief from paving obligations. Five states have enacted legislation lifting this burden from the shoulders of the car riders, and many individual municipalities have made similar agreements with the companies operating within their limits. In so doing the public authorities have taken a reasonable attitude, and have shown their willingness to meet the companies half way in the solution of the transportation problem.

Because a railway has been granted partial relief, however, it should not assume that it no longer has any paving obligation whatsoever. Some of the new agreements stipulate annual lump sum payments in lieu of paving. Sometimes the obligation is to pave only a narrow strip, or merely to maintain the track pavement. But in every instance where details are available, a certain measure of responsibility for paving continues to rest on the railway.

Scrupulous care must be exercised to see that the remaining obligation is carried out. Quibbling over details, resort to technicalities to postpone execution of the work, disavowal of damage actually resulting from car operation, will serve only to make public officials regret that relief was granted to that railway. Word of it will quickly reach other localities where relief from paving burdens is under consideration. The fair-dealing company in one city may thereby be prevented by the actions of a delinquent company in another city from securing just and reasonable relief.

The Politician Is Not So Bad as He Is Painted

NOT so long ago the public relations problem of a large railway had reached such an acute stage that it was simply impossible for the utility to come to an understanding with the city council on any large question involving its right to conduct business at a profit. A change in management became imperative.

Shortly after the change things began to hum. Civic organizations went on record as favoring the company's viewpoint, the newspapers called for prompt agreement and within a few months an overwhelming majority of the councilmen passed a series of ordinances that had been hanging fire and under fire for more years of bickering than these months of harmony.

What lay at the root of the former management's failure? Poor service, excessive fares or lack of civic interest could not be blamed. The fault lay in an attitude—a state of mind. The management kept proclaiming and declaiming that all politicians were crooks; that its motto was: "Millions for defense but not one cent for tribute." It fostered the belief that the only barrier between the company and the public was the politician's itching palm.

The sequel has proved that this attitude was due to a gross misconception of the average politician's point of view. Instead of assuming that the politicians were either crooked or stupid, the new management went on the basis that they were decent human beings who simply needed a man-to-man approach instead of a shower of brickbats. Painstakingly the wants of each district were studied in association with the councilmen. Then, when an agreement was in prospect, it was possible to give to these so-called politicians a very large degree of credit for the contemplated improvements in service.

Was the Umph Street line to be extended? Yes, through the untiring efforts and ingenuity of Aldermen Snibble, it was. Were five of the new soft-cushion seated cars to go on the Woof Avenue line? Sure, Alderman Waffle's arguments had not been in vain. Would transfers be given between the trolley and the bus routes? They would be, thanks to the clarion cry of "One City, One Fare" originated by Alderman Ginpeel.

Instead of calling the aldermen harsh names, the newspapers commended them; nor have we heard that any of these gentlemen were refused re-election because they voted for ordinances that actually allowed the utility to grow and prosper in the proportion that it helped its community grow and prosper.

Another Call to Join the Art Movement

WHILE arguments fly back and forth concerning the advantages or disadvantages of standardization in industry, an exposition of Art in Trade was held in a large Eastern city from May 2 to May 7 inclusive. As a result of this effort the movement for transforming commonplace things into objects of beauty has advanced a step further and will likely add to its roster many new adherents. Although the exhibit itself was directed more particularly to home furnishings and household utilities, its purpose embraced all industries in an alliance between the manufacturer and the fine arts.

Assuming that every railway manager as an individual has a dormant capacity for art, consider how broad and varied is his field for expressing it! Take the trolley car itself, formerly a mere mechanical contrivance for carrying people, but now a transportation vehicle, in the development of which no effort has been spared to combine beauty and utility. That manager has joined the industrial arts crusade who paints his vehicles artistically as well as economically, who is an unrelenting purist in the matter of car windows, who replaces the old-fashioned hideous posters with those of artistic design, enticing the riders to travel to the end of the line; who dismisses the agent slatternly in appearance and sluggish in response and replaces him with the neat, courteous and willing salesman. In numerous other details the alert railway manager has opportunities to inject art into his industry.

If he has been slow to accept the doctrine in the past let him get back of the movement now, for industrial arts today is on a plane with the fine arts. In the words of Robert W. De Forest, president of the Metropolitan Museum of Art, New York, addressing the recent exposition, industrial arts is no longer an orphan. Though much is to be said about the standardization of industry, the individual at heart has often been a Muse, although his capacity sometimes seems latent. May this latest effort sound the tocsin to arouse laggards to a realization that, whether the product be soap or railway service, consideration of the subject of industrial arts as a potent fact in every-day life can no longer be ignored.

"Make April Safe"

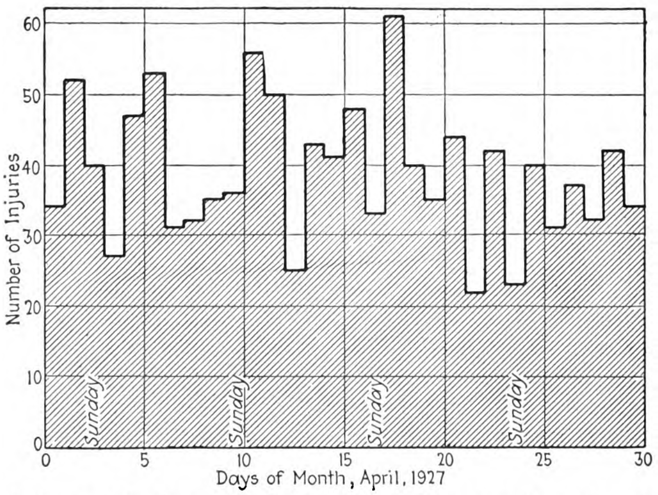
Was Philadelphia's Slogan

Under the genial sponsorship of "Will Livelong," the Safety Sage, an intensive month-long campaign was carried on to reduce street accidents—Enthusiastic support to the movement was given by all progressive elements in the community

SOMETHING out of the ordinary in safety campaigns was carried on during April in Philadelphia, when a real, flesh-and-blood character was used to typify the kindly old Safety Sage of a community movement to reduce street accidents. For a period of 30 days the quizzical glance of "Will Livelong" rested upon young and old, autoists and pedestrians, everywhere in the Quaker City. His common-sense advice and gentle admonitions were heard and seen by all but the deaf and the blind. As a result, Philadelphians were awakened to a degree of accident consciousness never before attained. Street fatalities during April, the "safety month," showed a decrease of 26 per cent from the number recorded for the same month in 1926. The rising tide of injuries was stemmed and, for a time at least, started downward once more. April was a month of intensive effort and of gratifying achievement.

Backed by the Philadelphia Rapid Transit Company, the citizens' safety committee of the Philadelphia Chamber of Commerce, the public schools, the automobile clubs, the Department of Public Safety, and numerous other civic bodies, the campaign got off to a good start on April 1. Prior to this, very definite plans had been laid out by the safety committee to carry the campaign through a number of distinct weekly phases during the course of the "safety month."

The first problem was that of finding a suitable character around which the warp and woof of the whole campaign might be woven.



Injury peak days and the general injury trend continued to rise until the eighteenth day, when a marked decline set in

By a happy inspiration the name "Will Livelong" was hit upon. To fill this rôle of a kindly old safety philosopher, an admirable choice was made in the person of W. F. Hogan, a venerable retired engineer, who, many years before, had been active in the construction of the cable and horse car lines in various sections of Philadelphia. From the very outset he was a popular and fascinating personage. No announcement as to his true identity was made until the very end of the campaign. That, however, only whetted the public taste and increased the popularity of the character.

Having established "Will Livelong" in the public eye as a character whose advice on matters of street safety was worthy of careful attention, the campaign committee proceeded with the various phases of the month's drive, always using the Safety Sage as the mouthpiece for any and all slogans and messages which were to be presented to the public.

As street accidents may roughly be divided into three general classifications, those involving children, pedestrians and general vehicular accidents, it was decided to assign a full week to a specific drive on each of these prolific sources of casualties. After a two-day introductory period, the month was divided as follows:

April 3 to 9—Children's Safety Week.

April 10 to 16—Pedestrian Safety Week.

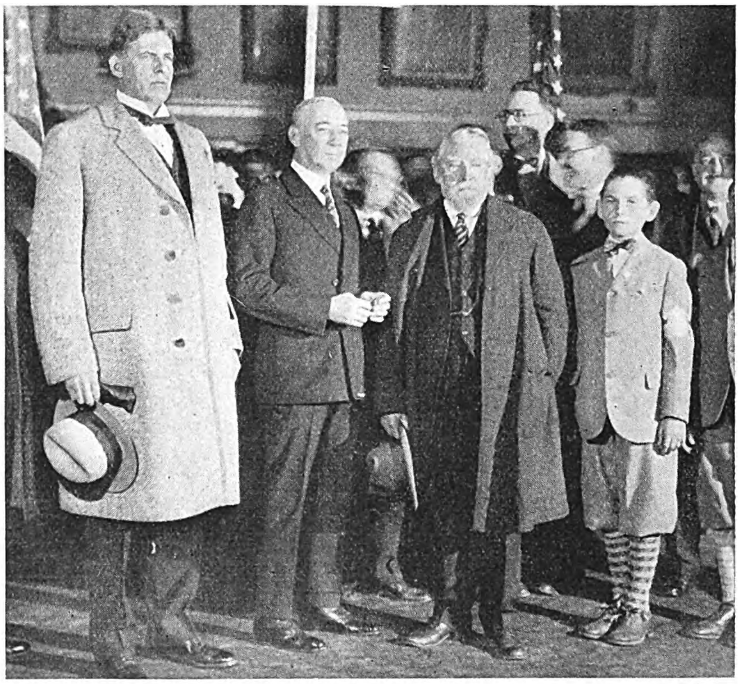
April 17 to 23—Automobile Safety Week.

April 24 to 30—A period for warring on all forms of street accidents in which to perpetuate the safety work throughout the year.

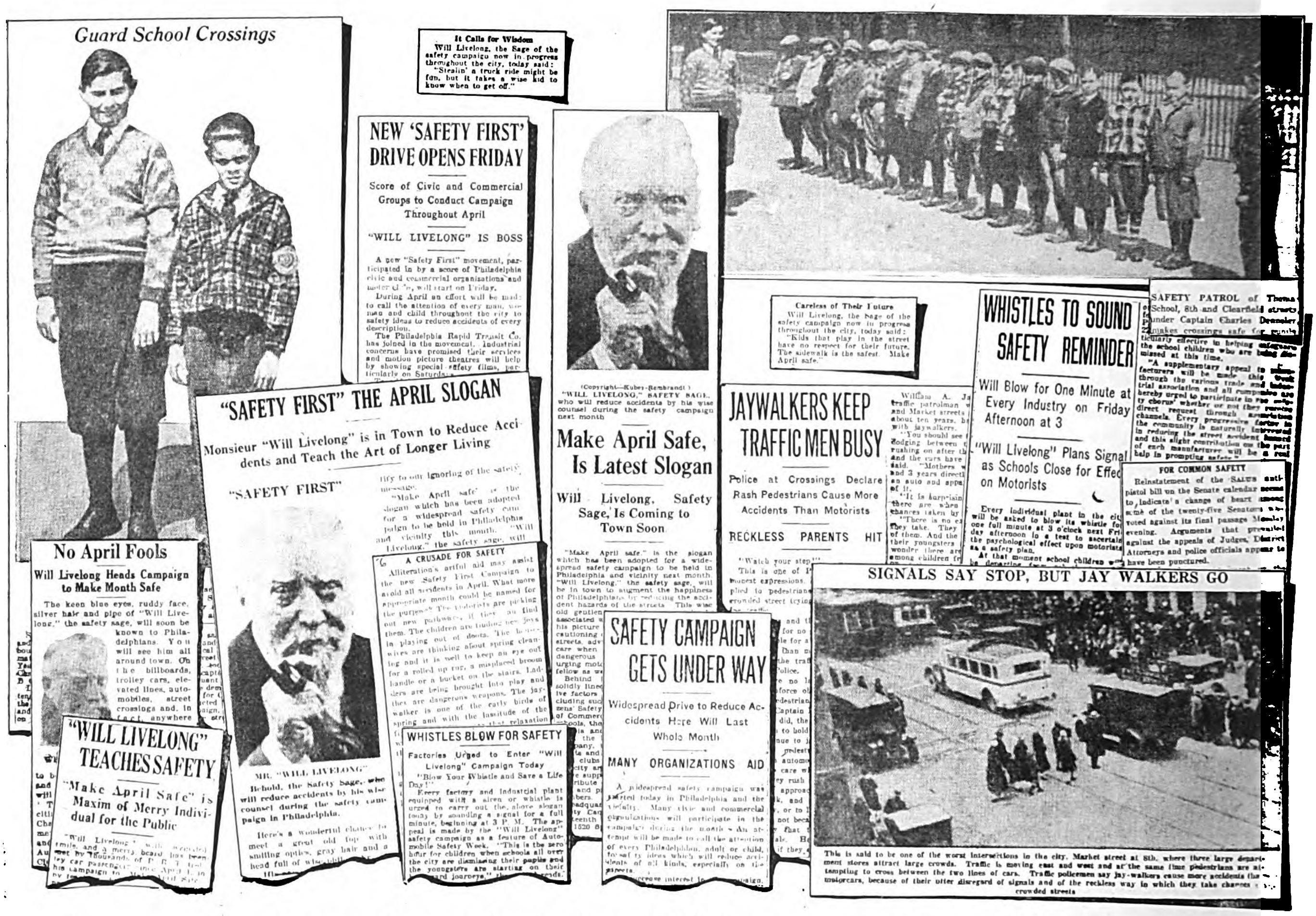
During the introductory period of two days efforts were made to line up every possible factor in the community which might be persuaded to assume some part, great or small, in helping to put over the campaign. Letters were sent to more than 250 clubs in the city asking that resolutions be voted indorsing the movement and pledging the active participation of the groups and of their individual members in the city-wide effort to reduce the street accident hazard. A meeting of newspaper representatives from the large city dailies was called and plans for the campaign were discussed with them in detail. In addition, some forty community and foreign language papers were contacted with and asked to give their full support to the general campaign, as well as to undertake a more localized drive among their own readers. It might be said here that the backing given to the safety movement by the press, particularly by the smaller community and foreign language papers, was more than gratifying.

The seven broadcasting stations of Philadelphia and station WCAM in Camden also gave unstintedly of their time "on the air" to speakers furnished by the safety committee. Equally gratifying was the assistance rendered by the moving picture and legitimate theaters. Advertising space in the programs was donated by the companies and many of the theaters used safety slides on their screens.

Each year the accident toll in Philadelphia had risen and there appeared to be real need for a concentrated effort to make the people "accident conscious." The Philadelphia Rapid Transit Company, which conceived the idea, realized, of course, that far more comprehensive results could be obtained from such a drive if it were sponsored and participated in by every factor in the community, which was directly concerned in the street accident problem, than would be possible if it were undertaken by one agency. Therefore, while the campaign was financed largely by the transportation company, an appropriation of $10,000 being set aside for this purpose, and while a major portion of the actual work of conducting the campaign was done by members of the P.R.T. organization, the company itself figured publicly only as one of the "co-operating bodies." Special letterheads were prepared, carrying the names of the principal organizations which were active in the work. Special "Will Livelong" Safety Campaign press release sheets were used in making announcements to the papers. Those employees of the transportation


A reception was held in the Mayor's office. From left to right are Fred W. Johnson, chairman of the citizens' safety committee; Mayor Kendrick and Will Livelong (W. F. Hogan)

Will Livelong was accompanied to the City Hall on the 29th by a guard of honor composed of Safety Patrol officers from the various Philadelphia schools



Guard School Crossings

It Calls for Wisdom

Will Livelong, the Sage of the safety campaign now in progress throughout the city, today said: "Stealin' a truck ride might be fun, but it takes a wise kid to know when to get off."

NEW 'SAFETY FIRST' DRIVE OPENS FRIDAY

Score of Civic and Commercial Groups to Conduct Campaign Throughout April

"WILL LIVELONG" IS BOSS

A new "Safety First" movement, participated in by a score of Philadelphia civic and commercial organizations and motor clubs, will start on Friday.

During April an effort will be made to call the attention of every man, woman and child throughout the city to safety ideas to reduce accidents of every description.

The Philadelphia Rapid Transit Co. has joined in the movement. Industrial concerns have promised their services and motion picture theatres will help by showing special safety films, particularly on Saturdays.

(Copyright—Kubey-Rembrandt.)
"WILL LIVELONG," SAFETY SAGE, who will reduce accidents by his wise counsel during the safety campaign next month

Make April Safe, Is Latest Slogan

Will Livelong, Safety Sage, Is Coming to Town Soon

"Make April safe," is the slogan which has been adopted for a widespread safety campaign to be held in Philadelphia and vicinity next month. "Will Livelong," the safety sage, will be in town to augment the happiness of Philadelphians by reducing the accident hazards of the streets. This wise old gentleman

"SAFETY FIRST" THE APRIL SLOGAN

Monsieur "Will Livelong" is in Town to Reduce Accidents and Teach the Art of Longer Living

"SAFETY FIRST"

tify to our ignoring of the safety message.

"Make April safe" is the slogan which has been adopted for a widespread safety campaign to be held in Philadelphia and vicinity this month. "Will Livelong," the safety sage, will

MR. "WILL LIVELONG"

Behold, the Safety Sage, who will reduce accidents by his wise counsel during the safety campaign in Philadelphia.

Here's a wonderful chance to meet a great old fop with smiling optics, gray hair and a head full of wisdom

A CRUSADE FOR SAFETY

Alliteration's artful aid may assist the new Safety First Campaign to avoid all accidents in April. What more appropriate month could be named for the purpose? The motorists are picking out new pathways, if they can find them. The children are finding new joys in playing out of doors. The housewives are thinking about spring cleaning and it is well to keep an eye out for a rolled up rug, a misplaced broom handle or a bucket on the stairs. Ladders are being brought into play and they are dangerous weapons. The jaywalker is one of the early birds of spring and with the lassitude of the spring and with the relaxation

No April Fools

Will Livelong Heads Campaign to Make Month Safe

The keen blue eyes, ruddy face, silver hair and pipe of "Will Livelong," the safety sage, will soon be known to Philadelphians. You will see him all around town. On the billboards, trolley cars, elevated lines, automobiles, street crossings and, in fact, anywhere

"WILL LIVELONG" TEACHES SAFETY

"Make April Safe" is Maxim of Merry Individual for the Public

WHISTLES BLOW FOR SAFETY

Factories Urged to Enter "Will Livelong" Campaign Today

"Blow Your Whistle and Save a Life Day!"

Every factory and industrial plant equipped with a siren or whistle is urged to carry out the above slogan today by sounding a signal for a full minute, beginning at 3 P. M. The appeal is made by the "Will Livelong" safety campaign as a feature of Automobile Safety Week. "This is the zero hour for children when schools all over the city are dismissing their pupils and the youngsters are starting on their homeward journeys,"

Careless of Their Future

Will Livelong, the Sage of the safety campaign now in progress throughout the city, today said: "Kids that play in the street have no respect for their future. The sidewalk is the safest. Make April safe."

JAYWALKERS KEEP TRAFFIC MEN BUSY

Police at Crossings Declare Rash Pedestrians Cause More Accidents Than Motorists

RECKLESS PARENTS HIT

"Watch your step!"

SAFETY CAMPAIGN GETS UNDER WAY

Widespread Drive to Reduce Accidents Here Will Last Whole Month

MANY ORGANIZATIONS AID

A widespread safety campaign was started today in Philadelphia and the vicinity. Many civic and commercial organizations will participate in the campaign during the month. An attempt will be made to call the attention of every Philadelphian, adult or child, to safety ideas which will reduce accidents of all kinds, especially on the streets.

WHISTLES TO SOUND SAFETY REMINDER

Will Blow for One Minute at Every Industry on Friday Afternoon at 3

"Will Livelong" Plans Signal as Schools Close for Effect on Motorists

Every individual plant in the city will be asked to blow its whistle for one full minute at 3 o'clock next Friday afternoon in a test to ascertain the psychological effect upon motorists as a safety plan.

At that moment school children will be departing

SAFETY PATROL of Thomas School, 8th and Clearfield streets, under Captain Charles Dessaler, makes crossings safe for pupils

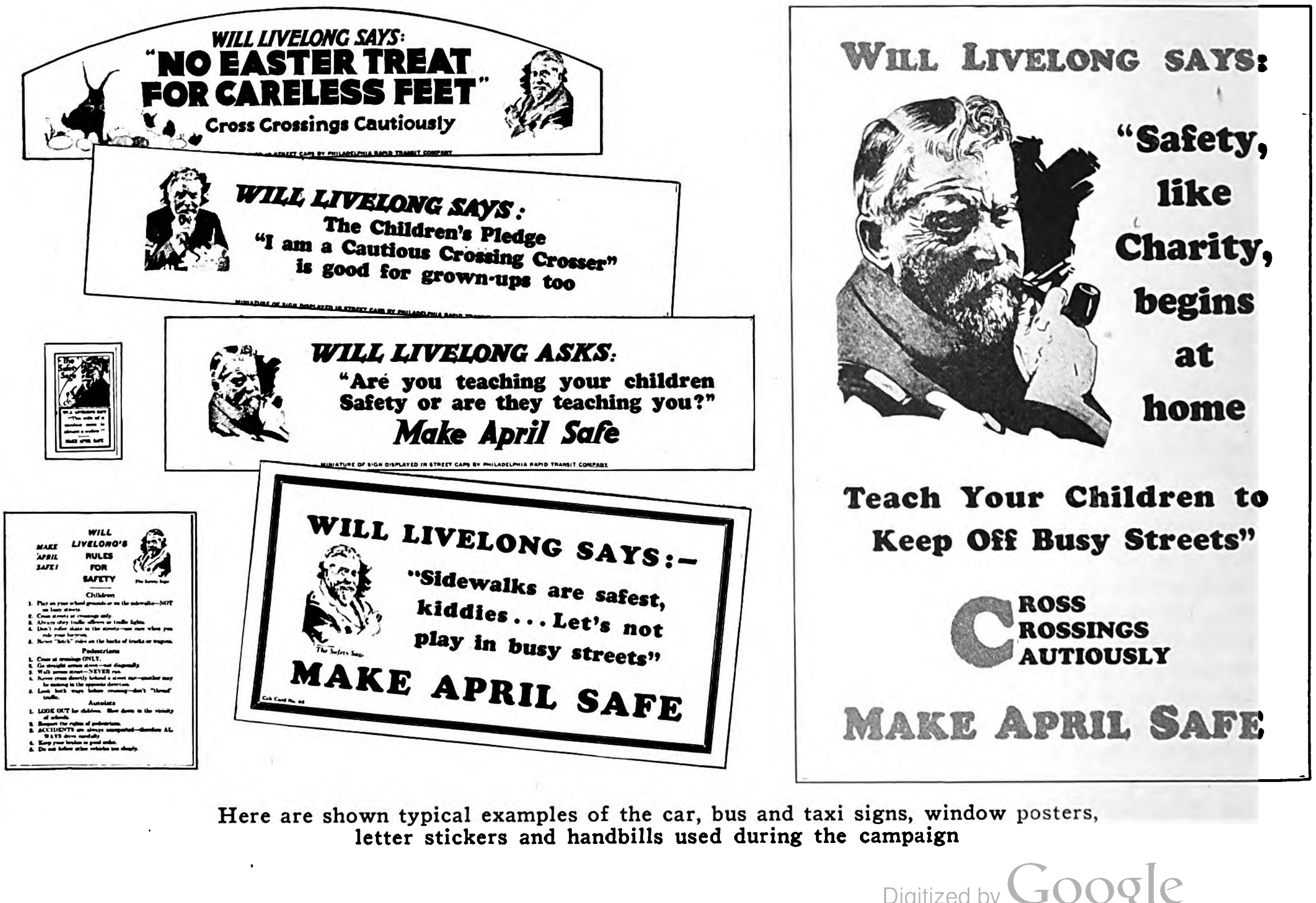
FOR COMMON SAFETY

Reinstatement of the Salus anti-pistol bill on the Senate calendar seems to indicate a change of heart among some of the twenty-five Senators who voted against its final passage Monday evening. Arguments that prevailed against the appeals of Judges, District Attorneys and police officials appear to have been punctured.

SIGNALS SAY STOP, BUT JAY WALKERS GO

This is said to be one of the worst intersections in the city. Market street at 8th, where three large department stores attract large crowds. Traffic is moving east and west and at the same time pedestrians are attempting to cross between the two lines of cars. Traffic policemen say jay-walkers cause more accidents than motorcars, because of their utter disregard of signals and of the reckless way in which they take chances in crowded streets

Hearty co-operation was given by the Philadelphia press, many stories and editorials similar to those shown above being used. The foreign language and smaller community papers were particularly helpful



WILL LIVELONG SAYS:
"NO EASTER TREAT FOR CARELESS FEET"
Cross Crossings Cautiously

WILL LIVELONG SAYS:
The Children's Pledge
"I am a Cautious Crossing Crosser"
is good for grown-ups too

MINIATURE OF SIGN DISPLAYED IN STREET CARS BY PHILADELPHIA RAPID TRANSIT COMPANY

WILL LIVELONG ASKS:
"Are you teaching your children Safety or are they teaching you?"
Make April Safe

MINIATURE OF SIGN DISPLAYED IN STREET CARS BY PHILADELPHIA RAPID TRANSIT COMPANY

MAKE APRIL SAFE!
WILL LIVELONG'S RULES FOR SAFETY

Children

Pedestrians

Autoists

WILL LIVELONG SAYS:—
"Sidewalks are safest, kiddies . . . Let's not play in busy streets"
MAKE APRIL SAFE

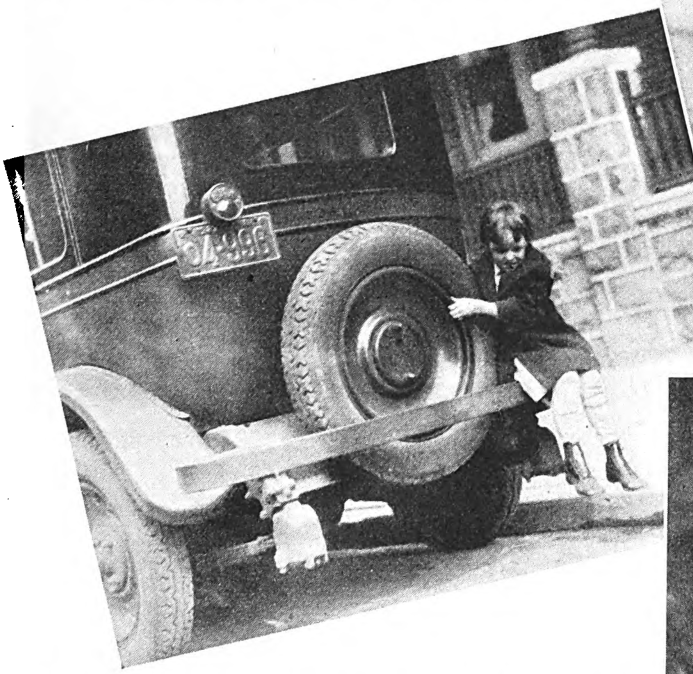
WILL LIVELONG SAYS:
"Safety, like Charity, begins at home
Teach Your Children to Keep Off Busy Streets"
CROSS CROSSINGS CAUTIOUSLY
MAKE APRIL SAFE

Here are shown typical examples of the car, bus and taxi signs, window posters, letter stickers and handbills used during the campaign company whose time was devoted almost wholly to the work of the safety campaign were in a sense temporarily divorced from the company and were simply a part of its contribution.

Representatives of the various participating bodies spoke frequently from the different radio stations and were invaluable in lining up still other organizations behind the campaign, so that it took on the aspect of a rolling snowball, ever increasing in size and momentum.

WHAT P.R.T. DID WITHIN ITS OWN ORGANIZATION

At the outset of the campaign the transportation company undertook an intensive drive within its own ranks, with a view to reducing to a minimum the total of car and bus collisions during the safety month. Its officials addressed groups of employees at the various carhouses and bus garages for several days, until complete coverage had been obtained. A special issue of the employee organ, the *P.R.T. Co-operator*, was distributed among the 12,500 men and women of the organization. In it appeared a number of safety articles. Coverage in the Yellow Cab Company organization, also operated under Mitten Management, was secured through a special safety supplement of the *Yellow Age* and by safety talks and special cab cards bearing sayings of the Safety Sage.



Probably the most widespread medium of publicity used in the campaign was the carrying of dash, bulkhead and ceiling rack signs on all of the street cars, dash signs on the buses and various types of signs on the subway-elevated cars and on the station platforms. Thus the picture of Will Livelong and his various messages were carried into every section of Philadelphia and into many of the outlying communities. They were seen by literally millions of people, and also, of course, had a distinct psychological effect upon the P.R.T. employees as well.

Safety posters were used on all of the company bulletin boards. Weekly reports on the per cent reduction in car collisions were also posted, so that the men might know what results were being shown by their own efforts.

As a result of this intensive work inside the company, an excellent record for reductions in car and bus accidents was established during April. There were fourteen less collisions in April of this year than there were in the same month in 1926. This was a reduction of approximately 30 per cent.

ASK ANY AMBULANCE DRIVER WHAT HE THINKS OF RECKLESS MOTORISTS

Left and above—Pictures such as these were used in the papers and in the schools to show children how not to play. At right—These two rubes, "Will Livelong's Country Cousins," distributed safety buttons and handbills on the downtown streets for several days

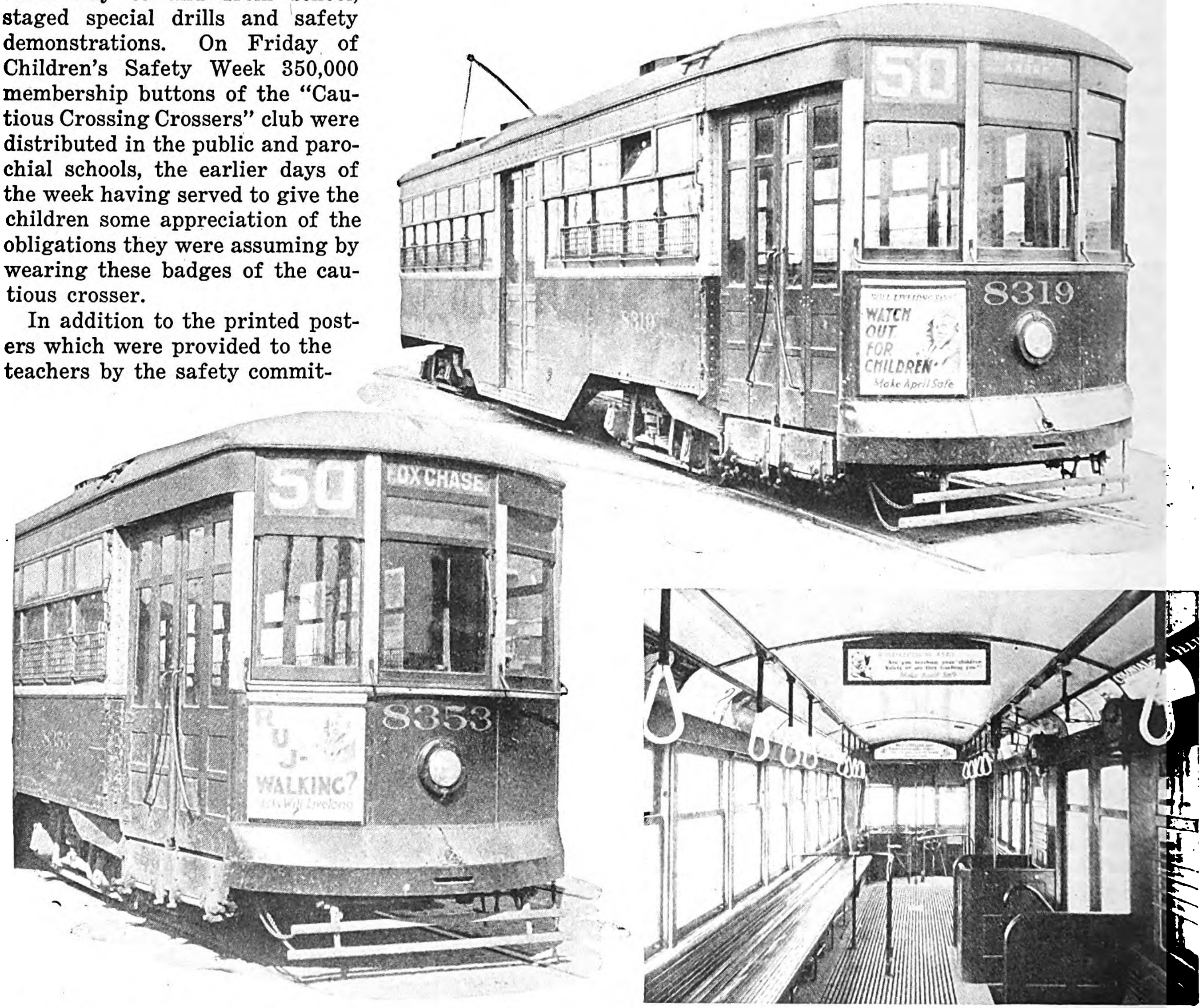
Fleet owners who operate large numbers of trucks were urged by the citizens' safety committee to conduct safety educational campaigns among their drivers, since a large proportion of vehicular accidents occur through the carelessness of non-owner drivers. Many companies, thus solicited, co-operated very effectively in the work.

CHILDREN'S SAFETY WEEK ACTIVITIES

Through the whole-hearted co-operation of the public and parochial schools and the organized safety patrols, the attention of practically every child in the city was focussed on the matter of street safety during the week April 3 to 9. Talks by members of the safety committee were given before assemblies and individual classes in many schools. In the English, drawing and penmanship classes special emphasis was placed on exercises which would further encourage the observance of rules for safe conduct on the streets.

The Safety Patrols of the various schools, composed of picked groups of older boys whose duty it is to safeguard the street intersections while children are on their way to and from school, staged special drills and safety demonstrations. On Friday of Children's Safety Week 350,000 membership buttons of the "Cautious Crossing Crossers" club were distributed in the public and parochial schools, the earlier days of the week having served to give the children some appreciation of the obligations they were assuming by wearing these badges of the cautious crosser.

In addition to the printed posters which were provided to the teachers by the safety committee, pupils were encouraged to submit designs and slogans of their own, the best of these being sent in to the campaign headquarters and duly acknowledged by a representative of Will Livelong.



Dash, bulkhead and ceiling rack signs were used on all of the street cars and subway-elevated trains. With each weekly phase of the campaign the text of the signs was changed

PEDESTRIAN SAFETY WEEK

During Pedestrian Safety Week, April 10-16, intensive efforts were made to reach as many individuals as possible among the Philadelphia public by means of radio talks, addresses before luncheon clubs and other groups, newspaper publicity and a widespread distribution of printed safety rules. These latter consisted of five specific rules for children's safety, five for pedestrians and five for autoists. Speakers before groups of business men took supplies of these printed rules with them, as well as safety window posters, and the business men were urged to make use of this material among their patrons to as large an extent as possible. Eighteen thousand window and bulletin board posters and more than 50,000 printed safety rules were distributed during the month.

All of the street cars and buses of P.R.T. carried dash signs bearing the slogan "'R U J Walking?' asks Will Livelong." Since the foolish actions of J-Walkers are sins of the individual rather than of the group, as is of course true of children's and automobile accidents as well, the appeal to avoid pedestrian accidents was directed wholly at the individual. He was reminded that he is endangering the happiness of his dear ones, as well as his own well-being, by taking unnecessary chances on the streets.

AUTOMOBILE SAFETY WEEK

During this week the Keystone Automobile Club and the Automobile Club of Philadelphia were particularly active in bringing to the attention of their members the appalling toll of vehicular accidents in Philadelphia and throughout the country. The point was emphasized that a very large proportion of these accidents might be eliminated by exercising proper care in operating vehicles, by according ordinary road courtesy to the "other fellow" and by sacrificing a few moments of time in order to safeguard not only the driver but also all other users of the highway.

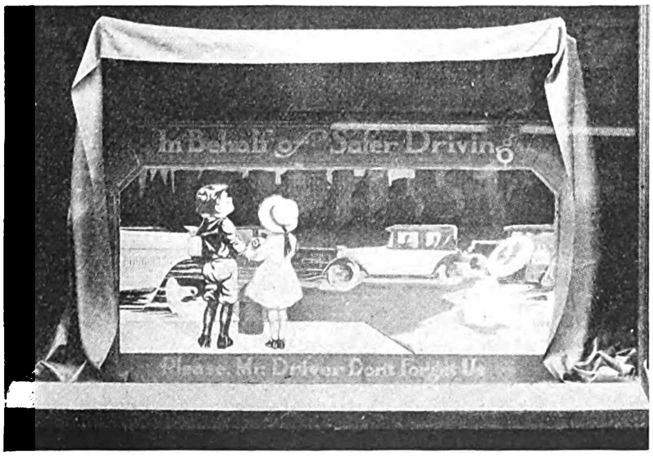
As an attention-attracting stunt two men dressed as rubes and plainly labeled as "Will Livelong's Country Cousins" distributed "Cautious Crossing Crosser" buttons and the printed safety rules throughout the center of the city for several days during the week. These men also attended the opening ball game at Shibe Park between the Athletics and Yankees, as well as the game on the day following, and distributed large quantities of safety material to the thousands of fans present.

Friday, April 22, was designated as "Blow-a-Whistle-and-Save-a-Life Day." Requests were sent to 3,600 factories and industrial plants in and around Philadelphia asking them to blow their whistles or sound their sirens for one minute at exactly 3 p.m. on this day. The purpose of this "safety chorus" was to remind the autoists of the thousands of children being dismissed from their schools at this hour, and to remind the children to exercise the necessary care while crossing streets. An excellent response was made by the various industrial plants and very favorable comment was received from the press and from individuals who wrote in to express their interest and sympathy with the movement.

FINAL WEEK

As an opening gun in the closing week, Sunday, April 24, was designated as "Safety Sunday." All members of the Philadelphia clergy were requested to mention the subject of street safety from their pulpits on this day. Bible classes, young people's organizations and similar discussion groups in the churches were also asked to give consideration to the problem of insuring to a greater degree street safety. So interested were the ministers that a number of them requested information concerning the procedure to be followed in establishing Safety Patrols in their church schools as an extension of the excellent work carried on by the public school patrols.

With a view to building up public interest in the announcements of Will Livelong's real identity on April 29, all radio talks and other talks before clubs and groups of children during this week were worded to stimulate curiosity on this point. It was announced that Will Livelong's 74th birthday would be celebrated on April 30 and all were urged to show their appreciation for his work in making the streets safer by sending him birthday greeting cards. A large number of these cards were received, showing that Philadelphians generally were glad to do him honor upon this auspicious occasion.


In Behalf of Safer Driving
Please, Mr. Driver, Don't Forget Us

Many different types of window displays were used in store windows to emphasize the safety idea

KEEP HIM DOWN!
I AM A CAUTIOUS CROSSING CROSSER

Cuts, electros and mats such as these were sent to the co-operating newspapers. More than 350,000 of the buttons were distributed

On Friday, April 29, Will Livelong made his first public appearance when he called at the City Hall to meet Mayor Kendrick. He was escorted there by a guard of honor, composed of Safety Patrol officers from various of the Philadelphia schools. Representatives of the various co-operating bodies were also on hand at the reception by the Mayor and they were officially thanked for their contributions of time and effort in helping to put over this community movement.

April 30, the closing day of the Safety Campaign, was also the opening day of Boy Week. The activities of the two movements were to have been smoothly merged by having 250 safety banners and signs carried by marchers in the Boy Week parade. A driving rain on the 30th made it necessary to postpone the parade until the following Saturday, May 7. However, the safety banners and signs were to be used just as had been planned for the earlier date. As a further tie-in between the Safety Campaign and the Boy Week activities dash signs on half of the street cars and buses during the closing week of the Safety Campaign bore pictures of a typical boy and the phrase "Boy Week April 30-May 7, Be His Pal. Will Livelong says: 'Keep Him Safe.' "

A tie-up in another direction was made with Clean-up Week. The other half of the cars and buses carried dash signs which stated " 'Rubbish Causes Accidents. Clean Up,' says Will Livelong."

GENERAL PUBLICITY FEATURES OF THE CAMPAIGN

Safety stickers carrying a picture of Will Livelong, the Safety Sage, and the phrase "The wife of a careless man is almost a widow. Make April Safe" were printed in large quantities and distributed to hundreds of stores and other business firms throughout the city for use on their outgoing mail and packages during the month. Press releases, mats of safety cartoons and electros of Will Livelong's picture were sent to newspapers, house organs and local magazines. The Stanley Company of America and other news reel companies sent photographers to the safety demonstrations and to the Mayor's reception to Will Livelong. These pictures were shown in the downtown and community theaters and added much to the interest of the campaign. The *Evening Bulletin* ran a daily series of sayings by the Safety Sage and the other papers also co-operated quite extensively by means of news stories, editorials and photographic displays. The city of Philadelphia did its share by supplying radio and school speakers and by instructing its police officers to be particularly vigilant in insuring the safety of all users of the highways during the month.

DEFINITE RESULTS FROM THE CAMPAIGN

As shown in the chart on page 806 the trend of the accidents during the first 2½ weeks of the campaign continued slowly to rise. Following the two preliminary days, the toll of injuries for the four weeks was 265, 299, 277 and 239 respectively for the four weeks of the campaign. Following the high record of the second week, the reduction in the third week was in sharp contrast, but the number of injuries in the fourth week was far below previous records. It is significant that so long a time is required to arrest this ever-mounting accident toll by even the most concerted of efforts on the part of the whole community. The peak occurred on April 18. Then the trend took a downward path, and it is probable that this continued decrease in street accidents will continue for some length of time after the close of the campaign proper. In the matter of fatalities, as well, the record achieved during April was exceptionally gratifying. From a total of 30 fatalities in April, 1926, the number was reduced to 22 for the same month this year.

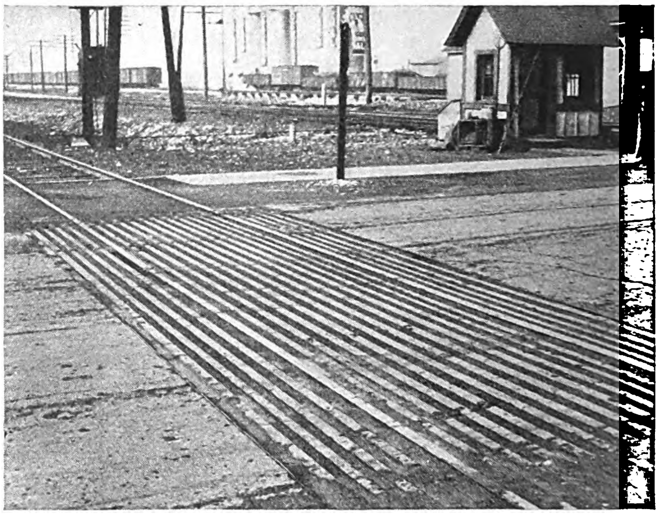
Durable Highway Crossing Made of Old Rail

By S. CLAY BAKER
Engineer Maintenance of Way East St. Louis & Suburban Railway
East St. Louis, Ill.

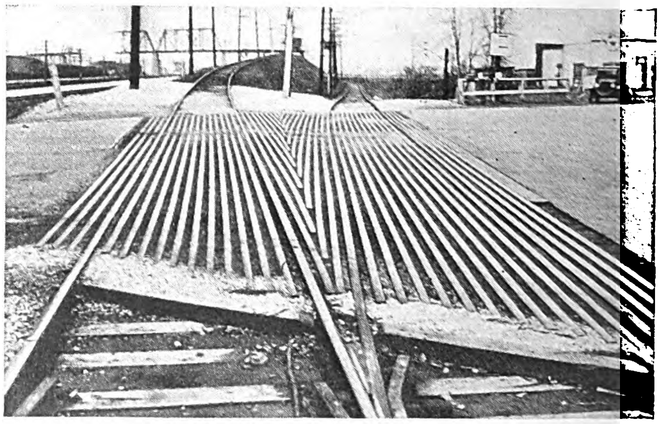
WHERE state highways and other heavily traveled routes intersect the lines of the East St. Louis & Suburban Railway a great deal of trouble has been experienced in maintaining suitable crossings. During the days of light vehicular traffic, the old-style plank crossing or track filled with fine macadam was satisfactory. Provided frequent inspections and repairs were made the plank had a long, useful life. A macadam crossing was economical and serviceable, although it required frequent inspection and refilling.

Since the advent of heavy automobile traffic, however, the life of a plank crossing has been substantially shortened. Moreover, good quality plank has become scarce and expensive. The macadam crossing nowadays requires constant attention to be kept filled. With either of these types it is difficult to maintain a smooth riding crossing and avoid complaints from automobilists resulting from broken springs, etc.

To solve the problem thus created brick and granite paving were installed at some intersections between the rails and outside the rails to connect with the highway pavement. These types are expensive and it has been found difficult to make a satisfactory installation with the T-rail used. Finally, it was decided to construct a crossing of old T-rail of the same height as the running rail. In building this crossing the track was brought to grade about 1 in. above the surface of the concrete pavement. Lengths of old rails were then set on the ties between the running rails and outside of them. They were placed as close together as possible, leaving space only for spikes between. After this had been done the spaces between the rails were filled with fine macadam. This type of crossing is somewhat more expensive than the types formerly used, but after completion requires practically no maintenance. It is favored by the highway officials. Two crossings of this type have been in use for two years and have given satisfactory service.



Standard right-angle highway crossing along the lines of the East St. Louis & Suburban Railway. Old T-rails in 30-ft. lengths were laid on the ties between the running rails. The intervening spaces were filled with fine macadam



Acute angle crossing at a junction of two heavily traveled state highways was built by cutting and beveling the old rail with an acetylene torch

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Co-operates in Improvement Work

THE Puget Sound Power & Light Company, Olympia, Wash., is removing all poles from the main downtown streets to alleys and side streets. The company is also co-operating with the city in paving streets between its tracks, although its franchise with the city does not call for paving. More than $50,000 has been spent in paving.

Determination of
Ton-Mile Freight Cost

By A. B. Cole
Commercial Consultant, Pittsburgh, Pa.

Factors to be considered in rate making. Analysis of the units of cost in electric freight transportation. Consideration of principles for allocation of expenses between passenger and freight operating service

WHAT is my ton-mile cost? No doubt this question has come up from time to time in the mind of practically every electric railway freight operator in the country. It is an important operating fact which he should know in order to determine correctly and intelligently whether or not his freight operation is paying.

With the modern methods of electric railway accounting in use, practically all data for determining the ton-mile cost may be found in the files of the public utility, when supplemented by the intimate operating knowledge of the official in charge. It is the intent of this article to outline the procedure followed in determining the ton-mile cost on an electric railway property, as well as especially to emphasize the important operating elements involved. While these latter may at first seem known to all, the interpretation given in this article is to bring out particularly certain operating fundamentals.

Transportation, as we know it, is well defined in the words quantity times distance, as expressing the work done, or

Transportation = Quantity × Distance,

and since we have two kinds of transportation we have

Freight Transportation = Tons × Miles

and

Passenger Transportation = Passengers × Miles

The basic units for transportation, then, are the ton-mile and the passenger-mile, and while each is a true measure of the kind of transportation to which it refers, neither of its individual factors alone is a measure.

It is in these units, fundamentally, that transportation is sold to the public, but in the case of freight transportation, the sale is expressed in a slightly different manner.

The average revenue ton-mile is an exceedingly variable unit, when one road is compared with another, and even on the same road when the record of one year is compared with that of previous years. This last statement is particularly true when we consider the factor which determines how the ton-miles may vary in an infinite number of ways. This factor is the kinds of commodities offered for transportation. They are almost innumerable, and each kind of commodity could have a rate of its own at some time or other. Of course, the number of classifications is being constantly reduced wherever possible, but a uniform classification, while used by some electric railways, is not only impracticable, but impossible from the standpoint of good business.

The first consideration in rate making is the character of the freight to be handled, and this in turn means a charge according to its value, and particularly all that a specific traffic will legitimately and fairly bear. Thus, in rate making, we have to consider:

1. Cost of service to perform the work required.
2. The competition present.
3. The value of the service performed, as compared with the value of the freight to be handled.

The all-important question of fixing transportation prices is usually determined by two or all of these factors, one of them being dominant at one time, and another factor at another time.

While carload freight is a very desirable kind to handle, the profit of such business depends obviously on the commodities to be transported in bulk.

The electric railway is an important carrier of short-haul and less-than-carload freight, and this class of traffic brings a higher rate than the same freight offered in carload lots. This less-than-carload service involves terminal expense and should pay more than service not involving such expense. Moreover, practically all electric railway freight movements are equivalent to express service at freight rates.

With the ton-miles unchanged, the average ton-mile revenue will be increased by anything that tends to decrease the number of large shipments and increases the number of small shipments of the same class of freight.

With character and quantity of the freight equal, it will be found that the transportation charge varies more or less with the distance an article is carried. Obviously, the longer the haul the greater the carrying cost per ton, but the additional cost does not vary directly with the additional mileage. Thus, interstate commerce is governed by the so-called long and short-haul clause which forbids a greater charge for a longer haul to the same point than for a shorter haul. Other things being equal, we find the charge per ton-mile will vary inversely with the length of haul.

Therefore, it readily may be seen that the revenue per ton-mile is the product of many variable factors, and in determining the cost of transportation, it is reasonable to assume that the rates or prices of transportation have been previously settled.

Running trains (one car or many) on a railway is the only way transportation can be produced. Thus, train-distance (train-mile) is the unit of transportation service done by a railway.

In practically no industry is the unit of service ever the unit of production. Thus, the ton-mile may possibly represent much more work done on one road than another or upon the same road at one time than another, and the energy necessary for its production is by no means constant. Thus, the unit of railway service must have factors corresponding with those in the unit of production, which have been shown to be

Tonnage or quantity × miles or distance.

But how is this tonnage or quantity obtained or carried? By a car or train, either single cars or motor cars and freight trailers, multiple-unit trains or cars hauled by a locomotive? All are conveyances of service. Therefore a good "unit of service" is provided by:

Conveyance × distance = train-miles.

Why should not the car-mile be considered as the unit of service? This is a logical question, since so much freight in many localities is carried by single-car trains. The car-mile cannot be used alone but must be converted into train-miles, which represents service done by:

1. Motor car or locomotive.
2. A definite number of trailers or freight cars, plus a caboose when used.
3. Train crew.

In producing the train-mile, the quantity of energy tends to be constant; while that spent per car-mile (where train or locomotive operation) does not vary considerably without any variation in the work done.

A large amount of preparatory work must be done on any railway system before the production of transportation begins. This usually is switching and making up trains in yards or at terminals, which may be called switching or work mileage to distinguish it from revenue train-mileage. Thus train-mileage is best measured by the number of miles train crews actually travel from point to point.

PRODUCTION OF TRANSPORTATION

Transportation is produced only when a railway makes revenue-ton-miles, for only then does it start to earn money. As previously indicated, a great deal of work must be done by a railway before it can begin to produce units of service, train-miles, and this work cannot be measured in train-miles. This work includes:

1. Terminal service and switching.
2. Maintenance of way.
3. Repairs to the entire railway plant (buildings, shops, machinery) and other items governed by different factors than those governing transportation.

From this, it will be seen that the unit of service, the train-mile, cannot be looked on as the complete unit of service, or possibly as a unit of cost. In each unit of service there are usually a great number of units of transportation, and the determination of the cost of these is very complicated, as it includes many factors that are not materially interdependent. Despite all of this, the whole theory of transportation depends on the cost per unit of transportation sold.

Since a railway performs work almost universal in character apart from the actual furnishing of transportation, there exists no opportunity to use a single "unit of cost" in the transportation business. Thus there are two main divisions of work done:

1. Revenue train-miles, and
2. Work preparatory and complementary to production of train-miles.

Therefore, the operating expenses may be divided into those (1) directly incurred by producing revenue train-miles; and (2) those not directly incurred. Thus it will be seen that the expenditures of an electric railway may be divided into four general classes:

A. Actual production of transportation, the unit of which is the revenue train-mile.

B. General direction, clerical work, and supervision, measured in per cent of total revenue.

C. Collection and handling of freight and passengers at stations, terminals and intermediate points, with the units, ton and passenger.

D. Maintenance and operation of the whole railway plant, not dependent upon the movement of trains. The unit for this class of expenditure is the mile of track.

After these are established, a division of expenditures between freight and passenger operation becomes necessary to determine the cost and profit of the ton-mile and the passenger-mile. Preferably this allocation should be made as the expenses occur. Where this has not been done previously, *A* and *D* may be divided according to train-mileage (where locomotives are used, "locomotive-mileage should be added); while the proper proportion between *B* and *C* depends on the relative amounts required by freight and passenger operation.

The next step is to apply to these expenses the units of cost already mentioned, thereby getting the following units for freight expenses: (1) Cost per freight train-mile, in cents; (2) cost in per cent of freight revenue; (3) cost per ton, in cents; (4) cost per mile of track, in dollars. In further considering the cost per freight train-mile, it must be remembered that this all-important unit is dependent upon: (a) Cost of power (delivered at the rail); (b) equipment maintenance; (c) maintenance of way; (d) train service, including supervision; (e) loss and damage.

IMPORTANCE OF TRAIN-LOAD

Thus it is evident that the most important element in the ton-mile cost is the relation between the number of ton-miles carried and the number of train-miles run, which means the revenue freight train-load.

The train-load is the supreme factor in determining the cost of the ton-mile, as well as the profit in the production of transportation. It thus becomes the one factor above all that makes for economical railway operation. The train-load determines a greater proportion of the ton-mile cost than all the other factors put together.

The train-load is governed by: Character of tonnage; condition of equipment; condition of permanent way, and vigilance of the management.

There are four important units of railway expenditures and an approximate method of properly prorating the expense between freight and passenger operation. From an electric railway report containing detail operating data it is possible to determine the principal units of cost. Thus a value may be found for the freight train-mile, for the handling of a ton of freight at stations and terminal points, for the maintenance of the fixed part of the whole railway plant or system and for the relation between general expenses and general revenue. The total of the ton-mile costs (in cents), of each, gives the average ton-mile cost for the whole system, as these figures would represent the average result of all business done by the electric railway.

It will readily be seen in the division of expenses that those under *B*, *C* and *D* are not necessarily affected by the ton-mile, and do not tend to uniformity of ton-mile cost, for there is only a very loose and general connection between the number of ton-miles carried and expenditures for maintenance of permanent way, buildings, etc., or between the number of ton-miles and the expenses at terminals, stations, etc., or between the number of ton-miles and administration expenses. But there is a general connection, predicated on the fact that a road needs so much plant (road as a whole) and so much general force to do about so much business.

As the ton-mile is a measure of revenue, and a road can afford to spend only so much for these last three classes of work, there should be approximate uniformity in the ton-mile cost for these items. Of course, in the train-mile expenditures, no such relation exists.

To effect economies in ton-mile cost in *B*, *C* and *D*, the expense must be considered by itself, apart from the ton-mile.

Generally speaking, money is not wasted by electric railways in manufacturing train-miles, but there is often a great deal of waste in the use of train-miles once they have been produced. Distinct recognition of this fact would produce a great saving on both electric and steam roads.

Therefore, in order that the electric railway man may estimate his ton-mile cost he should know:

1. Cost per average train-mile (expenses in *A* divided by the train-miles).
2. Average proportion of expenses in *A* to all freight expenses.
3. Average proportion of freight expenses to freight revenue per ton-mile.
4. Average proportion of empty car-miles.
5. Freight train density (ton-miles, divided by miles operated).
6. Train-loads (ton-miles, divided by freight train-miles).
7. Tonnage per car yearly.

What many electric railways operating freight service need to do is to increase the density of their freight business, in order to make the factors that are valuable in determining economies in ton-mile cost effective. For, as the density of business decreases, these factors become relatively less valuable, and as business is increased they tend more accurately to measure and regulate the cost.

It will be noted from what has been said, that after having established the four main units of railway expenses and allotting expenses between freight and passenger operation, this discussion has related primarily to freight operation. However, the same methods may be followed in determining the cost per passenger-mile, after the proportions in *A*, *B*, *C* and *D* chargeable to freight and passenger operation respectively have been determined. Thus, the units of cost in passenger expenses may be applied as follows:

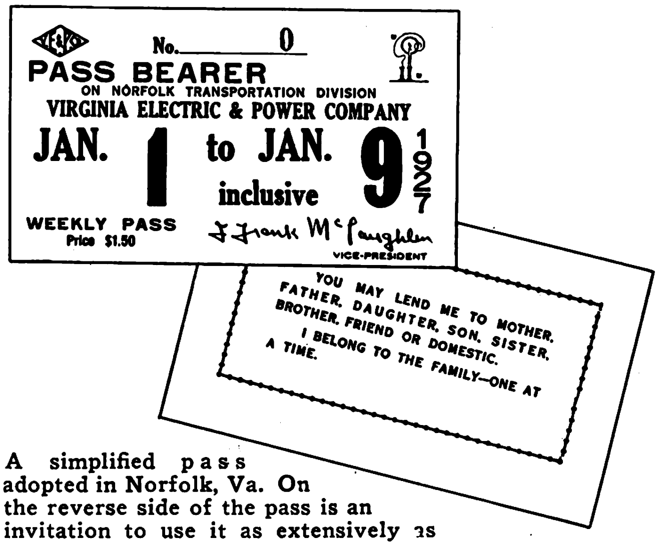
A = Cost per passenger train-mile in cents, based on the use of one or more cars per train.
B = Cost in per cent of passenger revenue.
C = Cost per passenger in cents.
D = Cost per mile of track in dollars.

Simplified Pass Form in Norfolk

SIMPLIFICATION of a weekly pass was accomplished by the Virginia Electric & Power Company, when this form of transportation was inaugurated for its Norfolk lines on Jan. 1 of this year. A complete reversal of the old policy of putting rules and regulations and restrictions on the face of transportation tickets has been effected. The first tickets, reproduced in the illustration, were printed in green on white ticket paper, except for the date reading "January 1 to January 9 inclusive," which appeared in red.

Instead of cluttering up the back of the ticket with restrictions and notices of penalties, there is a plain invitation to use the pass, written in the second person.

This pass, which sells for $1.50, is one of the three types of fares in use on the property, the two others being a cash fare of 10 cents and a ticket fare of 8¾ cents, four for 35 cents. This new fare schedule was started on Jan. 1, and supersedes the old fare of 6 cents on buses, 6¼-cent tickets and 7-cent cash fare on the cars. The zone fares existing prior to this last change have been eliminated and the entire system is now included in a single zone. The same fares apply to both buses and cars and transfers are given to passengers changing between them.



No. 0
PASS BEARER
ON NORFOLK TRANSPORTATION DIVISION
VIRGINIA ELECTRIC & POWER COMPANY
JAN. 1 to JAN. 9 1927
inclusive
WEEKLY PASS
Price $1.50
J. Frank McLaughlin
VICE-PRESIDENT

YOU MAY LEND ME TO MOTHER, FATHER, DAUGHTER, SON, SISTER, BROTHER, FRIEND OR DOMESTIC. I BELONG TO THE FAMILY—ONE AT A TIME.

A simplified pass adopted in Norfolk, Va. On the reverse side of the pass is an invitation to use it as extensively as possible

It will be noticed that the first pass is good for nine days, the extra two days included in the first period being necessary to reconcile the Sunday-to-Sunday pass with the fare change which took place on Saturday, Jan. 1. This was utilized as a "bargain day" feature to encourage buying the pass for the first week of its existence. The pass form is an evolution of that used first in Jacksonville.

Chicago Extends Construction of Concrete Loading Platform

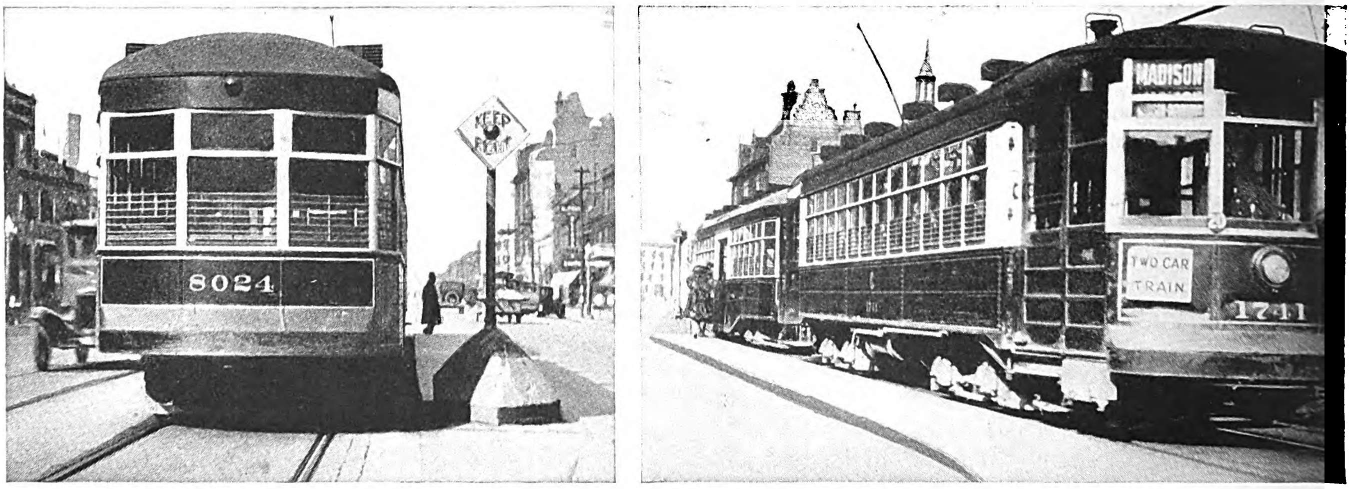
Experience with Sample Installations Leads to Adoption of This Safety Feature as Part of Street Improvements—Bulkheads and Flashing Signs Add Safety

By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines

SATISFIED with the first installations of concrete loading platforms on wide car line streets, the city of Chicago will include similar facilities for the convenience and safety of surface car riders in more than 7 miles of street improvement this year. These permanent loading platforms were introduced in Chicago last summer on more than 3 miles of street in two sections of the city.

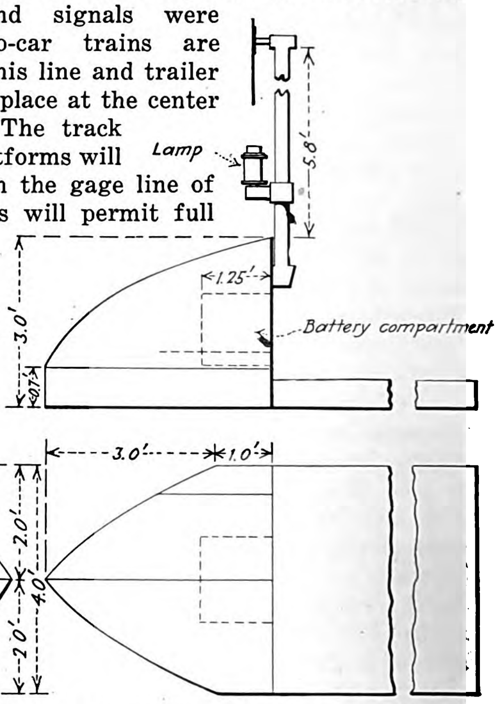
Eight months use has brought wide approval from both motorists and car riders. Vehicles can pass loading street cars and car riders are given protection while boarding and alighting. Elevation of the safety zone above the street level affords a clean, dry, walking surface. A platform width of 4 ft. permits easy movement to and from the cars.

The first group of these safety islands was built with ends sloping to the street level. At many locations on the up-street end of these platforms reinforced concrete bulkheads have been built and mounted with flashing "Keep to the Right" signs. Power for illumination is furnished by a battery located conveniently in the bulkhead and above the street level. With only slight changes, this measure of protection will be included at all locations, built according to the new design.



Concrete bulkhead and flashing signs increase safety of Chicago loading platforms, which are long enough to accommodate a two-car train

The accompanying drawing includes the principal dimensions of the platforms except over-all length. This has been determined by the type of equipment to be used on each line. Platform length of present and proposed installations is given in the accompanying table. Safety islands previously installed on West Madison Street were constructed 73 ft. in length at intersections where bulkheads and signals were placed. Two-car trains are operated on this line and trailer loading takes place at the center of the car. The track side of the platforms will be 33 in. from the gage line of the rail. This will permit full use of the loading zone without danger of being brushed by the moving cars.



A battery carried in a compartment in the end bulkhead is used to illuminate the concrete platform. The length of the structure varies with the type of equipment operated

DATA ON RAISED CONCRETE LOADING PLATFORMS IN CHICAGO

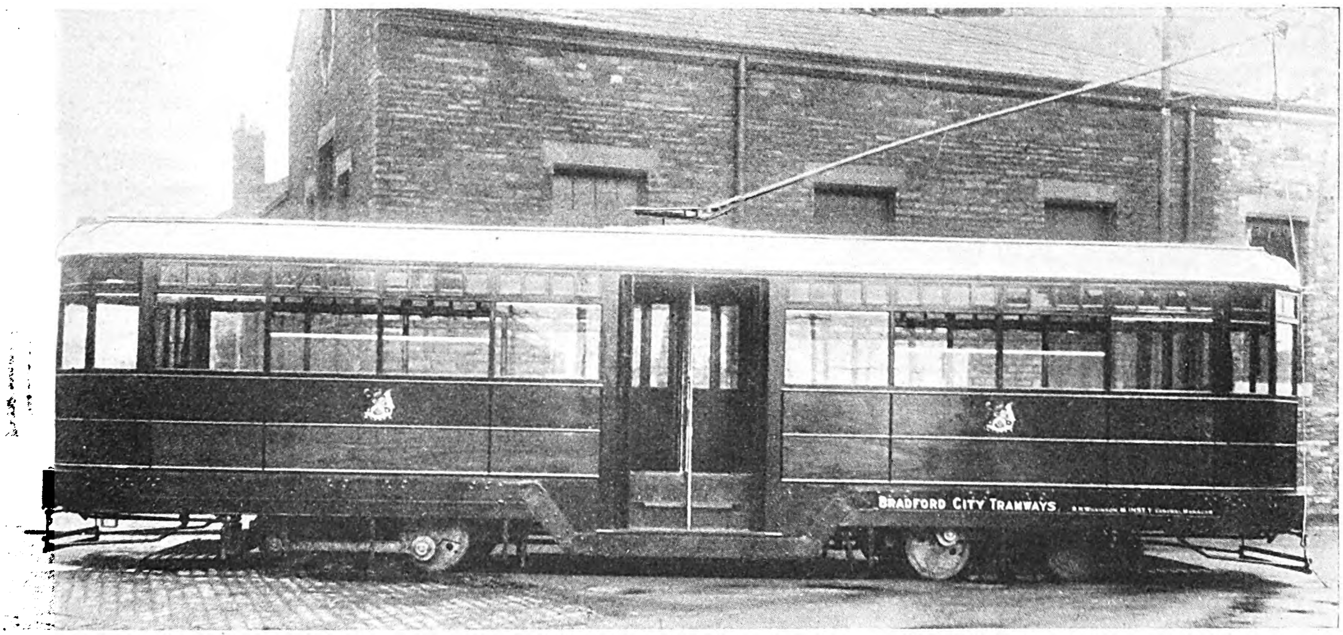
Car Line	Roadway Width, Feet	Number of Plat-forms	Length of Plat-forms, Feet	Bulkhead and Signal
1926 Installations				
Clark Street	94	13	70-80	Without
Madison Street	80	41	70-90	Part with and part without
To Be Installed (During 1927)				
Ashland Avenue	70	44	100	With
Western Avenue	70	31	100	With
South Chicago Avenue	60	11	100	With
Milwaukee Avenue	78	32	100	With

When built as a part of street improvements the first cost of these raised loading platforms is small, and when maintenance comparison is made they are expected to show economy over many types. This improvement has been designed by the Bureau of Streets of the city of Chicago in co-operation with the Chicago Surface Lines.

Acknowledgment of the important position and permanent nature of street railway transportation in Chicago is shown by this expenditure for platforms to give greater convenience and protection of street car riders.

British Car Designed for Quiet Operation

Single-deck, double-truck vehicle built at Bradford has two 63-hp. motors spring suspended from the car underframe. Remote axles are driven by propeller shafts



Bradford new worm-drive car with side guards removed to show connecting rods

PROGRESS in local transportation methods lately has been following two parallel lines in England. On the one hand there has been an extension of bus operation by the tramway managements, while, on the other hand, notable improvements have been made in rail car design. The latest step taken in this direction has been the construction of a high-speed, single-deck, worm-drive car for the Bradford Corporation Tramways.

Permission to undertake extensions of bus operations has been sought by more than twenty municipalities at this session of Parliament. Among the cities making application for wider bus use was Bradford, Yorkshire, the home of the woolen trade. Its application was the first to be acted upon by Parliament when, on March 3, it was turned down by a large majority.

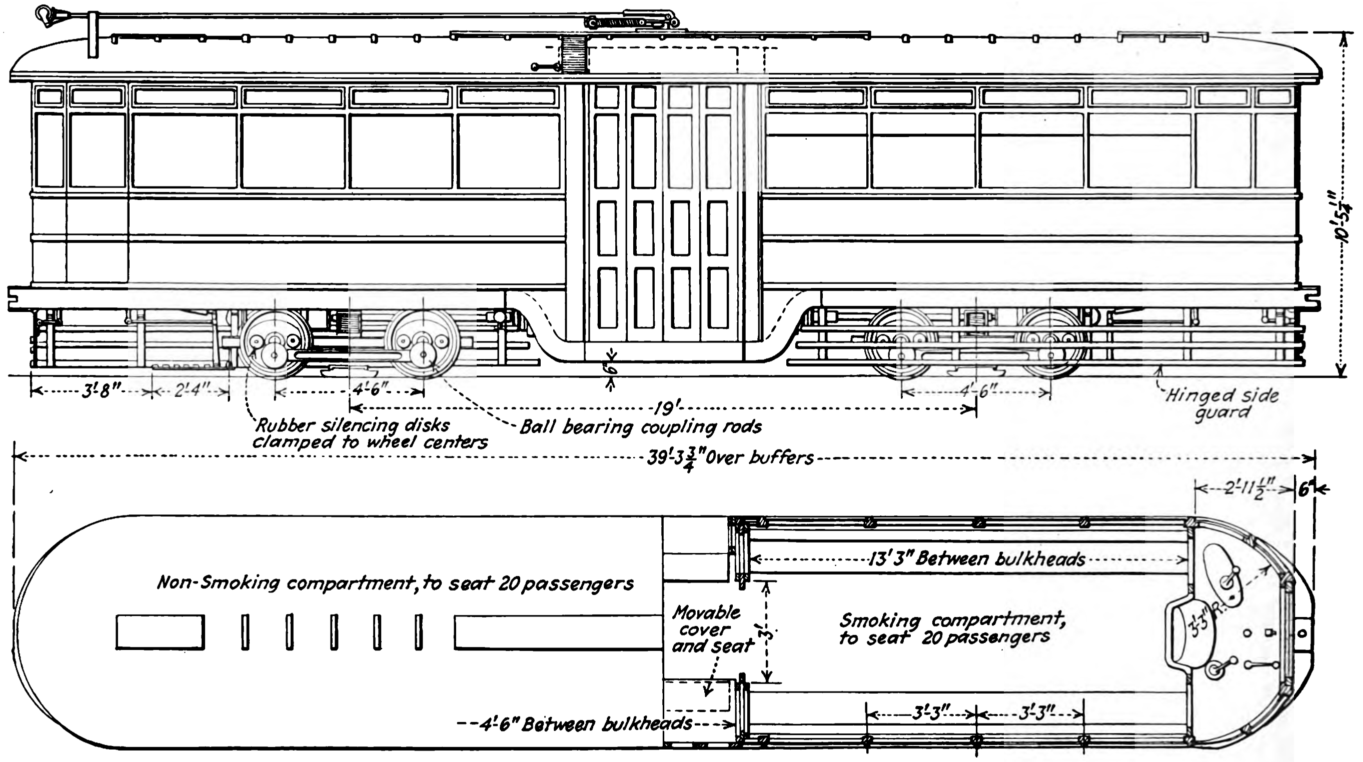
General Manager R. H. Wilkinson of the Bradford Corporation Tramways, however, had not put all his eggs into one basket. While the arguments for bus extension were being heard before Parliament, he designed and built a new type tram car with which to compete against the independent bus operators if the municipality was refused permission to operate its own buses. Like a good general, he chose carefully his time for springing this surprise. On the day preceding the parliamentary debate concerning buses Mr. Wilkinson startled the inhabitants of the city of Bradford by personally operating his new car on a trial run through the city.

The standard type car used on this system is a double-deck vehicle, rather noisy and slow. Thus the appearance of a single-deck car traveling at high speed with practically no noise was a genuine surprise. Yorkshire sat up and took notice. Newspaper men haunted the streets in the hope of getting a second view, for at first glimpse they had been too much surprised to snap the shutters of their cameras. Others called in a body at the Thornbury depot, where the car had been built, to get particulars. One and all were disappointed, however. It was not until some time later that the management was willing to divulge details concerning its construction.

The outstanding feature of the new car is the location of the two motors, spring suspended from the underframe. Each motor drives the remote axle of one truck through a flexible propeller shaft and worm gear. Wheels on the other axles of each truck are driven by connecting rods.

The motors are rated at 63 hp. and weigh 1,340 lb. each. This is only about 21 lb. per horsepower, a considerable reduction from usual British practice. The motors are series wound and specially designed by the English Electric Company to eliminate hum. Indications are that noise has been reduced to a marked extent. Dick-Kerr controllers are used, the only departure from standard practice being an arrangement for field shunting on the last notch.

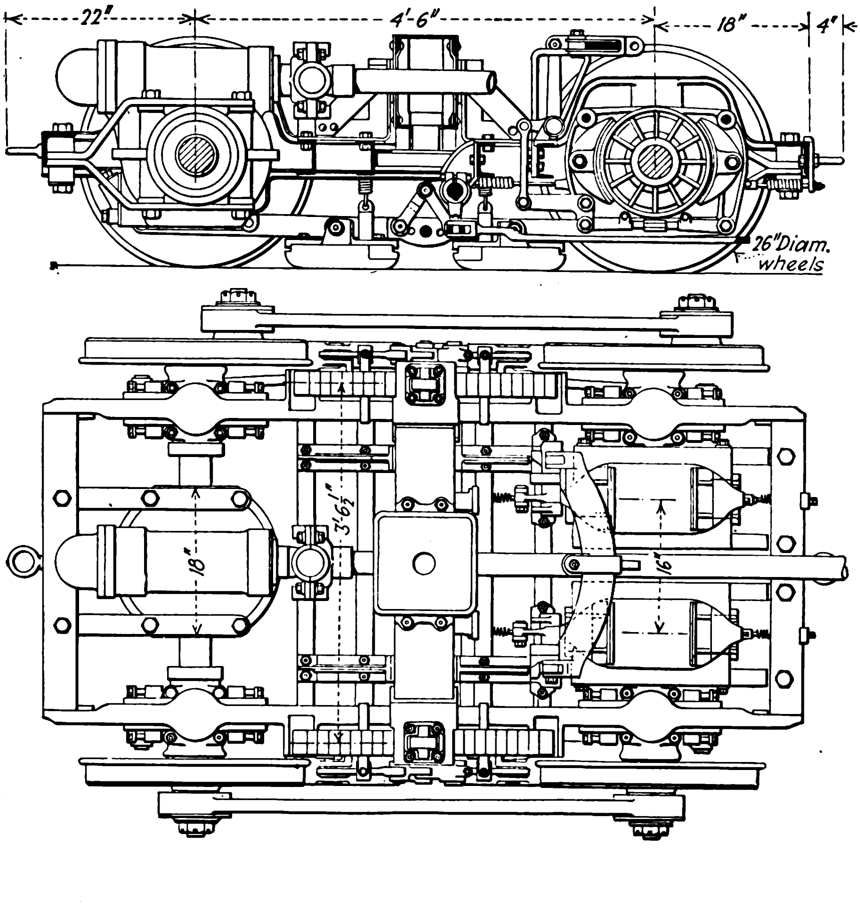
Connecting rods operate on ball bearings around the crank pins. Journal bearings are inside the wheels, which are of 26-in. diameter. The wheels are counterbalanced to prevent hammering on the rail on account of the eccentric weight. Axles are of high tensile strength steel, slightly tapered, as shown in an accompanying drawing.

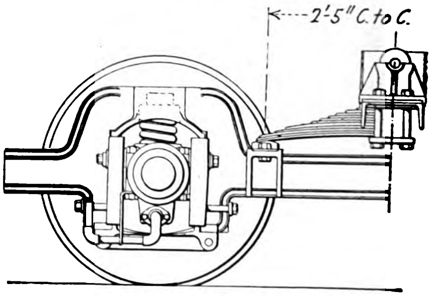

10'-5¼"
3'-8"
2'-4"
4'-6"
9"
19'
4'-6"
Hinged side guard
Rubber silencing disks clamped to wheel centers
Ball bearing coupling rods
39'-3¾" Over buffers
2'-11½"
6"
13'3" Between bulkheads
Non-Smoking compartment, to seat 20 passengers
Movable cover and seat
3'
Smoking compartment, to seat 20 passengers
3'-5" R.
3'-3"
3'-3"
4'-6" Between bulkheads

Single-deck, center-door arrangement of new Bradford car is a novelty in British tramway practice

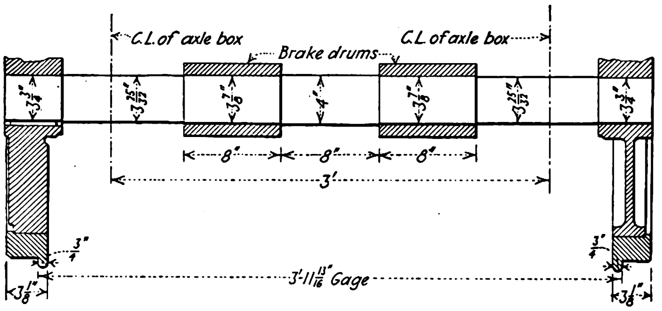
The truck frame is of 8-in. x 3½-in. rolled steel sections. Trucks are spaced 19 ft. between centers. The wheelbase of each truck is 4 ft. 6 in. It has been found by experiments that the car can negotiate a curve of 29-ft. radius without difficulty. The drive from the motor to the axles is through a propeller shaft with Spicer universal joints at each end. The worm is of steel and the worm wheel of phosphor bronze. A gear reduction of 5¾ to 1 is provided.

Spring arrangements are extremely simple. Each truck is equipped with two longitudinal semi-elliptic springs bearing on plain shoes. There is also one transverse spring, as shown in an accompanying drawing. Plain journal bearings with ordinary oiler pads are provided. Side thrusts are taken on a phosphor bronze washer between the wheel and the axle box. The center bearing consists of a rubber buffer, in the center of which is a phosphor bronze molding tube. The rub-


22"
4'-6"
18"
4"
26" Diam. wheels
18"
3'-6½"
16"



Above, details of semi-elliptical spring arrangement. At left, details of braking and driving mechanism



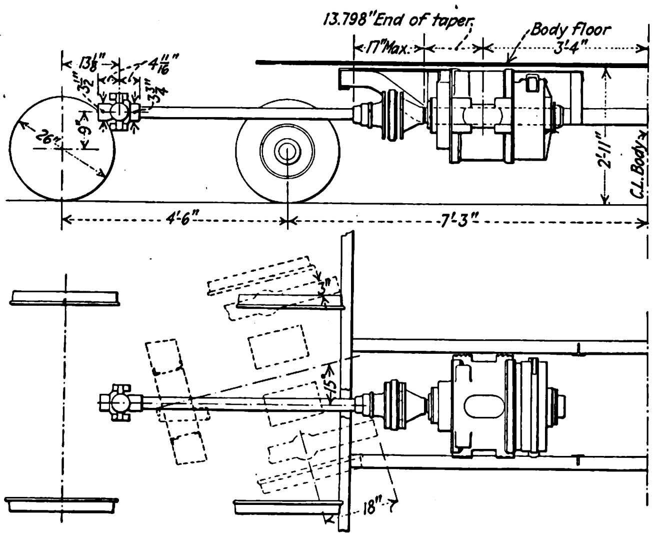
Assembly of inner axle showing brake drums which are placed in position before the wheels are pressed on

ber buffer cushions all shocks, while a loose phosphor bronze thrust washer at the bottom takes care of any downward thrust.

Straight air brakes are provided as well as hand brakes of the usual type. The air brakes are fitted with asbestos-lined shoes, pressing on two cast-iron drums mounted on each of the inner axles. This arrangement is shown in an accompanying drawing. For cooling purposes each brake drum has an interior vane. Eight outlets are provided for sand, one alongside of each wheel.

The length of the car is 39 ft. 3¾ in. over buffers. The width is 6 ft. 10½ in. at the belt rail and 7 ft. over the roof. Natural grain mahogany is used for exterior finish, while moldings, etc., are painted dark red. The roof is white. Entrance and exit are by means of double folding center doors. These are pneumatically controlled by the motorman and are interlocked with the control.

Three low steps give access to the center vestibule. The side members of the underframe are bent downward to form a well on each side. When the doors are closed hinged flaps drop into position at the floor level, making half of the vestibule always available for standees. Seats are provided for 34 passengers and it is estimated that 26 more can be comfortably accommodated standing. Seats are upholstered in red leather. The interior finish is mahogany. The ceiling is of birdseye maple finished in natural grain. Pale green linoleum covers the floor. Single-stroke bells operated at 500 volts are provided for communicating with the motorman.



The motor is spring suspended from the underframe and connected by a flexible propeller shaft to the outer axle. Dotted lines indicate position of wheels on the curve of 28-ft. radius

This is the first car of its particular type to be operated in Great Britain, although certain of the individual features are not altogether new. Single-truck cars with worm drive are in use in Halifax and Hull. Experiments have been made with single-deck cars in Glasgow and elsewhere. It is expected by the tramway management that the comfortable fittings of this car, its high speed and quiet operation will give it a popularity equal to or greater than that of its bus competitors.

Light Metal for Car Construction in Europe

EUROPEAN, as well as American, car builders are turning their attention more and more to the use of light-weight alloys in car building. There is no doubt that demand for the use of such materials in automobiles and their necessity in aircraft have assisted in the development of light-weight alloys and their use in car construction, where appreciable savings in power are gained with the reduction of every pound in weight of the car. From a review of the situation in Germany in a recent issue of *Verkehrstechnik* the following is taken:

There are now available two types of light-weight alloys, each of which has a distinct range of application: "Aeron," "skleron" and various modifications of "duralumin" represent the high-grade alloys, suitable for stamping, rolling and forging, with strength comparable to machine steel, and "silumin" and "cetal," which lend themselves to castings, but having only about one-half the strength of steel. Pure aluminum castings have only one-quarter of the strength of steel.

These alloys are from fifteen to twenty times more expensive by weight than steel, which makes it obvious that the ratio of material cost to finishing labor cost is of much less importance than with steel. Even if the alloys are used properly and the weight of a given piece is reduced to one-third or one-fourth of an equivalent steel construction the material cost is still six times as much. A very considerable reduction of the material is therefore essential. This can be accomplished with the high-grade alloys and relatively simple shapes to such an extent as to cut the over-all cost in half. Wherever possible, high-grade alloys should therefore be chosen, while castings are in order only for complicated pieces. Car framing members and panel sections call, therefore, for aeron or skleron, while hardware parts and fixtures should be made of silumin castings. The latter should be considered as an equivalent of steel castings or forgings, but it has the advantage of much lighter weight and the possibility to shape it by bending or rolling.

When the high-grade alloys are used as girders, closed U or box sections are recommended, and the sides of these members can be perforated with holes to save material. Beading the edges of these holes helps greatly to strengthen the girders. Attention must always be paid to the fact that these alloys are much softer than steel. A hammer blow will leave a much deeper mark, a key is more liable to work loose and come out, a bolt in an oversized hole will soon pound the hole to a much larger diameter where the structure is one subject to shocks, etc.

Nevertheless, by the use of these metals the weight of a 54-ft. steam railroad car was reduced to one-half of that of a steel car. Where steel or iron is also used a direct metallic contact between the alloys and the steel or iron must be avoided to prevent dangerous electrochemical destruction.

One of the greatest advantages of light-weight alloys is their much greater ability to absorb energy when subjected to shock. This is due to their small elastic modulus, which is only one-third that of steel, so that if a car, made substantially of these alloys, runs against an end stop, its main sills will compress lengthwise three times as much as if of steel. The impact energy, of course, varies with the square of the speed, according to the formula $KE = \frac{1}{2}mv^2$. To give a practical example based on a 15-ton alloy car, such a car operating at a speed of 14 m.p.h. can hit an end stop without more damage to the car than would be met by a similar steel car weighing 30 tons, at a speed of 6 m.p.h. Aluminum alloys are therefore about equal in strength to steel, but have a much larger capacity to absorb energy.

"Dress-Up" Day Sponsored by Cleveland Southwestern

With every motorman, conductor and station agent attired in a new uniform of dark gray whipcord, with gilded buttons, the Cleveland Southwestern Railway & Light Company, operating approximately 200 miles of track between Cleveland, Wooster, Mansfield and Bucyrus to the south, and Elyria, Oberlin and Wellington to the west, observed "Dress-Up Day" on March 31 as part of its general program for property and service improvement.

Realizing that a neatly dressed trainman is one of the best advertisements, the management of the company submitted a proposition to its employees whereby it would furnish one complete new uniform if the individual also would buy a complete uniform at the same time. This proposition was readily accepted by the trainmen. The idea of two uniforms is to insure that the employees will have a neatly pressed uniform at all times.

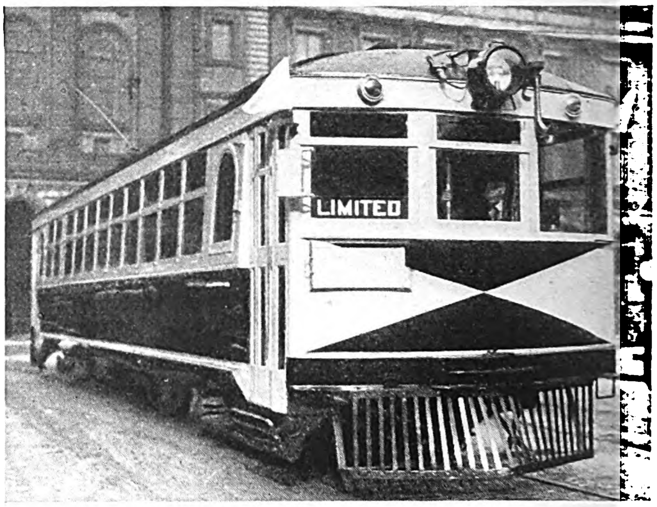
On "Dress-Up Day" many service stripes adorned the sleeves of trainmen on the line. Each stripe represented five years of service, and not a few trainmen proudly displayed as many as five gold service stripes.

In addition to this movement, headed by Frank H. Wilson, president of the company, the management has rightfully felt that the employees could not sell the service to the public unless they themselves were first sold. Thus by means of a series of meetings the problems and hopes of the management were laid before the men, who were quick to grasp the situation and organize as live salesmen for the Cleveland Southwestern company.

One of the many new moves to stimulate business is an arrangement whereby every ticket agent may earn a bonus each month. The business done at each station each month in 1926 is used as a quota basis for 1927, and the ticket agent and his force are paid a 5 per cent commission on all sales in excess of the quota.

Marked success has attended the putting into service of two rebuilt and redecorated light-weight interurban cars by the company. A color scheme of blue, ivory and yellow was worked out for their exteriors. The interior color scheme is in two restful shades of gray, with the floor covering of dark red linoleum. Bucket-type seats upholstered in taupe mohair and gray leather were installed. These seats were equipped with double cushions. Before placing the cars in service they were exhibited in numerous towns along the line and inspected by hundreds of people. In Cleveland, city and county officials and newspaper men were taken on a special trip, which was arranged so that the car would pass through downtown sections during the noon hour. Favorable comment was received from all sources upon the attractiveness of the cars.

This is not the first attempt of the Southwestern to improve the appearance of its cars. A de luxe parlor car service was inaugurated connecting Cleveland, Mansfield and Galion by the company about two years ago. The company's shops at that time rebuilt two cars for this special service, the cars being finished with the highest type of floor covering and seats, and the Pullman plan being followed in operating them, seats being sold from a diagram and passengers having the opportunity of making advance reservations. That this service was appreciated by the public is shown from the fact that during 1926 excess fare of $11,550 was paid by 32,000 passengers on these parlor cars.



One of the remodeled interurban cars of the Cleveland Southwestern Railway & Light Company which helped the company in its recent "Dress-Up Day"

During 1926 the company reballasted more than 60 miles of its tracks and overhauled 38 of its cars. A year prior to that the company purchased twelve new light-weight cars of the latest design to replace heavy and obsolete equipment. As a result there was a marked saving in every phase of operation. At the same time the company put its transmission lines into first-class condition, stringing more than 100 miles of new aluminum high-tension wire. In addition all bridges were rebuilt.

Owl Cars on "S" Line

The Los Angeles Railway, Los Angeles, Cal., has started operating owl cars on the "S" line on a 60-day trial basis. If the travel justifies, the service will be continued, according to R. B. Hill, superintendent of operation, and L. A. Racape, superintendent of schedules. Decision to give this service was reached after complaints from working men.

The Readers' Forum

Mr. Shoup Comments on Graham Articles and Bus Experience

PACIFIC ELECTRIC RAILWAY
SAN FRANCISCO, April 15, 1927.

To the Editor:

I have read with much interest articles in ELECTRIC RAILWAY JOURNAL of Feb. 26 and March 5 entitled "Fitting the Bus to Its Proper Place," by R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, and have noted your request for discussion thereof.

So far as the arguments and facts set forth by Mr. Graham with reference to his properties are concerned in the operations of urban transportation, and as they would apply to similar properties, there is little ground for discussion of the subject matter, as his exposition of facts and details relating thereto are very conclusive and convincing, and they have been beneficially applied to the Pennsylvania-Ohio Electric Company, but from experience of several years I am convinced that a large part of Mr. Graham's plan, as well as his deductions, would not apply to the urban transportation of the Pacific Electric Railway for the following principal reasons:

First—The transportation units of the Pennsylvania-Ohio Electric Company are of similar type, namely, Birney cars and single-deck buses, whereas urban service upon the properties of this company is performed by a variety of equipment, ranging from cars of the Birney type to that of steel interurban type, and for the further fact that in a number of instances both local and interurban service are operated over the same tracks.

Second—Mr. Graham is an exponent of the flat fare per ride, regardless of the distance to carry, which would probably be a satisfactory fare within the 3-mile single zone encompassed in his Youngstown situation, but we are convinced that price should be predicated upon distance traveled, and our operation in Los Angeles under that basis is satisfactory both to ourselves and to the public served, thereby overcoming (through the zones) to some extent, the lack of seat resale such as would be obtained by local lines operated through a metropolitan area where change of load and resale of seats was of more frequent occurrence.

PASADENA GIVES SOME COMPARISON

The only service we have comparable with that of the Pennsylvania-Ohio Electric Company in Youngstown is in the city of Pasadena, where we are operating a unified rail and motor coach service, Birney cars and 25-passenger White coaches. The same fare is charged on both carriers, with a general interchange of free transfers. Pasadena has a population of approximately 75,000. Every line, whether bus or rail, commences in the center of the city, and in some cases, particularly on East Colorado Street, the coaches parallel the rail service for a considerable distance. Both the buses and cars, as well as the tracks on which the cars operate, are in first-class shape. Our experience in Pasadena is much the same as found by Mr. Graham, in that the choice between the rail and the bus is mostly a matter of convenience to the passenger. Elderly people prefer the buses due to the fact that they pull up to the curb. Among the middle-aged and younger folks there is probably a slight preference for the street cars.

We are operating about 39 Birney cars and about 50 coaches in the Pasadena service. The primary motive for the establishment of bus lines was that a number of rail lines in that city had reached the point where they had to be rebuilt and large expenditure in that connection was not justified from the revenue received. In other cases additional service was necessary owing to the development and extension of the city. The rail lines which were worn out and for which bus service was substituted were not making net earnings and are not at this time, under bus operation, showing net revenue. Service upon such routes, however, is a necessary part of the local transportation plan in Pasadena.

OPERATING COST OF BUSES AND CARS IDENTICAL

Our experience in Pasadena is that we are operating 32-passenger Birney-type cars in rail service with practically the same cost as the 25-passenger White buses, and this comparison includes every item of expense—operating expenses, taxes, depreciation and interest on investment. The traffic, however, on the rail service routes is much heavier than on the motor coach routes; in other words, the motor coaches cover the lighter traffic lines. At the present rate of fare, namely, 7 cents, with eight tickets for 50 cents, the rail service is operated profitably, about or perhaps a little more than offset by the losses in the motor coach operation.

The Pacific Electric operates no special service on bus lines such as is contemplated by Mr. Graham, and which would be "de luxe service" as compared to the regular service, and for which a much higher fare would be charged than that imposed by regular buses and rail service.

From time to time during the past several years our views have been made known at conventions of the A.E.R.A. and through articles in electric railway publications, and these views have not been materially changed through experience; and these include the view that the place of the bus on the electric railway properties is of the auxiliary or supplementary nature. It has been, and is, the practice of the Pacific Electric to establish and maintain bus lines simply as feeders to the main rail traffic arteries for the bringing of these people to the "metropolitan area," or in urban territory where traffic is light, in contrast to the plan submitted by Mr. Graham which indicates bus lines also entering the metropolitan area direct.

Bringing these buses into the metropolitan district would add very materially to the already highly congested street traffic and further impede traffic movement of the rail lines. The traffic congestion at this time is one of the most serious problems faced by this railway, both in local and interurban operations.

In several instances this company has acquired from other owners by purchase competing bus routes, but the service, with the approval of the public, has been made feeder to that of the electric cars. Feeder lines to our main rail lines are established in Pacific Electric territory when the need for such service is made manifest by surveys and where there is the probability that the line will pay its way; if not immediately, then within a reasonable time. It is our policy to abandon such service if, after reasonable trial, it does not develop sufficient revenue, either directly or as a feeder, to justify it.

It is agreed that the bus is a factor in transportation and as such must be viewed with an open mind, but its adaptation to territory either alone or in conjunction with rail lines is a matter for each individual property to judge for itself, because on no two properties will identical conditions be found and in no two sections will the same travel habit be found.

An important factor is the franchised auto carrier, which in some instances has acquired paralleling operative rights prior to commission control in semi-urban and interurban territory, operating at a lower fare than the rail lines, makes no commutation fares for workers, not attempting to carry peak loads—merely content to skim off the cream. This may or may not apply in communities elsewhere as it does in Pacific Electric territory.

It is evident, also, that a comparison of Pacific Electric urban conditions with that of Pennsylvania-Ohio properties could not be reasonably made because of the largely varying units of service operated in Pacific Electric territory, particularly in Los Angeles and its suburbs, where it varies from one to five car units, thereby taking it out of the single bus and single car comparative field. This diversity of units is necessary because of high morning and evening peaks of travel and variation of travel throughout the day.

So far as it relates to the Pacific Electric Railway, and we believe also to other properties of comparable size and traffic, with urban and interurban operations, mass transportation by buses is beyond possibility.

For our own purposes, the co-ordination of buses with rail lines as supplementary thereto and as feeders is the proper policy, with every effort bent toward expediting service over rail lines by the elimination of sources of delay, such as grade crossings, traffic congestion and unnecessary speed restrictions.

PAUL SHOUP.
President.

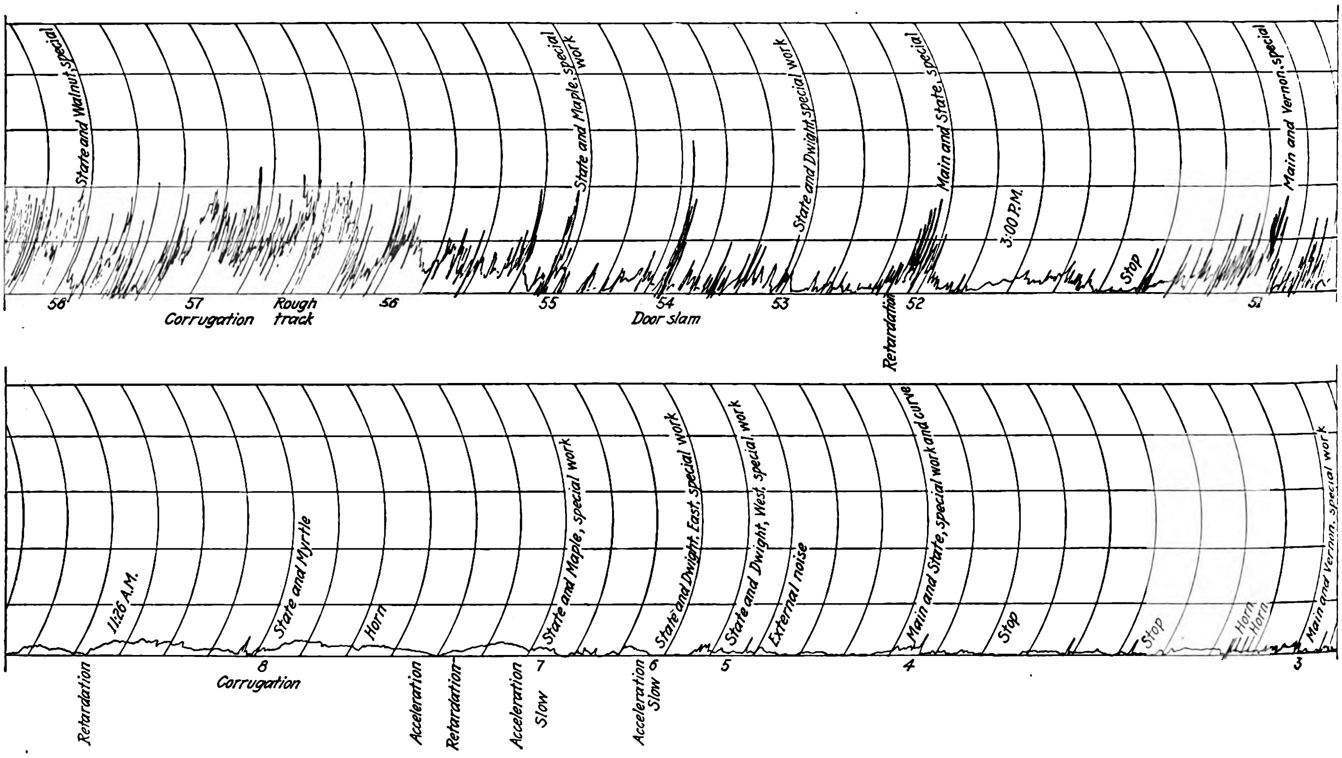
Test Shows Springfield Car to Be Quiet in Operation

SPRINGFIELD STREET RAILWAY
SPRINGFIELD, MASS., April 26, 1927.

To the Editor:

I have read with no little satisfaction your editorial of April 23 having to do with the noiseless street car. One part, however, I think is rather misleading. You say that "From the standpoint of noise reduction the car did not seem to live up entirely to what had been anticipated for this design. This was particularly true on the interior of the car." In this connection it should be understood that we did not expect to eliminate all noise, but were endeavoring merely to effect a reduction. That this has been accomplished in large measure is shown by the results of noise measurement tests made by Mr. Williams and his committee of the American Electric Railway Engineering Association. From the accompanying charts showing measurements made during a trip of one of our older cars and during a trip of the new car it will be seen that a substantial reduction has been made in the noise of operation.

C. V. WOOD,
President.



Noise measurements made on one of the older cars of the Springfield Street Railway, above, and on the new experimental car, below, show clearly that the latter is much more quiet in operation

Pacific Coast Company Leases Boats to Be Tied in with Railway

THE Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission to lease to the Golden Gate Ferry Company, and the latter company has been authorized to hire and operate, the ferryboats *Fernwood* and *San Francisco* on the San Francisco-Sausalito line of the latter company, for a period of three years. The total rental will be $24,500 for each boat, to be paid at the rate of $700 a month per boat.

Maintenance Men

May 14

is the DEAD LINE for First Monthly Prize Material

Three Capital Prizes

First - - $200
Second - - $100
Third - - - $50

Twelve Monthly Prizes

$25 Each

Don't Miss This Opportunity to Win

ITEMS published in the maintenance data sheet section of ELECTRIC RAILWAY JOURNAL dated May 21, 1927, will have the first chance to win one of the $25 monthly prizes. It takes some time to prepare material after it is received at the New York office. In order to prepare proper illustrations and set the type for the first items to be used it is necessary that material be in New York not later than Saturday, May 14. Contestants will still have time to get their material in after reading this, if they act promptly. Some items have already been received. This material has been edited and is ready for publication.

ELECTRIC RAILWAY JOURNAL is offering the prizes in this Maintenance Data Contest to help maintenance men win recognition which they deserve in the industry. Enter the contest at once. Send in as many of your maintenance practices as you like. The JOURNAL will pay $5 for each item published whether or not it wins a prize. The more items you send in the more chances you have of winning a capital or monthly prize. Get started at once. Maintenance men, here is your opportunity!

FOR the benefit of new readers and those who may have missed the announcements in previous issues of ELECTRIC RAILWAY JOURNAL, the conditions for competing for the various prizes offered in the Maintenance Competition are restated in condensed form. Full information will be found in the April 16, 1927, issue, pages 700-701.

Three capital prizes will be awarded for the three best maintenance ideas submitted before Aug. 1, 1927. These are: First prize, $200; second, $100, and third, $50. In addition twelve monthly prizes of $25 each will be awarded, one each month beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Sheet Section of ELECTRIC RAILWAY JOURNAL, and a minimum of $5 will be paid for each article published.

Any employee or official of an operating electric railway or electric railway bus subsidiary may compete for the prizes.

Each contestant may submit any number of items he desires. Each will be judged separately.

The prizes will be awarded primarily on the value of the idea presented and its adaptability to maintenance work on electric railways. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may describe any maintenance practice or device used by any department of an electric railway, such as the maintenance of rolling stock, buses, shop equipment, or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc.

Articles should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words, with not more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue and 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated before Aug. 1, 1927. Photographs or sketches that accompany the manuscript may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made. Photographs, sketches and manuscripts should be marked so that should they become separated they can be identified readily.

Monthly prizes will be judged by the committee, to be announced later, after the articles are published in the Maintenance Data Sheet Section, the best item being selected each month from those appearing in the issue in the month devoted to Maintenance and Construction.

The announcement of the winner each month will be made in the issue devoted to Maintenance and Construction, the third issue each month, following the one containing the items.

The winners of the capital prizes will be announced in the Annual Convention Number of the ELECTRIC RAILWAY JOURNAL to be published in September, 1927.

Maintenance Notes

High-Powered Snow Plow Mounting

EARLY this year the mechanical department of the Kansas City Public Service Company completed two high-powered snow plow attachments designed to fight the heaviest snow storms and clear the tracks of drifts.

The attachments were applied to cars of the Differential dump type equipped with four 90-hp. motors with HLF control. The plow is constructed of a special reinforced steel, 16 ft. long and 3 ft. high, hinged to the main steel underframing of the car and set at an angle of 45 deg. with the track. A smaller wing plow is hinged to the left end of the main shear and is used for cleaning up the devil strip between the tracks. The wing can be raised to clear obstructions, such as poles and standards, where the overhead is carried on poles between tracks.

The plow is raised and lowered from the cab by compressed air, controlled by a standard type of brake valve. It can be raised to a height of 10 in. above the rail by a movement of the air valve, thus quickly clearing any unforeseen obstacles on the track, and it can be adjusted to any desired height for plowing snow.

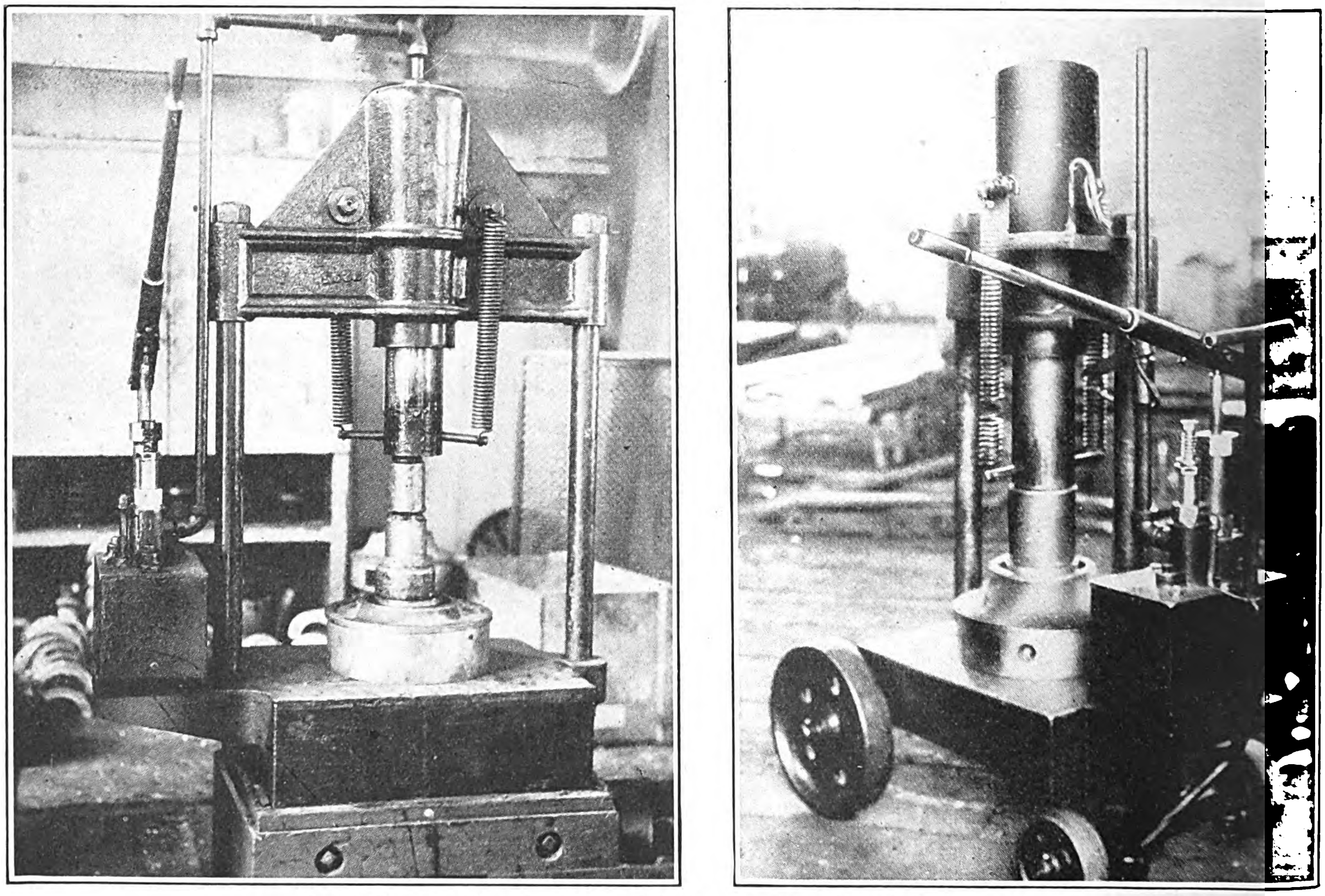
Provision is made so that the plow can be attached or removed on short notice so that cars can be used for regular construction work when not combating a heavy snowfall.

Hydraulic Presses Serve Many Purposes

HYDRAULIC presses are used for all fitting work around the shops of the Los Angeles Railway which does not require a pressure in excess of 15 tons. Seven of these presses are used on the property, five at the division inspection shops and two at the main overhaul shop. One of these latter is portable. All were made in the shops.

Construction of the press is relatively simple. The base is of cast iron, about 24 in. square and 6 in. deep, with tension rods and head support securely fastened in bosses on each side of the base plate. The head is carried approximately 20 in. above the base. The iron head casting contains the cylinder, which is lined with bronze. The ram, whose diameter is 4¼ in., has a stroke of 12 in. Return springs connected with cross arms near the end of the ram are secured to the head casting by drilled bolts.

The press is operated by a hand



Type of hydraulic presses used in the Los Angeles Railway shops

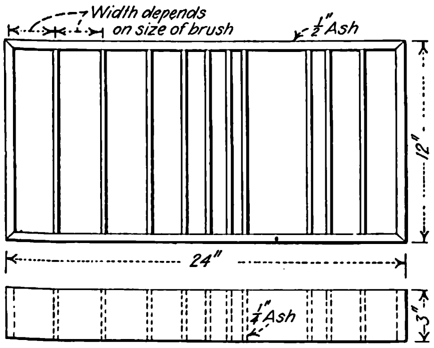
One of the stationary types is located at each division inspection shop. The view at the right shows one of the portable types which are in service at the main repair shop pump on top of an oil reservoir mounted on an extension of the base. The pump is of the single action type, the 24-in. handle having a leverage of approximately 6 to 1. Release of pressure is possible by depressing the handle to a point where it engages an extension of the relief valve. In the illustration the relief valve is shown directly in front of the pump cylinder.

Both the presses illustrated are being used to insert an armature bearing into its housing. On this particular work the pressing fit is between 0.004 and 0.006 in. A pressure of 3½ tons is required. A gage mounted on the top of the tee connection between the pump and the ram cylinder indicates this pressure. The illustrations do not show this gage.

Clean and fumigate your cars thoroughly on the inside so your patrons can't say "thanks for the buggy ride."

Receptacle for Storing Compressor Brushes

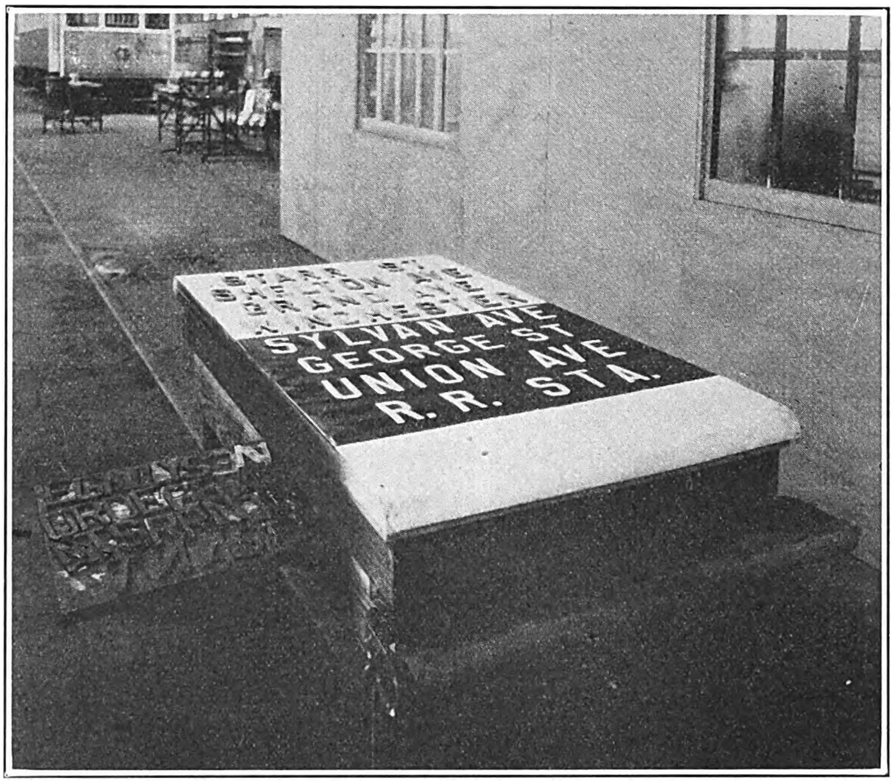
CHEAP but effective is a receptacle for the storing of air compressor carbon brushes designed and adopted by C. W. Wood, master mechanic of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va. It consists of a box made from ½-in. ash, 24 in. long, 12 in. wide and 3 in. deep. This box is divided into sections of such a size as will accommodate a certain size of brush and each section is stenciled for the type and style of brushes it can hold. A special section is included in the receptacle for the storage of worn-out or defective brushes.



Wooden box used by the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., for storing air compressor brushes

Prior to the adoption of this box brushes were strewn about the shop floor and the cost of brush replacement was exorbitant. This practice has now ceased, resulting in lower brush replacement cost.

Roll Signs Painted by Spray Method



Painting roll signs by the spray method in the Grand Avenue shops of the Connecticut Company

In this view the lower half of the sign has been painted and the metal letters have been removed to the near-by tray. On the upper half, which has not been sprayed, the letters remain in place.

MUCH time has been saved in the preparation of curtain destination signs by the use of spray painting at the Grand Avenue shops of the Connecticut Company, New Haven. Formerly new signs or sections of signs were made by outlining the letters and filling in the background by hand. A little more than a year ago J. E. Dooley, master mechanic, conceived the idea of painting metal dash signs by the spray method. Details of this process were given in the ELECTRIC RAILWAY JOURNAL for Aug. 8, 1925, page 211. It proved so satisfactory that recently it was adopted for roll signs.

A piece of sign cloth of the desired width and necessary length is laid on the top of a low table and secured by thumb tacks. One edge is then marked off in 6-in. lengths. A T-square is next lined up with the second mark from the top end of the cloth. Against the upper edge of the T-square are placed metallic letters 4 in. high. These are made of old babbitt metal by casting in forms made in the shop. The thickness of the letters is ⅜ in.

Watch your "P's" and "Q's"—pints and quarts of oil. And don't let your oiler be a lubricating bootlegger.

Spacing is done by eye. As soon as one line has been completed the T-square is moved down to the next 6-in. mark. After all letters have been placed, heavy pieces of paper are laid across the ends of the cloth to protect it from the paint. Black paint is then sprayed over the entire surface. The weight of the metal letters is great enough to prevent their accidental displacement during the spraying. After the painting has been completed the letters are lifted by means of wire handles and laid on a tray alongside the table.

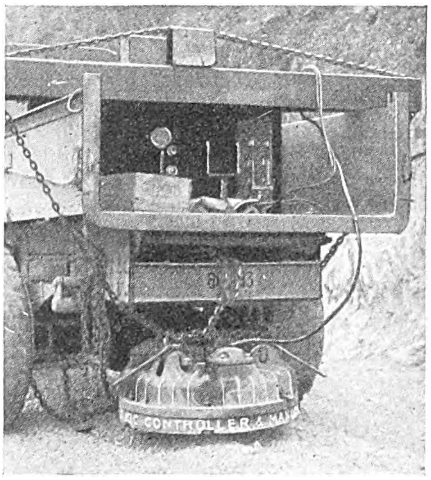
This method produces neat, clearly legible signs, quickly and at moderate cost. Since its adoption the company has been able to re-equip all cars when they are overhauled.

New Equipment Available

Magnets Clear Roads of Nails

OPERATORS of buses can profit by the experience gained from clearing roads of nails, tacks and other metal pieces to reduce tire troubles and damage. Lifting magnets of types manufactured by the Electric Controller & Manufacturing Company, Cleveland, Ohio, are used to accumulate the various metal pieces. This equipment can be attached to a truck or bus and should prove a valuable maintenance unit.

The accompanying illustration shows the equipment as used in Kellogg, Idaho. A No. 3 type SA lifting magnet was suspended from the rear of a 5-ton truck so that its lower face was about 4 in. above the road surface. Electric current was furnished to this magnet by 72 cells of regular locomotive type Edison storage battery. This outfit was operated back and forth along the road until it had covered the entire surface. Operating over 5 miles of roadway, this magnet picked up 150 lb. of nails, bolts, wire and scrap iron, all of which constituted a severe menace to tires.

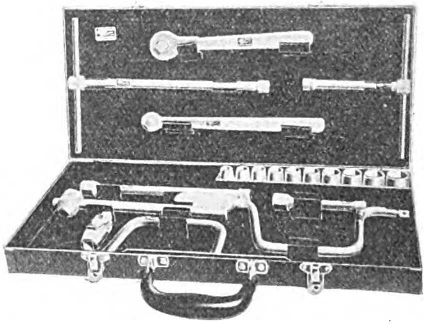


Lifting magnet applied to the rear of a 5-ton truck for picking up iron material from the roadway

At other places a different arrangement of magnets was tried. In Carson City, Nev., two lifting magnets, each of 22 in. diameter, were suspended between the front and rear wheels of a 5-ton truck with their faces raised 5 in. above the surface of the roadway. Magnetizing current was supplied to the magnets by a 5-kw. d.c. generator driven by a gasoline engine, mounted as a unit on the truck. In one round trip on a 100-mile section 1,370 lb. of nails, spikes and scrap iron were picked up. This equipment was also used to clean the streets in Carson City, where 4,850 lb. of iron material was picked up in two days.

Socket Wrenches in a Case

CHROME vanadium socket wrenches and handles packed in sets in an enameled metal carrying case with leather handle are being placed on the market by the Bonney Forge & Tool Works, Allentown, Pa. The set consists of ten chrome vanadium hexagon sockets from $\frac{7}{16}$ in. to $\frac{7}{8}$ in. inclusive and chrome vanadium handles. The handles included are solid offset, offset ratchet, sliding tee, solid tee 6 in. long, solid tee 12 in. long, two brace or speeder types 5 in. extension, 10 in. extension and universal joint.

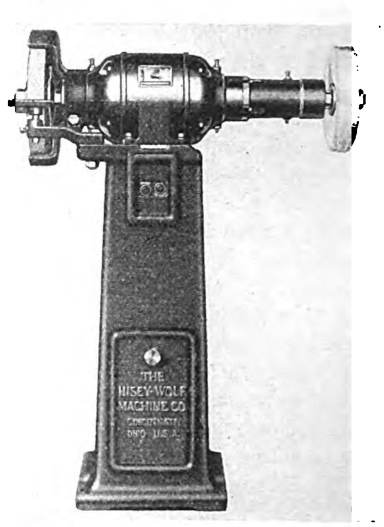


One of the sets of ten chrome vanadium socket wrenches and handles

Combination Grinding and Buffing Machines

EIGHT new models of combination grinding and buffing machines made in 1 hp. and 2 hp. sizes are being marketed by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The accompanying illustration shows one of the machines which is equipped with incased type spindle extension and which because of its rigid double ball bearing construction is recommended for heavy-duty buffing, polishing and scratch brush work.

Some of the important details incorporated in the new line of machines include high grade over-sized ball bearings mounted in the heads in close proximity to the wheels. All bearings are inclosed completely and are protected from dust and grit. The oil chambers, with a capacity to last two or three months, have suitable flush or drain pot plugs to permit occasional cleaning. Grinding wheels have a diameter in proportion to the motor speed. This gives safe and efficient travel.

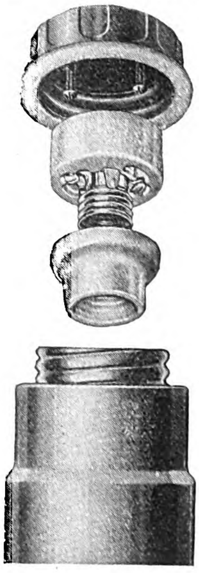


Pedestal type of combination grinding and buffing machine

Socket Installation Simplified

SOCKET bases fastened to the canopy by screws fitting into bayonet holes form a development in Durex sockets announced by the Wheeler Reflector Company, Boston, Mass.

This new principle in socket construction enables a twist of the wrist to remove or replace the socket in a moment. The porcelain socket shell screws on and off easily, exposing the contact screws for wiring.



New type socket

Association News & Discussions

Railway Section Shows Enthusiasm at New Orleans

ENTHUSIASTIC, active discussion of outstanding topics of the moment crowded the meetings of the railway section, Southwestern Public Service Association, at New Orleans on April 26-29. A preliminary telegraphic report of the convention was published in last week's issue of this paper.

The general subjects taken up by the railway men ranged from "Telling the Transportation Story" to "Modernization of Equipment." Traffic control occupied a large part of a full afternoon session. Discussion from the floor was active on each topic and Past-Chairman W. W. Holden, who presided in the absence of Chairman W. H. Burke, Southwestern district manager Stone & Webster, was several times forced to limit the discussion to keep within the allotted time.

Those who spoke or prepared papers for the meeting included President W. H. Sawyer and Managing Director Lucius S. Storrs of the American Electric Railway Association. A. J. Sarre, R. M. O'Brien, A. J. Naquin, Ben Commons, and Captain Casey of the Police Department, New Orleans; G. I. Plummer, B. R. Brown, C. J. Crampton, Dallas; R. C. Foreman, P. S. Duenweg, Carl Frazer and Public Service Commissioner C. J. Kirk, Houston; W. W. Holden, L. McInery, San Antonio; J. G. Holtzclaw, C. A. Brann, Beaumont; F. B. Scurlock, El Paso; C. L. Van Auken, Chicago; Charles Gordon, New York.

As reported last week, both President Sawyer and Mr. Storrs pointed to the changed conditions which face electric railway men to day. Their addresses before the general sessions of the association are abstracted elsewhere in this issue. Mr. Storrs commented on the active discussions which took place throughout the meeting and characterized it as an inspiration to railway men not only in the Southwest but in the entire industry as well.

Making Salesmen of Car Operators

Taking the topic of telling the railway story to the employee, Mr. Foreman outlined the work of coaching car operators to be salesmen. He held that the chief aim in coaching a group of employees is to train them so they will be responsible representatives of the company with initiative and judgment of their own. For this purpose he considered the academic and lecture method of instruction and training to be very weak. To win the active interest and co-operation of a group of employees, some point of common interest and ambition must be the foundation on which to build. Working on this idea in Houston, he found that the underlying ambition in every man's mind, to become able to speak on his feet and express his ideas, furnishes a basis by which employees are naturally attracted and by means of which their interest can be enlisted in self-improvement and in loyalty to the company's objectives in serving the public. A course of self-education has been successfully developed by the Houston Electric Company through the means of a class in public speaking. This class is composed of heads of departments and goes through the entire organization, taking the men in groups of fifteen to twenty. Through this course information is transmitted to each employee from the department heads and from the more articulate and intelligent of the employee group. More important than the information transmitted, Mr. Foreman pointed out, is the self-confidence which is built up and the interest in the work and in the company's problems that is enlisted. The ultimate objective is the development of each man as a salesman in the true sense of the term.

Practices of the New Orleans property in the training of employees were outlined in a paper by A. J. Sarre, which is abstracted elsewhere in this issue.

"Management is reflected as by a mirror in the action of the men on the cars," said acting Chairman Holden, speaking on this subject. He maintained that the management must be sincere in its thinking and actions and that unless that condition exists on a given property, the weakness will be reflected in the employees clear down the line. Even in the brief contacts which the railway manager has with his men, he explained, permanent impressions are made which affect the attitude toward the company and the public of every subordinate. "Men learn new things best by doing them." said Mr. Holden. In preparing a course of training, therefore, it was his opinion that this should be the guiding principle to be followed. He held that a proper training course should also give the man a real opportunity for doing his own thinking under proper direction. "If a man's heart is right and he is thinking. he may be expected to perform satisfactorily."

Practice in Advertising

Advertising as a means of telling the railway story to the public was the subject of a paper prepared by C. J. Crampton, and read in his absence by Mrs. C. C. Owen. Mr. Crampton found that railway practice favored daily newspapers as the best medium for addressing the public through advertising. Next to this he classed car cards and after that, billboards and moving picture films. He advised avoidance of specialized advertising such as one-time publications and programs. Money spent in these latter mediums should be classed as good-will contributions rather than as advertising.

Railway advertising in general he grouped in three classes as to the purpose: good will, merchandising the service and selling securities. The copy used for the first class is usually conceived from the viewpoint of keeping the public informed regarding the company and its activities. Sometimes copy in this class is devoted to talking about the employees of the company. This practice, according to Mr. Crampton, helps to inspire a desire on the part of the employees to live up to the standards set by the advertising.

In selling the service of a railway property through advertising, a number of copy appeals in use were listed. These include appeals built on the economy of electric railway transportation, dependability, safety, comfort, freedom from the petty annoyances of the automobile and opportunity for relaxation, reading, etc. The sale of service through advertising is only in its initial stages, is Mr. Crampton's opinion. He questioned the value of the "economy" appeal in copy, and felt that the public is more interested in "keeping up with the Jones's" than in "saving the difference." He expressed the opinion that comfort, dependability and freedom from traffic worries are more valuable selling appeals than that of economy.

Performance Must Live Up to Promise

The speaker cautioned against any attempt to exaggerate in advertising or to use advertising when the service does not measure up to the promise. Such a situation, he held, produces a reaction that is considerably worse than if no advertising at all were used. Mr. Crampton called attention to the increasing tendency to spend more money for art work and expert composition in the preparation of railway advertising. "Persistence," he said, "is the secret of advertising results with any particular kind of copy." Success in winning public approval, however, is dependent on providing a service which measures up to modern requirements.

The outline of a talk that is given to each new employee hired by his company was given by Mr. Brann. An abstract of his remarks is printed elsewhere in this issue. Mr. Duenweg testified to the value of the public speaking work in Houston as a means of interesting the men in their work and in improving their contact with the public. He held that when the men are really interested in their work and in pleasing the public, the company does not have to give much attention to telling its story to the public; that the men will do that most effectively. Commenting on this Mr. Holden said that not enough railway managers have sufficient faith themselves in the future of the electric railway business.

ENLISTING MECHANICAL MEN IN PUBLICITY WORK

Mr. Brown felt that not enough attention is given to the men in the various mechanical and maintenance departments. These men, he held, have frequent contacts with the public and become a powerful force for good or bad impressions. Mr. O'Brien called attention to the work done by the Association of Equipment Men, Southern Properties, and urged railway managers throughout the Southern territory to encourage their master mechanics to take part in the work of the mechanical men's organization. Mr. McInery felt that instruction in public speaking should be carried to the men in mechanical departments as well as to those in transportation work.

Speaking on the problems of improving traffic conditions, C. J. Kirk, Public Service Commissioner of Houston, criticised street railways for lack of frankness with the public on the matter of traffic control. This situation, he held, has developed beyond the crossing policeman and requires more scientific methods and study by experts. Street railway companies should take the initiative in bringing all the elements in a community into a united organization for the solution of an important and baffling community problem, as the representative of a large part of the people who make daily use of the streets. He felt that the average company is entirely too timid in demanding that consideration to which it is entitled in connection with this vital subject. American communities, he said, need help from the utilities in working out relief measures.

An interesting view of the traffic situation as seen by the man on the platform of a street car was given by Ben Cummings, a motorman of New Orleans Public Service, Inc. The first step in the relief of congestion, he held, is prohibition of obstacles to the free flow of traffic. Success of any ordinance or regulation which is put into effect for the relief of congestion is impossible, however, without co-operation of police, public officials and the railway.

A paper prepared by J. G. Holtzclaw on the subject of modernizing electric railway cars created considerable and lively discussion. An abstract of the paper is printed on another page. Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, discussed the significance of the developments in cars that are being made in various cities and showed a number of photographs of the new worm-drive car which was recently completed in Springfield, Mass.

In acknowledging his election as chairman of the railway section for the ensuing year, Mr. Paterson pledged himself to continue the good work which has been done by his predecessors, and among other things pointed to the importance for electric railway success of obtaining an adequate rate of fare which will permit a program of improvement to be carried out.

Public Is Getting Better Understanding of Local Transportation*

BY LUCIUS S. STORRS
Managing Director American Electric Railway Association

IT HAS taken years for the urban transportation industry to obtain a general recognition by the public of the basis upon which operations can be successfully developed and maintained. Then, too, there are yet all too many places where these fundamental facts are still beclouded, either by a lack of full information or prejudices which frequently are the inheritances of old conditions that the public holds against the present operators, despite the injustice of it.

Briefly these fundamentals are: (1) The dependence of any community upon public transportation for its growth and the personal prosperity of its people. (2) An appreciation on the part of transportation executives that while an irreducible minimum of passengers will use the services because they must; to become entirely solvent the company must offer such service as will invite a vastly greater use of the cars or buses. (3) A complete willingness on the part of the people to make their transportation corporation a profitable business enterprise either through a large use of the cars or a somewhat lesser use at higher rates. There is nothing mysterious in our business and through no legerdemain can profits be established; it is just a plain business proposition. The public needs efficient service, nor does it care one iota who provides it.

REMARKABLE RECORD LAST YEAR

Local transportation service, with street cars as the backbone and buses being used supplementally, is making rapid strides in most parts of the United States. During the last year electric railway managements furnishing this joint service and embracing 78 per cent of the total carried some 14,600,000,000 passengers. Doubtless the entire industry carried many more than the previous high record of 16,000,000,000. Even this old record is about seventeen times as many riders as were carried by the steam railroads and many times the number carried by independent bus lines not run by street railway companies. It is three out of every four persons who ride in the streets in any kind of a vehicle. In other words, for every person who rides in a taxicab or an automobile or an independent bus in American cities three persons ride rail lines and buses run by electric railway companies.

This is a remarkable record, particuuarly when we recall that less than ten years ago, due to increased costs caused by the war, one-sixth of all the electric railway mileage in the United States was in bankruptcy or receivership. It was then generally predicted that electric railways were dead. Now they are growing stronger daily, primarily in metropolitan centers.

Improvement of local transportation in any given city invariably follows these steps: (1) The adoption of an operating agreement, contemplating high-class service, with modern equipment for the riding public and a fair return on the value of the property to the investor. (2) Elimination of competition by the placing of all local transportation, including rail and bus service, into the hands of single managements under the direct supervision of public authorities. (3) Elimination of downtown parking of automobiles. The fare issue, which once was the chief cause of controversy in almost every city, no longer is the dominating one in most communities. Public officials who put good service first generally have long since recognized the need for higher fares to meet increased costs and willingly grant them. As a result, the average fare for the United States today is 7¾ cents, and 10 cents in most large cities. Fares which permit just returns for owners of the properties are quickly reflected in improved service.

Service also is being improved in many communities through readjusting electric railway taxes, thus giving the companies more money to spend on general betterments. The most general tax adjustment being made at present concerns paving. In five states and some 50 communities companies have been relieved of paving costs in whole or in part. This is only simple justice. During this legislative session New Jersey has fallen into the line of progress, a bill for the relief from this tax having been enacted.

That competition destroys service and that the best results are obtained from permitting single companies to operate both street cars and buses in their respective communities is being proved repeatedly. The thought of a few years ago that the competing buses would drive street cars off the streets, or at least compel them to reduce fares, has been clearly shown to be unsound. Competition has damaged service and increased fares. Throughout the country there is a general movement toward the consolidation of street railway and bus lines under single managements. Three hundred and thirty-two electric railway lines now are operating nearly 8,000 buses and good results are being obtained from this co-ordinated program.

RAILWAY EXTENSIONS CONTINUE

Instead of replacing the electric car, the bus has added greatly to unified public transportation service. During the last ten years more electric railway track has been built than has been abandoned and the bus has driven very few lines out of business. They have added some 15,000 miles of extensions to electric railway properties, tapping new territory where the traffic was not dense enough to warrant the laying of rail lines.

The bus is finding its place in serving as a supplemental carrier to the electric and steam car. It has not replaced the street car widely because it cannot carry large numbers of persons as cheaply or quickly in congested centers. Where passengers are few and scattered the bus can give a service, even though unprofitable, that otherwise would not be possible. It is finding a much wider use in providing an auxiliary type of service to the rail lines which can only be given by a different kind of vehicle—one that more nearly approximates the private auto.

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*Abstract of an address before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

There are almost 3,000 more electric cars in regular daily use today than there were in 1919. For instance, Los Angeles alone has 671 more cars in regular service than it had in 1919, Detroit 446, Chicago 425, Pittsburgh 175, St. Louis 155 and Milwaukee 114. The discontinuances of rail lines have been scattered through about 60 small towns. They occurred in such places as Albany, Ga.; Streator, Ill.; Iola, Kan.; Hattiesburg, Miss.; Nelsonville, Ohio; Lykens, Pa., and Waupaca, Wis. The average operation was seven street cars to a town. Generally speaking, street car service never should have been started in these small cities and would not have been if buses were available when the rails were originally laid. Many towns too small to support an electric rail line find the bus useful.

There is no indication that electric lines in urban centers are going to be seriously affected by the bus. There is every indication that the electric railways will continue to use the bus as a very helpful supplemental agency and through its use will find entirely new types of service that will attract the public. This growth is evident wherever local transportation company managements and the public, represented by city and state officials, have ceased bickering, quarreling and mud-slinging and sat down at round-table conferences to iron out their problems. The need for good transportation is mutual. Companies must give it or they cannot make fair earnings. Cities must have it or they cannot prosper. Recognition of this fact and an honest desire on the part of both public and management to play fair inevitably results in progress and profit for all.

PUBLIC OWNERSHIP UNDESIRABLE

There is more or less talk at present regarding the advantages of public ownership of public utilities. Sometimes there is talk of cities taking over electric railway properties, though not as often as of other utilities, it is conceded. A few cities have taken over the street railways and the results have not been particularly gratifying, to the public who furnished the money with which to purchase them, the riders who paid higher fares or the unfortunate managements who tried their best to render good service and carry out the orders of politicians at the same time.

A brief summary of the results of public ownership of electric railways gives such a convincing picture of inability to produce any remarkable achievement and the entire lack of claimed public betterment as a result from lower charges that the local transportation branch of the public utility business should be in little danger of having to undertake an active campaign against such attack. In fact, these spasmodic efforts of the public to provide service of this kind in a manner or at a cost that would receive public acclaim should be useful to the utilities as a whole in any discussion of the subject.

EXPERIENCE CITED

Detroit is a good example. Fares there have been raised under public ownership, but that is not the worst thing that has happened. Just as predicted, just as invariably happens in a case of public ownership of a public utility, local politicians soon got into the saddle. Detroit already has had three general managers of its municipal railways, and they alone know what a difficult job it has been for them to try to run the railway lines to suit the politicians. The fact is that the property is shot through with politics, that because of this the morale of the men on the lines is low, and that this condition is likely to continue just so long as the city, which means the politicians, operate the cars.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 11-12—**Central Electric Railway Master Mechanics' Association, meeting, Webster Hall Hotel, Pittsburgh, Pa., 9 a.m.**

May 12—**New England Street Railway Club, meeting, Copley Plaza Hotel, Boston, Mass., 3.30 p.m.**

May 18-19—**Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.**

May 31-June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, St. Louis, Mo.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24 — **American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1 — **Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1 — **Tramways and Light Railways Association, annual meeting, Bath, England.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Oct. 3-7—**American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open Oct. 1 at noon.**

San Francisco is having its troubles with a municipal line. Only part of San Francisco is served by the municipal property. It has been able to get along on a 5-cent fare by virtue of serving chiefly the territory of dense traffic and by a clever system of municipal bookkeeping which relieved the property of tax charges, depreciation costs, etc. Now extensions are needed, and within a month Adolph Uhl, manager of the San Francisco City Efficiency League, a prominent local body, has declared that proposed extensions and other costs would compel an 8-cent fare.

Seattle's experience is well known. The city took over the street car line because the politicians objected to an increase from a 5-cent fare. Under municipal operation a 10-cent fare soon was reached. Then, to prove that the way to make money was to have a 5-cent fare, it was restored. After the city had lost $750,000 experimenting with the nickel fare, the 10-cent cash or three tickets for a quarter fare was returned. Now the property is having trouble meeting its interest charges and the rolling stock is deteriorating.

These three outstanding examples of what municipal ownership of traction properties mean in the United States should be enough to warn any municipality against it.

Traffic congestion due to parked automobiles is one of the most serious problems of local transportation in every city. The 75 per cent of the people who use electric cars and buses as a means of transportation are being viciously delayed by the small minority who are permitted to park their automobiles in downtown streets. The common-carrier riders are the chief sufferers, but the majority of motor car owners, who cannot find places to park, also are being delayed by the select few who use the streets for garages.

DOWNTOWN PARKING MUST GO

A widespread protest against downtown parking is under way in this country and its result is as certain as tomorrow's sunrise. Downtown parking of automobiles must go. Nothing so unfair to a majority of the people can remain. The streets were built by all the people to be used as highways, and not as storehouses. Therefore, every vehicle which uses them, whether it be a street car, a bus or a private automobile, is entitled to reasonably free movement.

This fact has been recognized in Chicago, Los Angeles, Pittsburgh, Philadelphia, Cleveland and some parts of New York. Wherever parking has been wholly abolished, or restricted, street car and bus service carrying a vast majority of the people has been greatly improved.

Parking should be abolished particularly during the morning and evening rush hours. Generally, these hours are from 7 to 9 and 5 to 7. Most electric railways carry half of their total day's load during these four hours. Of the 43,000,000 daily passengers in the United States more than 20,000,000 are handled during these four hours. These 20,000,000 especially, most of whom are workers anxious to get to their places of employment or home to their evening meal after a hard day's work, are entitled to a clear path. There is no excuse for empty cars being parked along curbs so that moving traffic has to get over on the car tracks and obstruct workers. Think of the injustice of a parking regulation which permits one man to park his car at a curb and throw moving traffic over in front of a street car and thus delay 75 or 100 workers.

Good local transportation service makes prosperous cities and adds to the comfort of the people. It can be obtained by passengers insisting that they and the operating companies get a square deal. The people of this country want honest business to have a fair chance, and when shown that the utilities are being honestly conducted, the vaporings of the proponents of public ownership will fade rapidly.

However, it is important to bear in mind that the public must have the whole truth and nothing but the truth. It must be told to the public openly and aboveboard. No other method will insure justice to the utilities, nor should it.

Community Welfare Demands Transportation Improvement*

By W. H. Sawyer

President American Electric Railway Association

THERE was a time when one of the foremost ambitions of the electric railway executive was to induce people to ride the street cars instead of wasting the extra time by walking. Then there was a period when we first commenced to feel the effects of the privately owned automobile, it being first used by the more wealthy. Today one out of every five people has an automobile; a large number of people use their machines to go even a few blocks. Its use is confined not to pleasure riding; it is a necessity. There was a time when many questioned whether the number of automobiles could continue to increase. Today nobody questions but what there will be a continuing increase.

This means that every highway and every street that is to be of any real public use must be paved. It means that the traffic and parking problems are most complicated and pertinent civic problems. It means that there is not today the necessity for public transportation as previously existed, for as large a percentage of our population. It means that the street car riding habit is not maintaining its former rate of increase with the increase in population. This leads many to the erroneous conclusion that the day of the street car is past; that there is no longer the need for public transportation. The thinking man, however, cannot escape the fact that there is still an appreciable number of people who must depend upon public transportation all of the time, and it is also a fact that all of the people need public transportation some of the time. We are therefore confronted with the fact that public transportation still remains a necessity, and unquestionably will continue to remain a necessity. It is also apparent that with the changed conditions and with such acute competition many electric railway lines cannot survive if they are to continue to be operated with the same class of equipment and the same methods which were in vogue fifteen or more years ago. Many of these electric railway lines cannot survive if the communities served are to continue to treat their railways on the same basis as a generation ago.

I will talk later about what the electric railway companies are doing and should do to meet these changed conditions, but let me expand upon the situation which confronts you as citizens interested in the welfare and development of your community.

Noting the congestion of automobiles on the streets and on the highways, it is a natural thought that most people today are traveling by automobiles, but if you take an average important city street car corner you will find that the big bulk of the riders is in the street cars, not in the automobiles. This is due to the fact that practically all checks of automobile traffic show that on one important street there were more than five times as many pleasure vehicles as street cars but that the street cars carried more than twice as many people. Another check on an important thoroughfare showed fourteen pleasure vehicles to one street car, but even then the street cars carried 60 per cent of the total riders. Checks at large department stores and shopping centers show that more than 75 per cent come today by street car. These are typical illustrations, and yet there are those who say that the street car is obsolete and should be thrown into the discard. The important point I want to stress is the fact that the street car carries the bulk of the people and is the efficient transportation vehicle, and this should be taken definitely into account in all traffic regulations, including parking restrictions.

Unreasonable Burdens Restrict Service

There was a time when the electric railway was considered to be fair prey. The fare was fixed at 5 cents and any tax or obligation imposed upon the railway company was assumed to be beneficial to the community. There was a time when it was considered legitimate to force the railway companies to pave between the tracks and 1 ft. outside. Such a tax today imposed upon the car rider is not only unjust but is actually disadvantageous to the community. There must be a realization on the part of not only the public officials but the people generally of the fact that burdens put apparently upon their electric railway company are in reality burdens put upon the car riders, or are burdens which directly affect the ability of the company to furnish needed service.

I have no sympathy for the man who comes to my office and complains of the street car fare. I am all attention and am desirous of co-operating with the man who comes in seeking better service. Even in the case of the street car company which is today making a fair return on a fair value, the community would be the loser if the fare was to be decreased. What is needed from the community standpoint is more and better service. The average street car fare has not increased in proportion to the increase in cost of living, although admittedly the cost of labor, which is the most important item in street car expenses, has more than doubled and we are today operating more seat-miles per passenger than ever before.

Cash Fare Should Be Ten Cents

Also keep in mind that the automobile users are paying several times the cost of the street car ride for the privilege of riding in automobiles. It seems absurd that there should be even a quibble as to 1 or 2 cents difference in the cost of a street car ride when this charge is compared with the cost of operating an automobile, and when the charge is necessary for community progress. I doubt if there is a city in this country that from a community standpoint should not have a 10-cent cash street car fare, although where practicable there could be a lower ticket fare.

Our politicians have in the past too often felt that it would enhance their political fortunes if they could be the instrument through which the street car fare was lowered, or failing in that, if they could prevent any increased fare. There always will be politicians of this class, just as there always will be a certain class of people who are not broadminded enough to want to study a stiuation constructively, but there is undoubtedly a definite tendency toward a realization that transportation problems are technical and business problems to be solved on their merits for the benefit of the community. It is also becoming more generally recognized that the street car company, being a community asset and necessity, must be allowed to charge a fare commensurate with the cost of the service or eventually it will cease to function and the community will be the loser thereby.

There is unquestionably less political agitation against street car companies today than at any time within the last twenty years. We need only to have a thorough understanding of our community problem to arrive at a solution satisfactory to all concerned. There is no class of citizens which has a plainer duty along these lines than you operators of other public utilities. There is also a particular duty which devolves primarily upon you, and that is, to explain some of the fundamental differences between our operation and your operation.

No industry has any higher ideals as to public service than the electric railway industry. No industry is trying more faithfully to carry out those high ideals. You electric light and power operators have for years had money available so that you have been able to do many things for the advancement of community prosperity which the electric railway companies have been unable to do. We electric railway men have a more complicated and more complex problem with our customers than you electric light and power men do. We meet our customers twice a day mostly under disadvantageous conditions which cannot be avoided. It is impracticable to give every passenger a seat during the rush hour. The cost would be prohibitive. We not only meet our customers twice a day, but every time we meet them we must ask them for money. Try as we will it is impracticable for us to give as general satisfaction to our customers, except as there is an understanding of our problems and the limitations inherent to our particular industry.

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*Abstract of an address before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

In many localities there are executives serving in a joint capacity in both industries. The intensity, complexity and the details of the railway problems demand that such executives give just as much time as practicable to the study and solving of these problems, while, comparatively, the electric light and power end is able to progress and go forward to the satisfaction of the community with appreciably less effort on its part. Let me say to you light and power people that our problem is your problem, but above all, it is a common community problem.

Permit me to say just a word about buses. There are few, if any, communities where the bus cannot be used to a greater or lesser extent to good advantage, but the electric car will remain as the foundation stone and backbone of our urban and interurban transportation. With both methods of transportation being used it devolves upon the electric railway operator to study and analyze his conditions so that each vehicle may be used in its proper place to the best advantage. The bus must not be used in direct competition with the electric car, where both are seeking the same class of business in the same territory.

CO-ORDINATION IS REAL PROBLEM

Many of us electric railway operators hesitated too long before we fairly attempted to utilize the bus advantageously. Many of us have made mistakes in attempting to utilize the bus. It is a real problem as to where the bus best fits in and where the electric car best fits in, and it is a real problem as to how the bus can best be co-ordinated with the electric car. Too many of us have operated buses unco-ordinated and that is an economic waste. It is also an economic waste to scrap existing transportation equipment and investment, except as it becomes absolutely necessary to do so. Such confiscation will ultimately react unfavorably on any future transportation investment.

There are still some electric railway men who are not meeting the changed conditions of today in the operation of their electric cars, but a great big bulk of electric railway operators are meeting these new conditions with changed equipment and changed methods, which entitles them to be at least in the category of having done their share toward meeting the changed community condition. It is interesting to note that those companies that have been the foremost leaders in progressive management and utilization of modernized methods and equipment are those companies that are making the best showing on the balance sheet.

No one is excusable for not having adopted progressive methods, but some of us are excusable for not having modernized all our equipment. We know that there are some electric railway lines which will eventually go out of business due to the changed conditions, but we are only part way through this reconstruction period. The dividing line is not yet in all instances clear. We know that those companies and those lines that are to survive must be modernized, and we also know that this will cost an appreciable amount of additional new money.

The number of companies in receivership has been very much decreased; the amount of scrapping has been really inappreciable and the number of companies that have modernized is constantly increasing. By modernizing I mean primarily that we are putting on equipment which has a very much greater appeal to our customers, equipment which is in keeping with the thought and trend of the day, equipment which is probably lighter and faster, and certainly is more attractive, more comfortable and more luxurious, and also more costly. Let me also add that until we have brought our railway equipment and methods up to date we are in no position to pass final judgment on the status of the bus or as to its proper functions when used in a comprehensive co-ordinated transportation system.

Today is a different day. We are living in an age of which the fast, luxurious, costly automobile is symbolical. The changed conditions have materially affected the electric railway industry, but it is still a most vital and essential industry. It must and will go forward. There has been definite, appreciable progress in the solving of its problems. The operators of the industry are striving, thinking, analyzing and constructively working as never before. They are capable, honest and sincere, and giving of the best of their skill and ability to solve these problems which are so vital to our civic prosperity. The industry asks not for sympathy, but it does need and must have constructive co-operation in solving this community problem.

Training Electric Railway Employees for Their Jobs*

By A. J. SARRE
New Orleans Public Service, Inc.

MANY factors contribute to the development and holding of the good will of the public served by a street railway, but the most important factor is a well trained employee.

If, however, we compare the amount of attention that has been given by management generally to the problem of increasing the efficiency of the rolling stock, the improvement of roadway, and power distribution and generating equipment with what has been given to increasing the efficiency of the man power, we will find that the human side has been woefully neglected. We spend time on the improvement of our machines and fail to realize how important it is to spend some time on the man who is going to be responsible for their successful operation. It is interesting to note how willingly any amount of time and study will be invested in the expenditure of a few dollars for a piece of equipment to be absolutely sure to have it just right, and how impatient we get when it is necessary to spend a few minutes explaining a problem to the man who has to handle that equipment.

The cost of training a man for a job has been variously estimated by engineers at from $35 to $600. It costs the New Orleans Public Service about $51.32 properly to train a new man to operate a street car. This is over and above the cost of hiring the man. The contrast between the extreme care given to the selection and installation of equipment and the general lack of consideration and total lack of system in handling the human element is certainly striking and marks us as being most inconsistent. If we consider the proposition entirely from the money side, wherein lies the difference between wasting money on inefficient or inadequate machinery or having it wasted by poorly trained inefficient workers?

INTELLIGENT INTEREST BY MEN NEEDED

Let us consider it now from another angle, that of public relations. The public knows the street railway organization in terms of motormen and conductors, and it is through the words and actions of these men that the public praises or condemns the company. Every act of an employee is interpreted by the public as a reflection of company policy. It does not differentiate between the individual and his employer. The company and its service is judged entirely by the actions of the men who operate the cars. If these men are properly trained in the mechanics of operation and in addition are trained to interpret every phase of operation in terms of effect on the public we can be sure that they will render the right kind of service. There is nothing that will contribute more to building up good will than the service rendered by a properly trained employee who by virtue of his knowledge of the job takes an intelligent interest in doing the job right.

The point that should now be considered is how to organize and carry out a satisfactory training program that will adequately meet the needs of the organization and the basic principles on which such a program must be built. The first basic principle is that the management must be entirely sold on the need and desirability of systematic training for its employees. It means that the management must be willing to pay for such training. The axiom that it takes money to make money holds just as surely in this proposition as it does in any other field of management. The recognition of the need and importance of the right kind of training as well as its value must go from the top down. The stimulus cannot and will not come from the bottom up. The management must be honestly interested in the proficiency of its employees. By an honest interest is meant one that is free of sentimentality. There is nothing as useless as an educational program based on the paternalistic theory that it is being done only to help the workers, that it is entirely philanthropic, that the management does not expect to profit through their improvement. If the results to be obtained are not mutually beneficial, then the program is not sound and is doomed to disaster.

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*Abstract of paper delivered before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

EDUCATION TIED UP WITH OPERATION

The second principle is that the educational program must be definitely tied up with operation. It must not be set off as a side issue but must definitely function as an aid in increasing operating efficiency. Department heads, foremen, supervisors and other line executives must realize that they have a definite responsibility for aiding in providing the right kind of training both for new men entering their departments and for those who have been a long time on the job. The responsibility for having properly trained men on the job must always remain with department heads in charge of operation, but the machinery for providing this training will frequently be the responsibility of some separate department or division. There is one thing, however, that must be kept in mind and that is the fact that carrying out an efficient educational program for the employees of an organization is no inconsiderable task if it is done properly. It will require the same careful study and analysis of operation as is required of the engineer in designing equipment. When an educational program is started without an analysis of organization needs and the setting up of a plan to show what is desired and how it is to be accomplished, there is bound to be a loss of interest, time and money.

It also means an analysis of the individual job of motorman, conductor, supervisor, etc. It means finding out just what the elements are in each job. What are the various things a motorman must do to operate a street car successfully? He must stand in a certain position, otherwise he will work in an awkward manner. There is a certain speed at which a car must be fed, a certain way to apply the air. All of these things must be considered. They must not only be listed in a systematic way, but must be studied from two angles. First, successful operation of the equipment, and, second, from the standpoint of the passenger—each of the operations mentioned has a separate effect on the car as a piece of equipment and on the comfort and safety of the passengers.

The same thing is true of the supervisor or inspector. He must know whether or not an operator is rawhiding his car, because that damages the equipment. He must also understand the effect such operation has on the passenger. He must be able to deal successfully with the passenger whose frame of mind has been upset by some conductor blindly following rules and throwing reason to the winds. He must also know how to interpret company policy to the men on his lines and see that they carry on their work in accordance with that policy. He must know how to handle men to get the best work out of them, and that means a practical working knowledge of human nature. He must know how to maintain schedules—and keep the proper headway between the cars in order to provide adequate service.

If it is known just what operations and practices are to be followed on a certain job, it is an easy matter to check up on the way a new man is being trained by his supervisor or by an older employee. It is easy to determine whether or not he is being thoroughly instructed on all points, and nothing is being missed. It likewise serves as a check on the man who is doing the teaching. Does he really know his job or is he just getting by? Is there anything about it that he is unfamiliar with and where some special instruction might help him? Has he developed any bad operating habits since he was broken in? Is he working in full accord with the policy set up by the company? Putting a new man with one who has been a long time on the job is absolutely no assurance that the new man is being properly trained. The only way to be sure that he gets the training needed is by providing some definite system for supervising and checking the instruction as it is given.

DUPLICATE ACTUAL CONDITIONS

The actual instruction in operation and in dealing with the public should be given under conditions as near the real thing as it is possible to get them. It is much easier for the man to carry the instructions over to the job if he is trained under the same conditions and not on some artificial set-up that does not match with actual operating conditions. The training can be carried out by first having the men break in on special equipment set aside for this purpose under special instructors, or by actually going out on the road under the instruction of a regular line operator from the beginning. It is the practice generally when special equipment is set aside for new men to break in on to put them out afterward under experienced men designated as platform instructors. This is the general plan followed by the New Orleans Public Service, Inc., in training operators.

The training of supervisors must cover not only instruction in operation, but how to deal with the public and the simple principles of management. He must know how to handle men, how to get results at the least cost. It has been customary in the past to pick out some successful operator, promote him to a supervisory position and expect him to make good simply because he knows how to feed a car properly. It was expected that he would just naturally pick up whatever executive training he needed. In most cases he floundered around and after a long series of mistakes, sometimes very costly, managed to get by with some degree of success.

Here again it is necessary to provide a form of training, and one of the best methods that have been devised to date is the foreman conference. The general plan of the foreman conference consists in bringing the men together at regular intervals and having them discuss the different phases of their work under the direction of a competent leader. No books are used. The leader, through the discussion of a series of illustrations based on his experience and cases submitted from the experience of the members of the group, gets them to arrive at definite predetermined conclusions. When conclusions are arrived at in this way by a group of men, they rightfully believe that they are responsible for the decision and stand by it as being correct. A few of the subjects that have been discussed in this way at meetings of the transportation supervisors of the New Orleans Public Service, Inc., are "The Supervisor's Responsibility"; "Co-operation"; "Public Relations"; "Interest"; "Accident Prevention"; "Planning" and "Orders, Records and Reports."

PROPER ANALYSIS DESIRABLE

These meetings are held on company time and are considered just as much a part of the job as is keeping cars on schedule. The men appreciate the opportunity to discuss the important phases of their work with each other and the interchange of experience under the right kind of guidance is of considerable value. Here again the importance of analysis as a means of increasing efficiency is forcibly brought out. Each man is more or less forced to analyze his job in terms of the particular subject under discussion, because when he expresses his opinion on the subject he must be ready and able to defend it. The other members of the group are ready to check him up whenever he goes wrong. One of the most essential factors in the success of the foreman conference work is the confidence of the men in the management. If the management invites them to participate freely and to express their opinion, it must be ready to stand by and actually let the men talk. No man is going to talk freely if he feels that what he might say is going to be used against him in the future, that his suggestions are going to be taken as criticism and resented. If we ask our men to be honest and express their opinions freely in the interest of the organization, we must be honest and fair and not deal unjustly with the man whose opinions do not entirely coincide with ours.

There is still another type of work that is being carried on by a number of companies. This consists of special night courses designed to meet the needs of their employees from a general standpoint. There are at present fourteen different night classes in operation under the supervision and control of the New Orleans Public Service, Inc., for its employees. Eight of these are in practical electricity, four in accounting and two in shop arithmetic.

The instructors are all company men especially selected for their ability, training and experience. They are familiar with the property and can intelligently answer questions in their respective fields that are brought in by the men who are in daily contact with the work. It is very difficult for an outsider to get this information, consequently the company instructor can make the work much more valuable and interesting to those taking the course by the type of illustrations he can offer to explain the theories they are studying. The courses, being under company control, can be designed specially to meet the needs of its men. The average public night school has to take care of people from all types of industries and is forced to generalize in its instruction, leaving it up to the students to make the necessary application. Here again it is essential that such a program be looked upon as mutually beneficial. The employee gives his time and profits thereby, the company stands the expense and should also expect to profit by having a better trained group of men and women to carry on its work.

One of the unfortunate things about the problem of training employees is that we can accurately account for every dollar spent to pay for instructors, books, time away from the job, etc., but we cannot adequately measure the results obtained in dollars and cents. If the good accomplished could be measured in dollars and cents, the total amount would more than likely be staggering in its magnitude. It costs this nation a huge sum of money to provide the necessary facilities for teaching its people to read and write, but what would it cost us if our people did not have these facilities? Can the value of these facilities be determined in dollars and cents? Can the value of a well-trained employee, one who knows his job, is interested in it and knows the real meaning of co-operation, be measured in terms of dollars and cents? It would be extremely difficult to make such an appraisal.

How Far Should We Go in "Dressing Up" Street Cars?*

By J. G. Holtzclaw

Eastern Texas Electric Company, Beaumont, Tex.

BRIEFLY, the answer to this question might well be expressed in the form of another question, namely, "How far shouldn't we go in dressing up street cars?"

Every company is naturally limited by the amount of money that it can logically spend for this purpose, but if this limitation does not exist there is no other limitation except that of reasonableness. No one would be expected to provide facilities of comfort and luxury that are prohibitively expensive, either as to first cost or maintenance. Nor would they be expected to add frills and furbelows which simply make a street car look pretty but do not tend to improve either riding qualities or attractiveness.

There are two fundamental reasons why effort and money should be spent in making our street cars comfortable and good looking: First, for the drawing power of a good-looking piece of equipment. Second, the attitude that good equipment creates in the mind of our patrons as to our desire to give them the best possible ride for their money. Both of these reasons are sound. Some operator might say that the expenditure of money on painting, on seats, no noise-reducing devices, etc., is not a good investment, and that people will ride on a dilapidated piece of equipment just as readily as on a fine looking, up-to-date car. An operator who holds to this belief, however, is losing valuable time and probably a good many dollars.

This is a day of luxury, as undoubtedly all of you have heard a great many times during the past five years, and the working girl who is willing to spend a fourth of her weekly income for silk hose is certainly willing to spend 10 cents to ride in a first-class street car rather than 5 cents to ride in a dirty, rattle-trap piece of equipment on a rough track.

And right at this point enters the soundness of the second reason given, that is, the attitude it creates in the mind of our patrons as to our desire to give good service. The time is here, and has been for some time, when the street railways of the country must reach out for a new fare schedule. Many of them have already done so; others are in the making today. If our patrons feel that we have made an honest effort to give them satisfactory service with well-maintained equipment, they will be in a far more receptive mood to meet our requests for further increase in fare.

Improve Public Relations

One company in the Southwest has been successful, since the last meeting of this body, in obtaining a new schedule of fares through unanimous action of the city government and without the opposition of the people. The outcome of this company's request for increased compensation is one of the outstanding features for the past twelve months in railway circles, and should be a lesson to all of us as to how we should conduct our business if we are to expect the kind of treatment at the hands of governing bodies that we must have if we are to succeed.

This company, for several years past, has foreseen the necessity of increased rates, and its every effort has been toward keeping its equipment and track in excellent condition, properly maintaining its cars, dressing up to every reasonable degree—to the end that its patrons should realize that the proper portion of their money was going into the upkeep of equipment.

Another company in the Southwest has had a program of dressing up, which has extended through the past two years. It is difficult to estimate or even to state positively whether or not this program has resulted in more passengers, because the city in question has been quite prosperous. But in the face of declining railway revenue during the previous four years, this company, during the past two years, has experienced a constantly increasing revenue, and at this time its street car receipts are running approximately 10 per cent ahead of 1926, and 15 per cent ahead of 1925.

Improvements Made

The schedule of dressing up has not been extremely expensive, and every dollar that has been put into this work is being made effective either in appearance or comfort. All cars have been put through the paint shop, and have been painted, both inside and out, in attractive colors, vastly different from the old standardized yellow or green. Different seats have been provided, finished either in leather or some substitute far superior to the old wood slats. The floors have been covered with linoleum, substituting for the old unsightly wood floors, which could not be kept clean by any method. All fittings on the interior of the cars have been nickel plated. Inside frosted lamp globes have replaced the old glary clear globes.

Everything possible has been done to eliminate noise in operation, but right here it is realized that improvement in this respect can be carried still further to a very good advantage. The particular company in question has a program for 1927, involving only a few thousand dollars, but carrying on still further the work which has seemed to bring a noticeable element of success, and it is likely that it will be continued on and on in the fight which all of us are waging, with our backs against the wall, to keep all of our business from being swallowed up by the drastic competition of the privately-owned vehicle on rubber tires.

No one can answer with authority the question which is the subject of this paper, "How far should we go in dressing up street cars?" because no one yet has had sufficient experience to indicate a limitation. It is to be a matter of experiment. The famous Grand Rapids case has met with some degree of success. Whether the expenditure is justified I do not know, but Grand Rapids has made a name in the history of American street railway transportation, and in the mind of its patrons the Grand Rapids company very likely has a position that can hardly be duplicated anywhere.

To sum it up, we have two primary incentives for improvement: First, to get back some of the business which we have lost by giving our patrons a clean, comfortable, attractive vehicle to ride in. Second, building up in their minds the feeling that their street railway company is trying against great odds to provide the public with good facilities, the psychology of which being that when the time comes for you to ask the public to give you more revenue, you will meet with a ready response and a wholesome co-operation rather than the swift kick which has so often been the lot of the poor railway.

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*Abstract of a paper delivered before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

When the American public feels that it is being treated fairly, it generally responds in a similar fashion; and if called upon to erect an idol for national worship, it would probably erect a gigantic figure which it would label, "A Good Sport."

Research Activities and Production Welding Discussed

NUMEROUS contributions were made to a symposium of the research activities in the welding field during the past three years by speakers at one session of a three-day meeting of the American Welding Society held at the Engineering Societies Building, New York, on April 27-29. At another session there was a symposium on production welding, including papers on thermit welding work, by J. H. Deppler, Metal & Thermit Corporation; a discussion on the field for replacing castings by welded structural parts, by J. F. Lincoln, Lincoln Electric Company; recent applications of arc welding to construction of houses and buildings, by C. J. Holslag, Electric Arc Cutting & Welding Company; oxyacetylene welding of furniture, by M. F. Bayer, Simmons Company, and applications of welding to automobile manufacture, by Robert Appleton, engineer of the Pierce-Arrow Manufacturing Company.

The first day was taken up by reports of various welding committees. H. M. Hobart analyzed and discussed the results of tests made by the Emergency Fleet Corporation in connection with arc welding. In the afternoon there was a meeting of the American Bureau of Welding, at which C. A. Adams, director, presided. Research work of the committee was reviewed, plans laid for future investigations, and officers elected.

Following the precedent of last year a dinner-dance was held at the Hotel Commodore on Thursday evening, April 28. At this the newly-elected officers were announced. These are F. M. Farmer, president; J. H. Edwards, senior, vice-president; R. L. Shepherd, Birmingham, Ala., and G. O. Wilson, San Francisco, divisional vice-presidents. J. J. Crowe, New York City; W. H. Gibb, Bay City, Mich.; H. S. Smith, New York City, and W. C. Swift, West Alexandria, Ohio, were elected to the board of directors.

Telling the Company's Story to a New Man*

By C. A. Brann

General Superintendent Eastern Texas Traction Company, Beaumont, Tex.

ABOUT eight months ago I was sent to Beaumont as superintendent of the railway system. I wanted to know, when they asked me to tell the transportation story to the public, "what is the transportation story?" I thought for quite a while about that particular thing, and it occurred to me that we in our industry were giving men jobs rather than seeking men for the industry. We have a superintendent of transportation who does all hiring and all firing. But in our little company we have another proposition which is quite different, and because it has worked out and because I believe in it, I am going to give you my idea of the transportation story as it should be given to employees.

You may agree with this story and then again you may not, but every green man who goes to work for our company—or rather, before he is regularly employed, before he goes to work there—is told this story; is given at least one-half to three-quarters of an hour's talk on the transportation industry. And these are practically the words that I use when I sit across the desk from him and talk to him about our business:

"The people of this community have granted us a franchise, and through this franchise we obtain the right to operate a transportation service in this city. We must carry the people where they want to go, when they want to go. It is our moral as well as our legal obligation to carry them safely on schedule time and courteously. We have a great many rules in this company. There must of necessity be many rules. There is a reason for every rule that we have. If there is no reason for the existence of any rule, we want you to tell us about it and we will get rid of it. But while we have many rules, they are all based on three fundamental principles; that is, that we must so operate our cars that we will carry the people safely, that we will take care of the people in the streets who do not take care of themselves, and that our patrons will want to ride with us again. The street car is not a has-been, it is a thing of today, a thing of tomorrow. The transportation of our city depends upon the good service that we must furnish.

Street Cars Best

"There is no facility that can take care of transportation as well as street cars. Buses are used, are necessary in some places, but will not and cannot displace the street cars. When a circus was in town, we carried 45,000 people on 45 street cars. Now imagine how many buses would be needed to carry that many persons to and from the places they were going to on that day.

"I want you to know this story because there are some people on the outside—I mean outside the company —that feel that the buses have come to displace street cars. They have not. What may happen 25 years from now, you and I cannot tell. But today there is a very definite need for street cars. In this business there is opportunity for you. It is not a thing of the past, but something for the future.

"No matter how many automobiles we get, we cannot conceive of every family having a sufficient number to take every member wherever he or she wants to go when they want to go. So you have an opportunity; you are starting into a business that is a good, clean, square American business. We want clean men with us, men who will treat other employees, the company and patrons with respect and courtesy. We expect and we are entitled to receive from people who expect us to give service a fair return upon the capital we have invested in order to supply the service.

There is no secret about this business. It is open and aboveboard, and I want you to tell this story to the people as we tell it to you. You may go as high as you can and are willing to go. The manager, the division manager, started as you start today. He did not get to the top by standing on the corner and wishing, but by being attentive to his business, by watching his job and knowing his job. We in this business would rather save character than cash, would rather build brains than brawn. The more you learn, the better we like you. The better you get along with the public, the better you get along with us."

We Have Service to Sell and It Must Be of the Best

That is about the story our men get. We tell it to the supervisors and all the transportation men. Or we tell them further that in this business we have something to sell—it is service. We must produce the proper kind of service before we can expect any one to sell it. Therefore if they will see that it is properly produced they will be able to sell it. Do they do it? During the month of March one of our supervisors, unsolicited, went out after his regular work and sold special car business to the amount of $84. During the month of April the same man sold to the amount of $110. He did not get any extra pay for it other than the satisfaction of knowing that he was doing his job well.

Now when it comes down to the discussion of telling the story to the public by advertising means, you can write ream after ream to the newspapers and magazines; but the most beneficial is the story you tell to the public through the service you give and the manner in which you give it.

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*Abstract of remarks before the Southwestern Public Service Association, New Orleans, La., April 26-29, 1927.

New England Street Railway Club May Meeting

HON. LEWIS GOLDBERG, Commissioner of Public Utilities of Massachusetts, will address the New England Street Railway Club at its next meeting, on Thursday, May 12, at the Copley Plaza Hotel, Boston, Mass. "Radio Broadcasting" will be discussed in the afternoon session by C. W. Horn, superintendent of the radio operation of the Westinghouse Electric & Manufacturing Company. The session will convene at 3:30 p.m.

The News of the Industry

Peace Restored in Scranton by New Wage Agreement

The dark clouds that appeared for a time on the horizon of the Scranton Railway, Scranton, Pa., in the nature of a strike threatened by the Scranton Division of the Amalgamated Association have been dispelled and both parties are again bound by contract to provide service for the 100,000 people who use the street car and bus daily.

An agreement was reached on April 25 continuing the old working conditions and authorizing an increase of 1 cent an hour in all departments. The present wage scale, in cents per hour, is as follows: First three months, 57; next nine months, 62; after one year, 65, with an 8-cent differential for one-man operation.

The contract that bound the railway and the Amalgamated Association expired March 31. Negotiations were commenced on March 18 looking toward a renewal of the contract embodying an increase in wages and better working conditions. The demands of the men totaled an additional expenditure of $210,000 a year. Daily conferences were held until March 31, on which date it was agreed to continue negotiations with the view of arriving at some mutual agreement rather than strike. A precedent was established in the Lackawanna Valley when the union men continued daily operations after the expiration of their contract without any definite understanding of agreement or arbitration.

L. F. Harte, business agent of the local union organization, and H. H. Darte, vice-president and general manager of the railway, were the rival leaders in this campaign. J. D. Keator, managing editor of the Scranton *Times*, was responsible for calling several meetings with the idea of further arbitration.

Transportation Before United States Chamber of Commerce

With the new business era as its main topic the fifteenth annual meeting of the Chamber of Commerce of the United States, held in Washington, D. C., May 3-5, went on record as unalterably opposed to governmental interference with business. In his opening address John W. O'Leary, president of the chamber, declared that by self-regulation American business is bringing about a condition which will result in fewer restrictions being imposed upon private enterprise and initiative through governmental regulation.

The outstanding feature of the manufacturers section was the declaration by Arthur T. Morey, general manager of the Commonwealth Steel Company, that America would sell itself to the world by recognizing that every worker was entitled to life, liberty and the pursuit of happiness in its broadest adaptation.

At the meeting of the transportation and communication group the consensus of opinion was that the merchant marine should be sold to private interests as soon as practicable, and that the chambers of commerce throughout the country should in every way assist in exploiting the air mail service. A. J. Brosseau, president of Mack Trucks, Inc., discussed the relation of the bus and truck to city transportation and the railroads. In discussing the matter of competition with the railways from the bus and inland water carriers, George D. Ogden, traffic manager of the Pennsylvania Railroad, said there was a growing demand for all forms of transportation and that it was his belief that what is good for the community is good for the railroads; what is not good for the community is not good for business.

Among other topics discussed were the regulation on the height of skyscrapers, conservation of natural resources and the Mississippi flood situation. In this latter particular the chamber issued a challenge to the engineering skill of America to see that there were no repetition of the present disaster.

The meeting will be reported at length in the ELECTRIC RAILWAY JOURNAL for May 14.

Chicago Men Hear President Sawyer

Stimulating Address Made by Association Head at Annual Gathering of Surface Lines Employees—First Duty Is to Carry Citizens of Community

INSPIRATION for electric railway employees everywhere was contained in an address made recently by W. H. Sawyer, president American Electric Railway Association, before the Chicago Surface Lines Club in annual session. Mr. Sawyer said in part:

Generally I have spoken as president of the American Electric Railway Association from a national viewpoint of our industry rather than from any particular local viewpoint. You are, of course, all interested in the industry nationally, but your particular interest is primarily local to your own company and your own community, and I can confine my remarks primarily to your local situation.

I believe that I am normally an optimist and I like to think and talk optimistically, and, frankly, I have every right to be more optimistic about the Chicago Surface Lines than I have about the average electric railway. Others may be trying as hard as you are trying, but, due to local conditions, are not able to accomplish the results which you are accomplishing. The results nationally are, however, encouraging, especially on those properties which are meeting the changed conditions of today with modernized equipment and modernized methods.

Why is it that Chicago made such a splendid record in 1926? There were many contributing factors. Your management has a distinct realization of the responsibility which rests upon it. It fully appreciates to what extent this community needs transportation. More than that, it appreciates to what extent this community needs electric railway transportation. It has not dodged its responsibility to its community, but has gone forward with a determination to carry on and be the asset to this community that it should be.

I believe that our duty to our community requires that, first of all, we be transportation men to transport the citizens of the community in the most efficient manner at the lowest practicable cost. I say that we should, first of all, be transportation men—not electric railway men—now, that is definite, but too many of us have used buses where we had no business to use them for the best interests of the community, and it is indeed reassuring to note the results where practically no buses have been used.

While the number of passengers on the Chicago Surface Lines increased, the number of passengers carried by the Chicago Motor Coach Lines decreased in 1926. I think that gives a picture worthy of careful thought. This brings me face to face with the disheartening phases of the Chicago situation from the community standpoint. There should have been more buses in operation in Chicago in 1926 than were operated. These buses should have been operated in co-ordination with the electric railway cars, both surface and elevated. I believe in the bus as an efficient transportation tool which makes possible far better transportation facilities than would ever be possible with the electric car alone, but, on the other hand, it is absurd and ridiculous in the extreme to give serious thought to buses attempting to supplant the electric surface cars of Chicago. The electric street car must remain as the backbone and foundation of your transportation system. The electric car is a necessity; the bus is a most helpful adjunct.

There are, however, other situations where under today's conditions the bus can take care of all of the traffic better than can the electric car. This is true in Belleville, Ill., a city of about 25,000 people, where we have discarded street cars and are using buses entirely on the local city lines and are covering with the buses more territory than was previously covered by the street car lines. The electric cars which we discarded never paid their way and it is doubtful whether the buses will pay their way. There are other small communities akin to the Belleville situation, where there is an obligation to continue service, and where the losses with bus operation will be less than with railway operation.

Your street railway situation is a community problem, which should be solved for the benefit of the community. I have a host of friends who are politicians. I find no fault with a man for being a politician, but I say to them and I say to you that this is not a political question. This is a business man's problem, which must be solved for the benefit of your community. I say that every day's postponement in solving this problem is detrimental to your community.

What do the electric railways of Chicago ask in the settlement of this problem? They ask that the problem be so solved that they can secure the money necessary to do those things which are needed for the benefit of the community. That covers all and everything that they are asking. They are not seeking to make an abnormal profit.

It is true that they, in effect, ask an indeterminate or revocable franchise. The underlying theory of the revocable permit is tenure during good behavior. It affords protection to the public and the community served. It permits a permanent financing program. It would prevent receivership of a going concern. Everybody would be benefited. Nobody would be harmed. The railways could, undoubtedly, accept a franchise that was fixed as to time and limitations, but the people of Chicago should not be asked to pay the cost under such a franchise. It would be an economic waste.

Analyze every suggestion which the railways have made in connection with the solving of this situation and you will find that what they are doing is to point out the efficient way by which they can furnish needed, essential transportation to the community, and when the railways object to provisions which politicians desire to inflict upon them, they rightfully object because the community cannot carry that handicap.

Knowing the situation as they do, your railway executives and bankers would not be true to their trust if they accepted these handicaps which would prevent them from furnishing efficient, comprehensive transportation such as this community desires and must have. I have no doubt but that terms could have been arrived at a long time ago if, as has at times been insinuated, the financial interests behind these properties were simply looking for personal financial gain. These men are honest, responsible business men seeking as community builders for a firm foundation to enhance the community welfare.

I review these local conditions because, knowing them as I do, I feel the obligation to point out to you that you have a duty which you should not and cannot escape. You know the facts. You know that the people you are working for are honest; you know that they know what to do and how to do for this community; you know that they are willing to do and you are their representatives, each and every one of you. You are the salesmen who must go out and give the facts and tell the truth to your friends, to your neighbors and to the people of this community.

Your executives, in spite of all they have done and the high opinion you have of them, have certain limitations. They cannot achieve the impossible; they cannot force men who have money to put that money into the transportation needs of Chicago, unless those men having money are assured that their property will not be confiscated and that they are making a wise investment. Every time there is any objection raised to any provision asked for by the railway, analyze it from that standpoint. It is all right to discuss rapid transit extensions and subways. It is perfectly proper to estimate, study and analyze, but before anything real is done toward appreciable extension of rapid transit facilities existing transportation facilities must be co-ordinated and the first step is the placing of the electric surface transportation on a healthy, solid foundation.

Your problems are interesting. There never was a time when there were more interesting problems to be solved in city transportation; there never was a time when there was more need of the maximum of skill and ability in our industry. Today is a different day, and we must have not only different cars, car equipment and different methods, but we must be up on our toes and doing as never before. If we are to meet today's conditions we certainly must think in conformity with the age in which we are living. If there is one excuse more than another that I personally object to—on our own property—it is to be told that they are doing something today because that is the way we always have done it. We most do things today in the best way to meet today's conditions, after analyzing and studying the conditions. Street car riders—actual and potential—are our customers. We must give them not only good service but we must treat them politely and courteously, just the way any good salesman treats a customer or a potential customer. Please do not think that I am assuming that you are not doing these things. All of us need all the inspiration we can get to do the kind of a job that needs to be done. Your company is going forward today because of the co-operation, skill and ability of this group assembled here. You have every right to be proud of what has already been accomplished, and you are particularly fortunate in that you can look ahead to even greater accomplishments. The day must come when the clouds will roll away and the Chicago traction problem will be settled on a basis helpful to your community, helpful to your company and helpful to you personally. The day will come when community welfare will rise above politics.

New Parlor Car Trains for Summer Service Out of Chicago

Increased summer service on the Chicago, South Shore & South Bend Railroad has been provided in a new schedule which became effective April 24. Seventy-two fast trains are now operated between Chicago, Ill., and Gary, Ind., providing half-hour service throughout the day, and 40 limited trains daily between Chicago and South Bend, Ind. The new schedule shows three additional trains between midnight and 6 a.m. Two new parlor-observation car trains were also added, giving patrons parlor or dining car service on twelve limited trains daily.

Wages Increased 5 Per Cent in Brooklyn

Directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., have approved the recommendation of W. S. Menden, president, that he be authorized to modify existing agreements with various groups of employees so as to provide for approximately 5 per cent increase in wages and a two-year extension of the period in which the present agreements are effective. This approval was with the understanding that the increase be made effective as of the first day of the payroll week in which the new agreements are signed.

As a result, agreements making increases in pay effective as of April 15 are made with following groups:

Motormen and conductors of the surface lines.

Ticket agents, conductors and trainmen, and porters on the rapid transit lines.

Shop, power house, substation, line department, track division and building division employees.

The modification of the wage schedules at this time, in advance of their expiration, is due to an understanding that if there were changes in wages by other transit companies in New York City during the year the representatives of the employees would have the right to seek a modification of the agreements as to wages in advance of their termination date. After the recent announcement of the increase in wages for employees of the Manhattan transit companies, the representatives of various groups of B.-M.T. employees requested conferences with the company officials and asked for an increase in the hourly rates of pay.

Agreements providing for an increase in wages of approximately 5 per cent for employees of the Brooklyn City Railroad have also been completed between representatives of the employees and Clinton E. Morgan, vice-president and general manager of that company. This wage increase is effective as of April 15. The new agreements provide that the new scale of wages shall remain in effect until August, 1929.

Surface motormen and conductors of the B.-M.T. now receive 52 cents the first year, 54 cents the second year, 57 the third year, 60 cents the fourth year and 65 cents the fifth year and thereafter. Elevated trainmen receive 52 cents the first year, 53 cents the second year, 55 cents the third and fourth years, 56 cents the fifth year and thereafter. Elevated conductors receive 59 cents the first two years and 60 cents the third year and thereafter. The differential for one-man car operators is 5 cents. The conditions under which the rapid transit motormen work are contained in a separate agreement which has not been altered.

Adjournment of Legislature Menaces Chicago Settlement

If the present Illinois Legislature fails to pass legislation permitting the consolidation of the surface and the elevated lines of Chicago, together with subways and feeder buses, and authorizing the granting of an indeterminate type of franchise and other fundamentals of ordinances now pending before the City Council and tentatively agreed upon by the city and companies, a delay of nearly two years in the settlement of Chicago's troublesome local transportation problem appears inevitable. Even should the expired surface lines franchises be extended again on July 31, needed extensions and new construction would be indefinitely postponed and not even a beginning could be made toward the much-desired subway construction. That is the concensus of opinion now existing both among city officials and traction experts.

With the present session of the Legislature set for adjournment early in June, immediate presentation of the enabling bills must be made. Such action has been forestalled by the failure of the local transportation committee to meet in nearly three months, by the intervention of the mayoralty election last month and by the subsequent refusal of Mayor Thompson to discuss officially any proposal he may have for a solution of the problem. Rumors that the Mayor had reached an understanding with Samuel Insull, president of the Chicago elevated lines, for the consolidation of elevated, surface and bus lines into a unified transit system under the latter's management have been vigorously denied by both men. The purpose of a later meeting between Mr. Insull and Samuel Ettelson, newly appointed corporation counsel, has been kept a secret.

The only expression it has been possible to obtain from Mayor Thompson since his return from his election "victory" tour of the South is that he desires immediate action in the matter and that while he is still inclined to favor his original idea, providing for a transportation district to acquire and operate the surface lines, which was defeated in the state Senate some years ago by a narrow margin, he will consider other plans with an open mind. He has declared that, in any event, the final decision will rest with the people of Chicago, since he would insist on a referendum on any traction ordinance passed by the City Council. He is said to be no longer committed to the municipal ownership theories he once favored.

Seeks to Discontinue Weekly Pass in Terre Haute

In a petition just filed by the Terre Haute, Indianapolis & Eastern Traction Company permission is asked of the Indiana Public Service Commission to discontinue the $1 weekly passes at Terre Haute. The petition says the people of the city abuse the pass by using it to get on the car and then by handing it out the windows to other persons. Besides, confusion resulted from the necessity of making the passes a different color each week.

Arbitration of I.T.S. Wages

William Atkins, United States Commissioner in St. Louis, Mo., has been selected as the third member and chairman of the arbitration board which will consider the matter of a new wage scale for the Illinois Traction System. Hearings will begin on April 5 and will be held in St. Louis, Mo., and Springfield, Ill.

The old contract of the trainmen with the Illinois Traction System expired on Dec. 1, 1926. Prior to that time a committee representing the workers had asked for increases in the wage scale. The company has contended that conditions warranted a decrease.

Failing to agree among themselves, both sides decided to submit to arbitration, as provided in their previous contract. W. L. Perry, St. Louis, was appointed to represent the men and E. E. Soules, Peoria, Ill., was named as the company's representative. They selected Mr. Atkins as the third man.

Pending final settlement the men have continued at work under the old agreement, but any change in wages is to be retroactive to Dec. 1, 1926.

Wage Issue in New York State

Negotiations are still under way between representatives of the New York State Railways and of the employees of the lines in Rochester, Syracuse and Utica, N. Y., looking to a new wage and working agreement for the year starting May 1. No announcement has been forthcoming as to progress save that an agreement had been reached on the working conditions.

The real issue, the wage question, is still being threshed out in conferences. The union is demanding a straight 9 cents an hour increase for all employees in the three cities. Motormen and conductors on city lines now receive 55 cents an hour; one-man car operators, 60 cents, and interurban operators, 58 cents.

The railway has contended that despite increased fares in the three cities, the demands for improvements have increased in proportion and mounting cost of operation prohibits a wage increase at this time.

In the event no agreement is reached by May 1, any settlement made after that date will be retroactive.

Buffalo & Erie Wage Issue to Be Arbitrated

The proposed 10 per cent wage reduction in the pay of platform and other employees of the Buffalo & Erie Railway, which operates an interurban line between Buffalo, N. Y., and Erie, Pa., will be submitted to a board of arbitration as the result of an agreement made by the company and its employees at a conference in Fredonia between Manager MacLeod of the company and a committee of the employees. The men named Harry Solomon, Erie, as their representative on the board, the company choosing H. L. Mack, former vice-president in charge of transportation of the International Railway, Buffalo, as its representative. These two will select the third arbiter. The men will continue at work pending the outcome of the conferences by the board. It was stated in the ELECTRIC RAILWAY JOURNAL, issue of April 30, page 789, that the company had ordered the wage cut effective May 1.

Fares Changed in Tacoma—Weekly Ticket 30 Cents

As the final experiment pending the digestion of the lengthy analysis and report on the affairs of the Tacoma Railway & Power Company, Tacoma, Wash., about to be submitted to the City Council another change in fares was instituted on May 1.

The outstanding feature of the new fare basis will be a new type of weekly ticket costing only 30 cents, which will entitle the holder to as many rides as he desires at 5 cents additional each, with full transfer privileges. The object of this new fare is to encourage added or convenience riding, and thus increase total revenues by selling more service. In addition to the weekly ticket fare, a single cash fare will be 10 cents and tokens will be sold on the cars at three for 25 cents. It is expected that the new fare basis will not mean an increase in the average fare paid by Tacomans. The 5-cent fare zone is eliminated entirely under the new fare plan. Tokens will not be sold at agencies. Cards good for six rides and selling for 50 cents will be discontinued. School fares have been left undisturbed through all experiments.

Agreement between the City Council and the company was reached after the most amicable negotiations. Richard T. Sullivan, manager of the company, first suggested a 40-cent ticket, but finally, upon suggestion of the city officials, amended it to 30 cents. Under the proposed 40-cent price, Commissioner Davisson pointed out, the man who needs twelve rides a week at the lowest fare possible would pay 8⅓ cents per ride under the pass fare.

Manager Sullivan is quoted as saying that the revenues of the last two months have been so low that the company would have to increase the token fare from fifteen to thirteen for $1 if the ticket experiment were not approved. The present fare tariff expires April 30 and it would be necessary under any circumstances for the company to file a new schedule with the state by that date. Under the agreement between city and company for the experimental period, the company would have the right to raise fares because revenues have failed to reach the agreed minimum.

W. Kesley Schoepf Dead

W. Kesley Schoepf, president of the Cincinnati Traction Company, Cincinnati, Ohio, which was succeeded by the Cincinnati Street Railway, identified with the Cincinnati Car Company and other local enterprises for many years, died on the morning of May 6. Mr. Schoepf terminated a period of service of 25 years with the traction company in the fall of 1925. He was always very much in the public eye, but none denied the power of the man as a constructive force that had done much to enrich the local community.

Phoenix Voters Approve Bond Issue

The proposed $750,000 bond issue for the complete rehabilitation of the Phoenix Street Railway, Phoenix, Ariz., was carried at the special election on April 30 by a 95 majority vote. An ordinance calling for the special election and approved by the City Commission calls for the purchase of new cars, rails, ties and other necessities for bringing the present municipal railway up to date. It means the rehabilitation of the entire system. Under the plan the system will be operated for a period of five years before the sinking fund provided to amortize the payment of the principal of the bonds begins to function.

The city of Phoenix acquired the properties of the railway by purchase on June 4, 1925, for $20,000 and assumed direct operation on Nov. 1, 1925.

Lincoln Interurban Authorized to Charge Ten Cents

The Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., has been authorized by the State Railway Commission to increase its car fares to the level charged by its competitor, the Lincoln Traction Company. That rate is 10 cents for cash fares and four tokens for 30 cents, with 2 cents added for rides beyond the 45th Street zone. It has been charging 6 cents cash, with 1 cent additional for zone rides. Its revenues in 1926 from carrying 489,976 6-cent passengers and 308,130 1-cent riders was $32,479. The company was also authorized to make its bus rates the same as its competitior, 10 cents cash, with 2 cents additional for first zone and four tokens for 30 cents.

The commission finds that operation resulted in a deficit in 1926 of $3,206, which is larger than any year since 1923 and $2,500 more than 1925. While revenues have increased nearly $2,000 expenses have gone up $5,500. The company has never paid expenses. The present value of the property is $300,000, not including $89,000 spent for grading a roadway upon which tracks were never laid.

Seattle and Aberdeen Perfect Car Designation Signs

Mayor Bertha K. Landes of Seattle, Wash., has promised that a system of numbering and lettering street cars, so that each car will show more plainly the designation of its route, will be put into effect as soon as possible. The principal complaint now is against the position of the numbers ahead and from one side of the cars. It is proposed to broaden the narrow scope of visibility by placing boxes on top of the cars, with the numbers displayed in large type on all four sides. The cost of putting the boxes on the cars would be $10 a car, it is estimated.

The Grays Harbor Railway & Light Company of Aberdeen, Wash., is also completing a system of designating the cars by colored lights, so that persons wishing to board a car can identify it easily. As soon as the work is finished, each car will carry two colored lights showing the destination.

Seniority Rule Demanded in Seattle

Unless the seniority rule be made effective on the lines of the Seattle Municipal Railway, Seattle, Wash., a tie-up of the railway system is threatened by the local branch of the Amalgamated. If the Civil Service Commission does not accede to the demands of the union a strike vote will be taken. The issue was raised the first of the year, when twenty employees of the municipal lines were laid off, under the combined efficiency and seniority rules in vogue in all city departments. The union head demands that the last man employed be the first to go. Protest was made to the commission, which has finally voted in favor of its present system, with the resultant threat of strike. Tom S. Patterson, chairman of the Civil Service Commission, characterizes the issue as "a tempest in a teapot." He declares the men laid off were slated for the layoff under the system by which an average of an employee's last two efficiency ratings is taken, then a half point added for each year of service up to ten years. He states that nearly all the men laid off from steady employment have had part-time jobs, and will undoubtedly be restored to full time eventually.

News Notes

St. Louis Argument on May 17.—The Missouri Public Service Commission will hear arguments on May 17 on the intervening petitions of the city of St. Louis and University City against the latest application of Receiver Rolla Wells of the United Railways for an 8-cent fare. It is probable that when the case does come up the entire valuation controversy will be gone over again. Special Master William Igoe has advertised the sale of the United Railways properties under foreclosure proceedings for May 25.

A Public Relations "Get Together."—A "Fellowship Dinner" at the Pleasant Valley Country Club, Connellsville, Pa., on March 11 knitted even more closely the relationship between the West Penn Railways and the community life of that section, known as the heart of the West Penn System. The speakers at the dinner told of the beginnings of the corporation's business. It was revealed that the West Penn believed in the future of Connellsville and has testified to this faith by locating more of its staff and operations in that center. The latest contribution is a new terminal station and office building for the West Penn Railways, on which construction is now under way.

Seeks Namesake's Records.—Leningrad, formerly St. Petersburg, Russia, through its city engineer, has sought the records of the city of St. Petersburg, Fla., to be deposited in the town museum. R. E. Ludwig, director of utilities of St. Petersburg, has been asked to send complete data on the municipal railways of St. Petersburg, the number of passengers carried yearly, "tramways and other urban and suburban railway, cargo, wagons, kilometers and casualties." J. Clark, engineer of Leningrad, said that the material on St. Petersburg, borrowed from periodicals and special literature, was insufficient for their needs. Director Ludwig said the data would be prepared and sent by registered letter to Leningrad.

Boston Takes Up Question Fad.—"What do you know about the El?" is a new department of the *Co-operator*, published by the Boston Elevated Railway, Boston, Mass. It consists of 25 questions covering the history and operation of the Massachusetts property. In the April issue 25 more questions supplementing those asked in the previous issue are published, together with the answers to the March queries.

Strike Formally Ended.—The strike of 29 employees of the Danbury Power & Transportation Company, Danbury, Conn., was declared ended on April 26 by the employees. The employees left their places on Nov. 23, 1926, when they were denied a new agreement. Buses have been operated over the company's lines since that time. Practically all the strikers have secured new positions. The vote was merely a formality.

Wages of Trenton Men Increased.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has granted an increase of 5 cents an hour to its employees. The agreement, retroactive to April 1, gives the men a 1 cent an hour wage increase in 1927, an additional 2 cents an hour increase in 1928 and another 2 cent advance in 1929. Previously wage agreements were made for a period of one year only. The three-year progressive increase contract was reached at a conference between General Superintendent Edward J. Peartree and railway employees.

Reorganizing Railway Departments.—The $3\frac{3}{10}$ per cent increase in net earnings of the city of Detroit, Department of Street Railways in March, 1927, over 1926 is explained by Del A. Smith, general manager of the Michigan line, by the fact that approximately 100 employees have been dropped from the payroll during the past 30 days. These dismissals have been in the line, track, mechanical and office departments, and in several instances high ranking jobs have been absorbed by other departments. Among the positions that have been abolished and the work absorbed by other departments are the employment manager, superintendent of traffic and assistant electrical engineer.

New Routes Recommended.—Abandonment of three one-man railway routes of the Washington Railway & Electric Company, Washington, D. C., and the substitution of three other routes were recommended on April 14 by R. G. Klotz, engineer for the Public Utilities Commission. The company has agreed to the proposal and a hearing will be held shortly. In the meantime the commission is planning to obtain opinions from patrons on the proposed changes. Trackage on practically all the lines will remain unchanged. Mr. Klotz said that the present routes never had been considered entirely satisfactory, but had been allowed to continue for several years in order to observe the development of each and so determine what changes finally would prove desirable.

Electrification of Lines Proposed in Maritimes.—Addressing employees at Moncton, N. B., recently, Sir Henry Thornton intimated that the Canadian National Railways would investigate the possibilities of power development in New Brunswick, with particular relation to the Petitcodiac project, in an endeavor to discover the prospects of electrification of lines in the Maritimes.

Newly Painted Cars in Parade.—Ladies in their new Easter raiment this year did not have everything their own way in Baltimore, Md. The United Railways & Electric Company came in for a share of the applause. Several newly painted cars had an important place in the Easter parade that took place on Charles Street, attracting the attention of the thousands who celebrated on Easter. The United is experimenting with color combinations for its cars and the public will decide which it likes best. The cars are being tried out on various lines which operate through the center of the city.

Bargains and Free Rides in Nashville.—Free rides were granted to visitors to the Lebeck Store in Nashville, Tenn., on May 2, when Lebeck Brothers celebrated their 53d anniversary. Special anniversary street cars were run on all lines on a regular schedule. Thousands filled the four spacious floors of the big Lebeck building for the big sale, carried thither by the Nashville Railway & Light Company without discomfort. In addition, any Lebeck customer who desired to drive into town in his car was permitted to park it in the big fireproof Northern garage and leave the vehicle there during the day on as many of the sale days as desired, free of charge the only requirement of this privilege being that the owners are customers at the sale, which comes to a close May 14. Large cash prizes were offered and opportunity was afforded of adding coupons to some worthy charity.

Settlement in Kingston.—Railway lines operated by the Kingston, Portsmouth & Cataraqui Electric Railway in Kingston, Ont., will continue to operate despite the announcement that that would cease on April 30. Through the Board of Trade a conference was held between the Public Utilities Commission and the railway officials and a settlement was reached whereby the commission will pay the railway $15,000 besides crediting as paid all power accounts up to May 1, 1927. Awaiting the settlement the railway has paid no accounts for fifteen months. The $15,000 will be invested and used if necessary in meeting annual deficits in operating expenses or interest on debentures. The company will improve its roadbed and will operate, if the money just paid will allow, until July 1, 1934, when a new agreement and a new franchise will be negotiated. The matter was brought to a head by a demand of the Ontario Utilities Commission for a rate for power of 6.5 cents per kilowatt-hour. The railway refused to consider any such demand.

Recent Bus Developments

Awaiting the Good Old Summer Time in Atlanta

Although the Georgia Power Company, Atlanta, Ga., does not guarantee to make the sandwiches, open the olives or keep the ants out of the pie, it nevertheless has put in operation a plan which is at once a boon to picnickers and a profit maker for itself. That plan is to supply fifteen double-deck coaches, each with a capacity of 60 persons, to picnic parties on afternoons and evenings during the summer at moderate prices. As the company effectively says in advertising its new picnic coach service to the public:

> The big, comfortable coaches mean that your entire party can journey to the picnic grounds together. There's no worry about whether there will be room for Susie in Uncle John's car, or whether she will have to sit on the cake in the tonneau of brother Joe's machine. When you are ready to return, there's nothing to do but load up the coach and start. An automobile large enough for every one makes the party much more congenial and adds just about 50 per cent to the pleasure of the trip.

All that the company asks is that it be notified when the coach is wanted and where the party wants to go, and it will do the rest. Special efforts are being made to rent out coaches for Sunday school picnics and straw rides.

Indianapolis Coach Deal Up on May 9

Formal hearing before the Indiana Public Service Commission on the application of the Indianapolis Street Railway to buy all the assets and franchise rights of the People's Motor Coach Company for approximately $650,000 will begin May 9. Because of the importance of the case, Frank T. Singleton, commissioner in charge, said the entire commission will be present and the hearing will be held in one of the legislative chambers. In the transaction the railway seeks authority to issue ten-year notes amounting to $500,000. These notes are to be sold to raise money with which to buy an equal total of the stock of the coach company. In addition the railway will assume the present outstanding indebtedness of the coach company.

Opposition Expressed to Southern Pacific Bus Plans

Organized bus carriers of California will oppose bus operation plans of the Southern Pacific Company. Arthur H. Samish, secretary manager of the Motor Carriers' Association of California, so stated in Sacramento following announcement by the railroad that it plans to enter the bus field. As announced in the ELECTRIC RAILWAY JOURNAL, issue of April 30, page 790, incorporation papers were filed in Sacramento April 19 for the Southern Pacific Motor Transport Company. The new company has a capital stock of 1,000 shares of no par value. Its headquarters will be in San Francisco. The officers of the corporation have not as yet been announced. The directors are E. J. Murphy, R. R. Cheever, Theodore Wright and T. B. Wilson, San Francisco, and E. H. Gubbins, San Rafael. Southern Pacific bus lines, it is announced, will replace unprofitable branch lines and will act as feeders for main lines.

It is expected that the bus carriers of the state will oppose the granting of certificates of public convenience by the California Railroad Commission at the time application is made if the route in question is in territory already served by bus lines.

Preliminaries of Bus Regulation in Missouri

Preparations to put into effect rules for the regulation of all bus lines operating in Missouri are being made by the Public Service Commission at Jefferson City. Under a law passed by the last Legislature and signed by Governor Baker the commission assumes jurisdiction over the bus lines on July 3. The commission will first adopt a tentative set of rules and regulations and will then hold a series of hearings for bus company officials before the law becomes effective. Hearings on the issuance of certificates of convenience and necessity and on rates, service schedules, routes and equipment will not be held until the law goes into effect.

Seeing Ottawa

The Ottawa Electric Railway, Ottawa, Ont., has announced that its Gray Line is ready to take care of this season's sightseeing business. Twelve de luxe motor coaches provided with especially comfortable seats will be available for this purpose. The Ottawa-Hull, Connaught Rifle Ranges and Gatineau Valley tours will be operated and will be in charge of chauffeurs carefully selected and trained by the Ottawa Electric Railway. The regular sightseeing tour operated daily last summer through the Ottawa-Hull district will commence early in the month and the other tours will be operated by request or on special days.

Hearing Postponed.—The hearing scheduled before the Public Service Commission on May 2 on the petition of the Capitol District Transportation Company, Inc., for permission to increase its fare from 7 to 10 cents has been adjourned to May 11. This is the bus subsidiary of the United Traction Company, Albany, N. Y.

Petition Denied.—The California Railroad Commission has dismissed the application of the Key System Transit Company for a certificate to operate bus service between Oakland and Hayward and intermediate points. The commission held that the proposed operation over the Foothill Boulevard route would mean a loss which the company could not suffer while business was being developed.

Votes for Buses.—The City Council of Eugene, Ore., voted favorably on the substitution of buses for street cars of the Oregon Electric Railway at a meeting held April 18. The franchise is to be advertised for three weeks before the final ordinance is passed.

New Service Given.—Milton Ellis, owner and general manager of the Rockford Public Service Company, recently instituted a bus-interurban schedule which gave Rockford-Chicago passengers a two-hour-and-35-minute service direct to the loop. The buses left Rockford with direct run to Elgin, stopping only at Belvidere, and connecting with the Chicago, Aurora & Elgin third-rail system. As soon as storm damage to the interurban lines is repaired the Rockford Public Service will furnish hourly service to Chicago.

New Use for Bus. — A twelve-passenger de luxe bus to be equipped with parlor car chairs and to be used in carrying passengers between downtown Detroit hotels and the Ford Airport will be bought from Dodge Brothers, Inc., for the Department of Street Railways, under authorization by the Council on April 25. The coach, according to Del A. Smith, general manager of the Department of Street Railways, will be placed in service within 30 days. It will cost $3,800. It will not be run on schedule, but will be used to meet aircraft arriving at the port. Besides its practical use, it would be of value as an advertising medium for the city's interest in aviation.

Employees Paid for Securing Contracts.—The United Railways & Electric Company, Baltimore, Md., has decided to pay a commission to employees who aid in the leasing of chartered buses and de luxe coaches. It is believed that many employees can help measurably in developing this business. Where employees are members of lodges, church organizations, socials, clubs and athletic teams, which take trips at various periods of the year, a word or a bit of effort on the part of an employee may influence that organization to use the company's buses or coaches. These conveyances may be used for visits to Annapolis, Frederick, Belair or any other point. It will not be necessary for an employee to obtain a definite order to secure commission. When inquiries that have been turned in to the Gray Line develop into orders the employee will be given credit for the commission.

No Action on the Substitution by Buses.—Contrary to expectations, the village board of Elmsford did not follow the Tarrytown officials in refusing to grant the petition of the Third Avenue Railway for the substitution of buses for trolleys on the Tarrytown Road between Elmsford and Tarrytown, N. Y. At the last meeting of the board, when the trolley situation was brought up following the joint meeting of the Tarrytown, Elmsford and town of Greenburgh boards, the sentiment seemed to be decidedly in favor of the continuation of railway service, as the cost of sending some 100 children to the Tarrytown school would prove too great a hardship for the parents without the benefit of commutation tickets and school fares.

Financial and Corporate

3 Per Cent Increase in Chicago "L" Traffic

For the first quarter of 1927 the Chicago Rapid Transit Company, operating the "L" lines, carried a total of 58,881,450 revenue passengers. This was an increase of 1,695,616 over the corresponding three months of last year, or 3 per cent. One of the reasons ascribed for the steadily increasing business of the Rapid Transit Lines is the growing congestion on the city streets. The private automobile is becoming less and less a serviceable method of transportation in the city because of the traffic congestion on the streets and boulevards. This is becoming more apparent in a study of traffic on the elevated lines. On the opening of the baseball season on April 12, for instance, the Rapid Transit Lines collected approximately 11,000 fares on the return trip from the ball grounds. This was twice the number registered on the opening day a year ago. The "L" lands its passengers at the gates of the Cubs park and only a short distance from the entrance to the Sox park.

Morristown Property to Be Sold at Foreclosure

Sale at foreclosure of the Morris County Traction Company, Morristown, N. J., in receivership for several years, was decided upon at a hearing before Federal Judge Runyon. An order authorizing the sale will be presented to Judge Runyon for his signature May 20 by Elmer King of Morristown, counsel for the receivers, Joseph P. Tumulty and Joseph K. Choate. At that time the court will appoint a special master to conduct the sale.

Representatives of Chatham, Madison and Dover and a number of judgment creditors attended the hearing. The attorneys for the three municipalities asked whether taxes owed by the company would be given priority, and received an answer in the affirmative. The trolley tracks will be removed. There will be two different sales. The company's real estate in Morris County will be sold at the Morris County Court House, while the real estate in Union County will be sold at Elizabeth. It is intimated that a committee of security holders of the company will make the purchase. Under a plan now in contemplation buses would be substituted for the railway.

Dividend Omitted by Brooklyn City Railroad

The directors of the Brooklyn City Railroad omitted the usual quarterly dividend of 10 cents a share on its capital stock at their meeting on May 3, after having reduced it from 20 cents last January. They believe the earnings should be put back into property, constantly increasing its value. Frank Bailey was elected a director.

H. Hobart Porter, president, in a letter mailed to the stockholders says considerable delay in any proposed financing must result from the Transit Commission's denial of an application to issue $2,500,000 of 6 per cent general and refunding mortgage bonds. Mr. Porter said in part:

"Your directors determined that it was to the best interests of the company that no dividend should be paid at this time. They feel this suspension of dividends will be a hardship to many, but the earnings are being put back into the property, constantly increasing its value, and this will accrue to the benefit of the stockholders."

Receiver for Empire State Railroad

T. C. Cherry has been appointed receiver for the Empire State Railroad Corporation, Syracuse, N. Y. Announcement is made of the appointment of a bondholders' protective committee, of which A. B. Merrill, vice-president of the First Trust & Deposit Company, Syracuse, is chairman. The Empire State Railroad was unable to provide for payment of interest due May 1 on the Syracuse, Lake Shore & Northern 5 per cent bonds secured by first mortgage on the railway property.

Interurban in Ohio Does Well

Cincinnati, Hamilton & Dayton Reports Balance Remaining After Fixed Charges and Depreciation 55 Per Cent in Excess of Estimates Made by Reorganization Committee

RESULTS of operation of the Cincinnati, Hamilton & Dayton Corporation, Hamilton, Ohio, the holding company for the Cincinnati, Hamilton & Dayton Railway, in 1926 were more favorable than had been predicted. Gross revenues from operation were 1½ per cent less than were estimated, but this was more than offset by economies in operation, which brought the operating expenses to a figure 2 per cent less than was estimated. Net revenues from operation available for fixed charges, depreciation and surplus were 3.07 per cent in excess of predictions. Interest chargeable to operation was materially less than had been thought probable, in consequence of which the balance remaining after charges was more than 30 per cent in excess of that estimated. The accrual for depreciation was about 13 per cent in excess of the amount tentatively fixed at first. After deducting this accrual and giving credit for non-operating income the balance remaining over and above fixed charges and depreciation was 55 per cent in excess of the estimate.

INCOME ACCOUNT, CINCINNATI, HAMILTON & DAYTON CORPORATION

March 9, 1926, to Dec. 31, 1926

Operating revenue		
Passenger and special car revenue	$653,014	
Freight and express revenue	170,689	
Miscellaneous revenue	8,759	
		$832,463
Operating Expense:		
Way and structures	$98,270	
Equipment	61,335	
Power	149,562	
Conducting transportation	264,577	
Traffic	4,381	
General and miscellaneous	148,827	
		$726,954
Net revenue from railway operation		$105,509
Taxes assignable to railway operations		29,322
Operating income		$76,187
Non-operating income		2,394
		$78,581
Deductions from gross income		32,152
Net income before Federal income taxes		$46,428
Federal income tax (estimated)		2,500
		$43,928

The Cincinnati, Hamilton & Dayton Railway took over the 86.2 miles of railway on March 8, 1926, following reorganization.

For the purpose of comparing the results of operation in the year 1926 (including the operations of the receiver from Jan. 1 to March 8, 1926, and for the balance of the year) with the estimate prepared by the management and set forth in letters to the bondholders under date of Jan. 20, 1926, the following comparison has been made:

	Actual Results of Operation —1926*	Estimated Results of Operation for 1926 as Set Forth in Said Committee Letters
Gross revenues from operation	$1,015,325	$1,030,000
Operating expenses including maintenance, rentals and taxes (exclusive of Federal income tax)	885,041	903,606
Balance	$130,284	$126,394
Interest on bonds of operating company chargeable to operation	†30,781	50,000
Balance	$99,502	$76,394
Depreciation accrual	45,468	40,000
	2,394	
Non-operating income	$54,034	$36,394
Balance available for holding company surplus and Federal income tax	$56,428	$36,394

* Adjustments were made in the operating expenses of the property from Jan. 1 to March 8, 1926, to exclude therefrom fees of the receiver and his attorneys, capital expenditures improperly charged to operating expenses and certain small non-recurring charges.

† Includes interest on $350,000 first and refunding Cincinnati, Hamilton & Dayton Railway 6s, 1941; $250,000 Dayton Traction 6s, 1931, and $200,000 Hamilton City 6s, 1931, from March 9, 1926, to Dec. 31, 1926, less interest during construction of $8,151.86 charged to capital.

The balance sheet does not reflect the issue and sale, at par and accrued interest, to the reorganization managers of $500,000 par value of the railway first and refunding mortgage 6 per cent gold bonds. The proceeds from the sale of these securities are now held by the reorganization managers and will shortly be made available to the railway. When this transaction is consummated the railway will have nearly

$500,000 in its treasury. The value of "Road and Equipment," shown as $4,675,890, was based upon an engineering appraisal and is believed to represent the minimum sound value for the property.

Additions and betterments aggregating $397,594 were made during 1926. The more important items in this program were as follows:

ADDITIONS AND BETTERMENTS

Pleasant Avenue track reconstruction	$89,581
Freight facilities at Cumminsville	13,294
Freight and passenger conncetions to Delco Light plant	26,273
Purchase of Miamisburg station property	10,000
Initial payment on account of purchase of 60-cycle automatic substation equipment	95,455
Payments to reorganization managers on account of six new cars for Hamilton city lines and fifteen freight box cars and future liability thereon as per balance sheet	89,922
Expenditures by company in connection with ten interurban cars, ten Dayton-Miamisburg cars, one freight motor and 25 freight box cars	25,014
Paving improvements	13,626
Miscellaneous items	26,273
Interest during construction	8,151
Total	$397,594

"Car trust certificates" represent the balance outstanding as of Dec. 31, 1926, on car trust obligations created by the receiver while operating the Cincinnati & Dayton Traction Company and covering certain rolling stock used on the Hamilton city lines.

The "Depreciation Reserve" item in the balance sheet, amounting to $203,097, is made up of reserves turned over by the reorganization managers to the railway in accordance with the decree of the Court of Appeals of Butler County, Ohio, and accruals for depreciation through charges to operating expenses from and after March 9, 1926.

Immediately upon acquiring title the Cincinnati, Hamilton & Dayton Railway launched a comprehensive plan of rehabilitation, additions and betterments. On Aug. 30, 1926, the reorganization managers let contracts for the construction of six safety-type passenger cars for use on the Hamilton city lines and fifteen freight trail box cars, all of which were delivered during 1926. In addition thereto the managers on Nov. 9, 1926; Nov. 12, 1926, and Dec. 18, 1926, placed contracts for ten one-man, two-men passenger cars for use on the Dayton city lines and in the local service between Miamisburg and Dayton, ten passenger cars for use on the interurban line, an electric freight locomotive and 25 additional freight trail box cars. Plans have been formulated for financing a large part of the cost of this rolling stock by the creation of a car trust.

That the company is fully alive to the freight possibilities is shown by the fact that it has enlarged its Cumminsville freight station at Cincinnati and has installed additional steam and less-than-carload tracks.

So much for the results. Now for a little history. The Cincinnati, Hamilton & Dayton Corporation came into existence by virtue of a certain plan and agreement of reorganization for the railway property of the Cincinnati & Dayton Traction Company, dated Oct. 1, 1925, which was declared effective and binding by the reorganization managers on March 4, 1926. Pursuant to the terms of that plan two corporations were organized by the reorganization managers, viz: Cincinnati, Hamilton & Dayton Railway and Cincinnati, Hamilton & Dayton Corporation.

The Cincinnati, Hamilton & Dayton Railway was chartered in Ohio on March 24, 1926, and acquired title to the railway property formerly owned by the Cincinnati & Dayton Traction company, consisting of (a) an interurban line 53½ miles in length, a large part of which is of double track construction, located largely upon private right-of-way, running from the center of Dayton to the outskirts of Cincinnati, passing en route through Hamilton, Middletown, Trenton, Franklin, Miamisburg, West Carrollton, Mount Healthy and College Hill; (b) a branch line from College Hill to Mount Healthy, 3 miles in length, over which only freight service is now rendered; (c) local railway lines serving the city of Hamilton, and (d) two local railway lines (operating in large part over the above-described interurban trackage) furnishing service to a rapidly growing section of Dayton, Ohio. The interurban line traverses the populous and prosperous Miami Valley. The total population of the territory served, including the cities of Dayton and Cincinnati, was 733,030 in 1920. The various cities and towns served by the property are showing a consistent and substantial growth.

The Cincinnati, Hamilton & Dayton Railway had outstanding as of Dec. 31, 1926, the following securities:

Dayton Traction Company first mortgage 6 per cent gold bonds (extended to Jan. 1, 1931)	$250,000
Hamilton City Division first (closed) mortgage five-year 6 per cent gold bonds, due 1931	200,000
Cincinnati, Hamilton & Dayton Railway first and refunding mortgage 6 per cent series "A" gold bonds, due 1941	350,000
60,000 shares of common stock (without par value) constituting all of the stock issued and outstanding.	

In addition the reorganization managers have subscribed at par and interest for a block of $500,000 par value of first and refunding mortgage series "A" 6 per cent bonds and authority for the issue thereof has been secured by the railway from the Ohio Commission.

The Cincinnati, Hamilton & Dayton Corporation was chartered under the laws of Delaware on May 6, 1926, and acquired all of the common stock, without par value (except directors' qualifying shares), of the Cincinnati, Hamilton & Dayton Railway. The Cincinnati, Hamilton & Dayton Corporation has issued the following securities:

$2,125,000	par value prior debenture 6 per cent gold bonds, due Jan. 1, 1976.
875,000	par value adjustment income gold bonds, due Jan. 1, 1976.
20,500	shares of common stock (without par value.)

The reorganization managers were unable to complete their work during the year 1926, hence no balance sheet was included in the report for the Cincinnati, Hamilton & Dayton Corporation pending a final settlement between the reorganization managers and the corporation upon the completion of the reorganization.

Traffic Fare and Wage Figures

Electric railway passenger traffic increased slightly in March, 1927, compared with March, 1926. The month of March, 1926, however, was a very good month for electric railway passenger traffic and showed a substantial increase over the corresponding month in 1925. It is not surprising, therefore, that March, 1927, has not increase very much over the 1926 figure.

The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 217 companies is as follows:

March, 1927	868,973,115
March, 1926	866,604,853
Increase, per cent	0.27

Average cash fare in cities of 25,000 population and over:

	Cents
April 1, 1927	7.8194
March 1, 1927	7.8194
April 1, 1926	7.6653

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100 Per Cent
April 1, 1927	56.97	209.06
March 1, 1927	56.97	209.06
April 1, 1926	56.66	207.93

Fredonia Stub Line to Be Abandoned

Upon evidence that the Buffalo & Erie Railway has not taken in sufficient revenue in eighteen months on its East Main Street stub line in Fredonia, N. Y., to pay wages of its car operators, the Public Service Commission approved on April 22 a declaration of abandonment by the company of that part of the Fredonia line running from Temple Street east along Main Street to the Pomfret town line. The abandonment, according to the order, is not to become effective until July 1, 1927, so that provision can be made by local authorities for the transportation of school children.

New York City Road in Receivership

The Eighth & Ninth Avenues Railway, which split from the New York Railways system when the latter went into bankruptcy in 1919, went into a receivership on May 5. Loss of revenue-paying passengers, increasing taxes and the effort of the federal government to reopen income tax proceedings against the company were given as the causes.

The application for the receivership was made by the American Brake Shoe & Foundry Company. Federal Judge Henry W. Goddard named Nathaniel A. Elsberg and Michel Kirtland as receivers. Joseph Tate, president of the company, said that it had been run at a loss for the last eight years and had been using up its available assets in the hope of relief from an inadequate fare and a crushing burden of taxes.

The Eighth Avenue Railway was formed in 1855 and the Ninth Avenue Railway in 1859. Both companies were leased to the old Metropolitan Street Railway for 99 years, but reverted to their owners when the New York Railways, which had assumed the Metropolitan Company's lease, went into bankruptcy in 1919. The two companies were merged last year. The combined company has more than 26 miles of track and about 200 cars.

Earnings and Traffic on the Increase in Tampa

Earnings in the railway department of the Tampa Electric Company, Tampa, Fla., for the year ended Dec. 31, 1926, increased 19.1 per cent. That this increase had a salutary effect upon the combined departments' gross and net earnings was mentioned by Peter O. Knight, president, in his annual statement to the stockholders.

During 1926 an issue of $1,000,000 of series "A" preferred stock was authorized and offered for sale on Aug. 1. At the end of the year $333,100 of this stock had been sold for cash and an additional $93,700 had been subscribed for payments in installments.

In the early part of the year the $100 par value common stock was split five no par for one.

In 1926 the company expended for maintenance, which is included in operating expenses, 12.2 per cent of the entire earnings of the year, and in addition during this period a total of 17.7 per cent of these gross earnings was set aside for reserves or retained as surplus. The amount retained in retirement reserve at the end of the year and invested in plant was $1,037,710.

The earnings and expense statement for the year was cast in new form with explanations of important items. In the statement on railway operation items are shown as follows:

Transportation earnings $1,279,941

23,920,188 passengers paid $1,270,479 for transportation; the balance of $9,462 came from miscellaneous sources such as special concessions, special cars, and rent of equipment.

Operation—Transportation $687,314

Wages, conducting transportation and miscellaneous items due primarily to operating 4,726,719 car and bus miles.

Maintenance—Transportation $332,202

Wages and materials used in keeping cars, buses, track and other transportation equipment and buildings in efficient operating condition. This item also includes $96,651 accrued for depreciation on street cars and buses.

OPERATING STATISTICS OF THE TAMPA ELECTRIC COMPANY

	1926	1925
Number of street cars owned	158	165
Miles of equivalent single track owned	55.87	55.13
Number of buses owned.....	31	22
Miles of bus routes.........	16.2	16.2

The growth in the number of passengers carried since 1916 is noted in the following table. This list excludes transfer passengers:

1916	10,872,102
1917	11,107,645
1918	11,958,831
1919	14,247,180
1920	15,260,820
1921	17,224,084
1922	17,032,058
1923	16,451,400
1924	16,123,569
1925	21,641,839
1926	23,920,188

Partial Discontinuance in California Authorized

Permission has been granted by the California Railroad Commission to the San Jose Railroad to discontinue railway service and to remove its tracks on its Hanchett Park line. The Peninsular Railway, San Jose, Cal., has been authorized by the Railroad Commission to abandon its franchise and to remove its tracks from portions of Saratoga Avenue, Bellamy Street and Franklin Street in the town of Santa Clara. Both companies are controlled by the Southern Pacific Company.

Sacramento Report Issued.—The Sacramento Northern Railway, Sacramento, Cal., reports to the Railroad Commission its 1926 operating revenue at $1,569,482. The operating expenses, excluding taxes for 1926, are reported at $1,181,297, leaving net operating revenue of $388,185. Taxes charged to operation amounted to $81,824. Deducting the taxes leaves operating income of $306,361 for 1926. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $352,104.

Fordson Franchise May Go to City.—Negotiations have been started which, if successful, will result in the city of Detroit, Department of Street Railways, taking over the Detroit United Railway franchise in Fordson, Mich., which will expire on Nov. 9, 1927. The Detroit United Railway property involved includes 2.65 miles of track on Michigan Avenue. It is understood that the Department of Street Railways has submitted an offer to Fordson, with a promise to build a double track through the city, if it is granted and a satisfactory settlement can be made with the Detroit United. The estimated cost to the Department of Street Railways, including payment to the Detroit United, laying double tracks, paving between tracks and other improvements contemplated, is approximately $138,000. In the event the negotiations are successful the present fare of 11 cents from Detroit to Fordson will probably be reduced.

Abandonment Petition Filed.—The New York & Stamford Railway filed a petition on May 3 with the New York Public Service Commission for approval of a declaration of abandonment of portions of its route in Rye and the town of Mamaroneck, Westchester County. Public hearing will be held on this application.

Would Discontinue Line.—The Berkshire Street Railway, North Adams, Mass., has applied to the Vermont Public Service Commission for authority to discontinue railway service between North Bennington, Vt., and the New York State line. The company has also applied to the New York Public Service Commission for permission to abandon its line between the Vermont State line and Hoosick Falls, N. Y. If the petitions are allowed the Hoosick Falls-Bennington line will be closed to railway service except from Bennington to North Bennington in Vermont. The road was constructed in 1898 and of recent years has developed into a non-paying proposition.

New Director of Cities Service.—M. H. Aylesworth was elected a director of the Cities Service Company, New York, N. Y., at the annual meeting of stockholders. Last fall Mr. Aylesworth was made president of the National Broadcasting Company, Inc. Before that he was managing director of the National Electric Light Association.

Service in Peterborough Ceases.—Negotiations between the city of Peterborough, Ont., and the Hydro-Electric Power Commission looking toward the sale of the Peterboro Radial Railway System failed and service has ceased. It is claimed by the Hydro-Electric that the railway is operated at a loss of $50,000 a year. The city offered $150,000 for both railway and gas works. The price set by the Hydro-Electric is $575,000 for the two. It is believed an offer will be made to a private bus company. If the Hydro-Electric fails to operate cars for 90 days the franchise lapses.

Small Road Bought.—Announcement was made on April 12 of the purchase of the Maysville Street Railroad & Transfer Company, Maysville Gas & Electric Company and all other holdings of the Maysville Public Service Company, with the exception of the water plant, by J. P. Mathews, general manager of the Kentucky Power Company, Augusta, Ky., a few miles east of Maysville, Ky. The railway covers 4 miles of line. The Maysville properties had been controlled by the Cochran family of Maysville for 50 years or more. It was reported that the deal, which included the Maysville & Flemingsburg Light & Power Company and Maysville Ice & Cold Storage Company, involved about $2,000,000.

California Company Makes Report.—The Petaluma & Santa Rosa Railroad, operating from Santa Rosa to Petaluma and Sebastopol, reports to the California Railroad Commission its 1926 operating revenue at $611,280, compared with $571,330 for 1925. The operating expenses, excluding taxes, are $454,531 for 1926 and $432,602 for 1925, leaving net operating revenue of $156,749 for 1926 and $138,728 for 1925. During 1926 taxes charged to operation were $34,394 and $26,799 for 1925. Deducting the taxes leaves operating income of $122,355 for 1926 and $111,929 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectable revenue and rents. The gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, is $125,607 for 1926 and $116,024 for 1925.

Traffic Shows Decrease.—The United Railways, St. Louis, Mo., carried 1,314,556 fewer passengers during the first quarter of 1927 than in the similar period of 1926, the figures being 63,371,709 and 64,686,265 respectively.

Legal Notes

FLORIDA.—*Proof of Fraud in Releases Must Be Convincing.*

It is the policy of the law to encourage and favor the compromise and settlement of controversies, when such settlement is entered into fairly and in good faith between competent parties, and is not procured by fraud or overreaching. In order to accomplish the impeachment as for fraud, of a release so executed, proof of the fraud should be clear, cogent, substantial and convincing. [Florida East Coast Ry. vs. Thompson, 111 So., 525.]

KANSAS.—*Conductor Should Protect Passengers from Assault.*

Plaintiff on entering street car stood alongside of a seat which was occupied. As one part of the seat became vacated, she attempted to sit down. Passenger occupying other part of the seat told her she could not sit there. She sat down and passenger struck her, knocking her across the aisle. She got up, went back and sat down again. The man again struck her with his fist. She got up, went to sit down again and the man struck her for the third time. The conductor stood facing her, only 8 ft. away. After being struck the third time the conductor took hold of her and threatened to call a policeman. Nothing was said to the passenger who had struck her. The conductor took the plaintiff away and the passenger who had struck her left the car. The court, in censuring the conduct of the conductor, held that the law required him to exercise diligence to protect passengers from unprovoked assault and battery by fellow passengers, and when another passenger used force to prevent the plaintiff from exercising her privilege to occupy a vacant seat it was the conductor's duty to protect her. [Holmes vs. Fleming, 253 Pac., 224.]

MAINE.—*Truck Driver Must Listen and Look Also.*

A driver of a motor truck colliding with a trolley car must establish not merely negligence of defendant but his own freedom of contributory negligence. While motor trucks and trolley cars have co-extensive rights and reciprocal duties at street crossings, close watch is required on the part of the motorman. Likewise it is the duty of the driver of a truck also to look, and where he did not do so, but only listened, his failure so to look when his truck was proceeding at a slow rate of speed and could have been stopped in a short distance was contributory negligence barring recovery. [Blanchette vs. Waterville, F. & O. Ry., 136 Atl., 116.]

MARYLAND.—*Proximate Cause of Accident Was Intervention of Automobile.*

Plaintiff was waiting for a street car. As it approached him it failed to stop and he was struck by an automobile going in the same direction, which knocked him into the car. It was held that the failure of the motorman to slacken his speed was not negligence and that the intervention of action of the automobile driver, rather than the motorman's failure to stop the car, was the proximate cause of the injury. [United Rys. & Elec. Co. of Baltimore vs. Perkins, 136 Atl., 50.]

MASSACHUSETTS.—*Rules on Interstate and Intrastate Transportation.*

Appellant was the owner of a number of omnibuses engaged in passenger transportation, both interstate and intrastate, the same buses being used on the entire route. The intrastate carriage constitutes a substantial part of its business. Under the state law operation is prohibited where transportation is similar to that afforded by a railway along the route on which the vehicle is operated or as a business between fixed and regular termini, without first obtaining a license from the city or town, and operation under such license is prohibited until the owner has obtained from the department of public utilities a certificate of public convenience and necessity. No license or certificate is necessary if such carriage be entirely interstate. Power to restrain such operation is vested in the Supreme Court and Superior Court jurisdiction in equity, on petition. Appellant has no such license in the cities where its route parallels that of the street railway and such operation has resulted in financial loss to the latter, who has caused appellant's drivers to be arrested and prosecuted and intends to prosecute them for operating without obtaining the licenses and certificates required by statute. Appellant attempts to restrain the enforcement of the statute on the ground that it conflicts with the commerce clause of the U. S. Constitution and the Fourteenth Amendment. The record contained no information as to the number of passengers carried in the same vehicles and what part of the total number was interstate or intrastate, nor that the two classes of business are so commingled that the separation of one from the other is not reasonably practical. It was held that appellant may not evade the act by the mere linking of its intrastate transportation to its interstate or by the transportation of passengers by the same instrumentalities and employees; that there is no support for the contention that the act deprives it of its property without due process of law and that the state has the right and power to regulate the use of its highways so long as it does not directly burden or interfere with interstate commerce; plaintiff has no standing to attack the statute as a violation of the due process clause. [Interstate Buses Corp. vs. Holyoke St. Ry. Co., et al., 47 Superior Court Rep., 298.]

NEW JERSEY.—*Damages for Injuries to Children Held Not Excessive.*

The sum of $15,000 for weak-minded three-year-old boy losing one leg, with injury to the other, and $7,000 to father, held to be not excessive. [Ketterer vs. P. S. Ry. Co., 135 A., 679.]

NEW JERSEY.—*Attempt by Town to Regulate Rate of Fare Declared a Nullity.*

Under an ordinance passed in 1921 a fare of 10 cents was allowed to be charged for the carrying of passengers by omnibuses on Sundays. Under an amendment to the ordinance passed in 1926, an attempt was made to fix all fares at 5 cents. Prior to the amendment and in 1924 the Legislature had passed an act vesting buses under the control of the Board of Public Utility Commissioners, and this control included the fixing and regulation of fares to be charged. The prosecutors, all of whom were in the employ of a company operating buses, had been fined for collecting the 10-cent fare. The court, in setting aside the convictions, held that the act of the legislature divested the town of its power to fix and regulate fares and that its attempt to adopt the amendment was a nullity. [Morrison, et al., vs. Town of West New York, 136 A., 175.]

OHIO—*Time Allowed to Provide Convenient and Necessary Service.*

Where the Public Utility Commission finds that a motor transportation company does not give convenient and necessary service upon a certain route, it should give to the company a reasonable time, not less than 60 days, to provide such service, before it grants permission to a competing motor transportation company to extend and increase its service upon the route in question. [Central Ohio Transit Co. vs. Public Utilities Commission of Ohio, 154 Northeast. Rep., 323. (See also Scioto Valley R. & P. Co. vs. Public Utilities Commission of Ohio, 154 Northeast. Rep., 320.]

RHODE ISLAND.—*Employees Not Guilty of Negligence Because Man Is Struck While Lying Prone on Ground at Night.*

Defendant's trolley, proceeding between 20 and 25 miles an hour, between streets on a rainy night, struck and killed the plaintiff. There was testimony to the effect that the headlights of the car could be seen for a distance of 600 ft. and it was making considerable noise; that as the car was proceeding, the motorman, and another employee who was also in the front part of the car, saw something on the ground close to the track; that at first neither could see what the object was, but within a second or two they saw a man with his back toward the trolley car, prone on the ground on his hands and knees. The car immediately slowed down and the operator did all that he could do to make a quick stop, but before a full stop could be made the man was struck, receiving injuries resulting in his death. The car was 40 ft. long and stopped in less than its length. At the conclusion of the evidence a verdict was directed in favor of the defendant, which was affirmed on appeal on the ground that there was no negligence on the part of the motorman, as the evidence clearly disclosed that he did all that he could have done to avoid the accident as soon as he saw there was any danger. [Caporicci vs. United Elec. Rys., 136 A., 11.]

Personal Items

A. B. Paterson Heads Southwestern Section

Vice-President of the New Orleans Public Service Company in Association Post

A. B. Paterson, newly elected chairman of the railway section of the Southwestern Public Service Association, is of the younger type of utility executives rapidly forging to the front and taking the lead in the readjustment of electric railway operations to meet present-day conditions. As vice-president of the New Orleans Public Service Company, "Pat," as he is best known among his associates and friends, is in direct charge of operations not only of the railway property in the South's "Queen City" but of gas and electric services as well.

A. B. Paterson

The new railway section head is an engineer. His fingers are on the pulse of each department's activities. His ability and knowledge are recognized by all with whom he comes in contact. But there is no engraved diploma over his desk. If he has one he has never let it be discovered. One senses that he is largely "self-made." There is about him something which gives the impression of years of study after working hours, of the determination which wrests technical knowledge out of books and the hard knocks of experience while the world is busy with recreation and sleep.

Mr. Paterson was born just outside of Toronto, in Canada, 43 years ago. He is an adopted rather than a native son of the South, but nearly twenty years of his experience has been gained below the Mason and Dixon line. He first attracted attention in the utility field while doing special field work for Henry L. Doherty & Company. He became vice-president and general manager at Meridian, Miss., but continued to do special field work for Mr. Doherty. Later he joined the forces of Newman & Company, acting as representative on various Southern properties.

It was during this period that "Pat" gave considerable attention to the New Orleans utilities and became intimately acquainted with these properties. In 1920 he was appointed general superintendent and held that position until the death of A. L. Kempster, when he was put in charge of all operations as vice-president and general manager. Under the leadership of H. B. Flowers, president, Mr. Paterson has welded the New Orleans organization into a loyal, enthusiastic team.

"Pat" is not much in the limelight. He shuns publicity and shrinks from a camera. He is a silent worker and is known for his accomplishments rather than his exploits on the platform. But he is intensely human—and he has a hobby. Pat is an inveterate fisherman. During the season when the finny tribe tempt line and net he sometimes omits his Sunday morning conferences with department heads and lays down slide rule and operating report to try his hand with the sportsman's rod.

His election as chairman of the railway section was accompanied by little demonstration, but there was a feeling of confidence as he took the helm—a feeling that the new pilot knows his job; that the affairs of the railway section are in the hands of a capable leader.

L. M. Zapp Succeeds E. J. Burdick

L. M. Zapp has been appointed vice-president and general manager of the Detroit United Railway, Detroit, Mich. He succeeds E. J. Burdick.

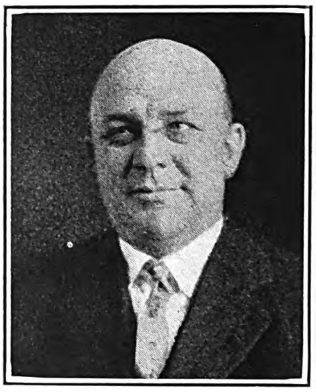
Messrs. Sloan, Gadsden and Brosseau C. of C. Directors

Matthew S. Sloan, president of the Brooklyn Edison Company, has been nominated a member of the board of directors of the Chamber of Commerce of the United States. He will be unopposed, so the election is a perfunctory matter. In addition to Mr. Sloan, new directors elected were: William Pfaff, New Orleans; Robert P. Lamont, Chicago, and Edward Peck, Omaha.

In addition thirteen members who have been serving as directors were re-elected for new terms. They are: Stanley H. Bullard, vice-president of the Bullard Machine Tool Works; Philip H. Gadsden, United Gas Improvement Company; William Candler, vice-president Atlanta-Biltmore Company; J. G. Leigh, L. B. Leigh & Company; E. T. Meredith, Meredith Publications; Dwight B. Heard, Dwight B. Heard Investment Company; Everett G. Griggs, president St. Paul & Tacoma Lumber Company; Charles W. Lonsdale, president Simonds-Shields-Lonsdale Grain Corporation; John G. Lonsdale, president National Bank of Commerce; Walter M. Daniel, Havana; H. A. Smith, president National Fire Insurance Company; A. J. Brosseau, president Mack Trucks, Inc., and A. L. Humphrey, president Westinghouse Air Brake Company.

New Supervisor of Accident Prevention in Chicago

William Pasche has been appointed supervisor of accident prevention of the Chicago Surface Lines. He succeeds Victor T. Noonan, resigned. Mr. Pasche has been with the company since 1904. He began as a conductor working out of the Division carhouse. In 1918 he was made supervisor and his work in that capacity attracted so much attention that he was promoted to the position of assistant division superintendent five years later and stationed at North Avenue. In 1925 he succeeded to the position of division superintendent at North Avenue, which is the largest carhouse on the system. He has won frequent commendation from the management by the efficient way in which he has operated the 600 runs and managed the 1,400 trainmen and 414 cars under his supervision. Last year his station won the trophy in the accident prevention contest, which extended over a period of twelve months. The initiative and resourcefulness he exercised in this campaign proved to the management that he was capable of taking charge of all the accident prevention work on the system and when, through the resignation of Mr. Noonan, the opportunity arose Mr. Pasche was immediately selected.



William Pasche

Frank W. Shappert and L. E. Butler Recent Appointees

Frank W. Shappert, formerly general traffic manager of the Chicago, North Shore & Milwaukee and the Chicago, South Shore & South Bend railroads, was appointed recently to the position of assistant to Bernard J. Fallon, vice-president in charge of operation of the two lines. Mr. Shappert is especially charged with the development of plans for increasing traffic.

Another important change in the North Shore organization is the appointment of L. E. Butler as assistant to C. E. Thompson, vice-president. He will be responsible for rates, divisions and tariffs, and relations with individuals and other transit companies.

W. S. Finlay, Jr., Heads West Penn Electric

Former Vice-President of American Water Works Made President of Large Utility—H. L. Mitchell President of West Penn Railways

W. S. Finlay, Jr., for the last seven years a vice-president of the American Water Works & Electric Company, Inc., has been elected president of the West Penn Electric Company and chairman of the board of its major operating subsidiaries, the West Penn Power Company and the West Penn Railways. G. M. Gadsby, for many years identified with the West Penn Electric properties and lately a vice-president of the West Penn Power Company, has been elected president of the latter corporation, while H. L. Mitchell, the present vice-president of the West Penn Railways, has been elected president of that company.

R. B. Keating has been elected vice-president in charge of finances of the West Penn Electric Company and will supervise the finances of all of its operating properties. Mr. Keating has, for the past thirteen years been prominently associated in various financial capacities with the West Penn Electric properties, prior to which time he had had a wide public utility experience.

Mr. Finlay has long been identified with public utility properties. For some years before his association with American Water Works & Electric Company, Inc., he was superintendent of motive power of the Interborough Rapid Transit Company, New York City. He is a member of the American Engineering Council, United Engineering Society and Engineering Foundation, past vice-president of the American Society of Mechanical Engineers and a fellow of the American Institute of Electrical Engineers. Mr. Finlay will move from New York City to Pittsburgh, the central office of the West Penn Electric System. He was graduated from Cornell University in 1904.

G. M. Gadsby, the new president of the West Penn Power Company, was graduated from Marietta College, Marietta, Ohio, in 1906, and from the Massachusetts Institute of Technology in 1909. Immediately thereafter he started work with the properties now controlled by the American Water Works & Electric Company, Inc. In 1918 he became vice-president of the West Penn Power Company and has since served in that capacity. Mr. Gadsby is a past-president of the Pennsylvania Electric Association and as its head was active in stimulating better relations between utilities and the public. He is also a member of the Engineering Society of Western Pennsylvania and the Association of Iron and Steel Electrical Engineers; he is well known throughout the territory served by the West Penn Electric System.

H. L. Mitchell, who has been elected president of the West Penn Railways, has devoted his entire working life to the railway properties of the West Penn Electric system. He received his schooling in Warren, Pa., and entered the employ of the West Penn Railways in 1902. He was elected vice-president of the West Penn Railways in 1920. Mr. Mitchell is vice-president of the Pennsylvania Street Railway Association and an associate member of the American Electric Railway Association.

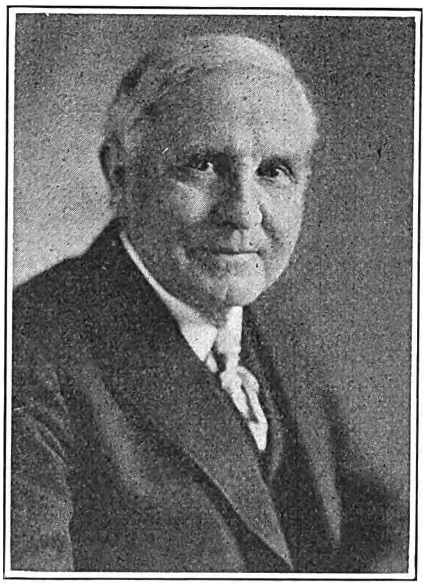
The executive changes outlined previously are a final step in the co-relation and co-ordination of the subsidiary electric and transportation properties of the West Penn Electric Company. The major companies of the West Penn Electric system are: West Penn Power Company, West Penn Railways, Monongahela West Penn Public Service Company and the Potomac Edison Company.

The population served totals more than 1,600,000 in western Pennsylvania, northern West Virginia, western Maryland and northern Virginia, as well as a small portion of the southeastern section of Ohio.

Father of Interurban Dead

Charles L. Henry, Pioneer Operator, Active Until Almost the Last—Man of Charming Mien Who Won for Himself the Appellation of "Engineer of Good Will"

THE passing of a man like Charles L. Henry, who died at his home in Indianapolis, Ind., on May 2, invests with reality Carlyle's complaint that more good lives are lived than written.



Charles L. Henry

Mr. Henry was making history in this industry when most of those of the present generation were in swaddling clothes, and he continued to make history almost until his dying day. This he did unobtrusively, never seeking the limelight. He worked effectively and fearlessly, but always fairly. Unchanged by his successes, Mr. Henry was equally unchanged by his defeats. And he tasted bitter defeat. Twice was his fortune swept away. That made no difference in the outward demeanor of the man. These observations are merely specimen bricks that show the hardihood of the man who was the father of the interurban railway and held at one time the most important office within the power of the industry to bestow, that of president of the American Electric Railway Association.

To this office, filled by him in 1915-1916, Mr. Henry brought a great store of experience, for he had a record of success in the practice of law, had owned the Indianapolis *Journal*, served usefully as a member of the Indiana State Senate and as a member of Congress and was nationally recognized as one of the notable pioneers of interurban electric railway development. It was he who gave the word "interurban" to the language. For more than 35 years he was foremost among the keen-visioned in community building by amplifying rapid transit facilities. He was a pioneer not only in the building of railways, but in the application and use of new methods. The road of which he was long president, the Indianapolis & Cincinnati Traction Company, was one of the earliest successful single-phase systems in the country. His service at Washington in the interests of the electric railway industry during the war-time period was notable. General George H. Harries said of him at Chicago in 1922 at the past-president's day at the meeting of the association that Mr. Henry had kept the industry straight federally and tried to keep the federal authorities straight—with gratifying success. On that memorable occasion General Harries concluded his remarks about Mr. Henry with these words: "His personal charm and our gratitude bind us to him, and always will."

For 37 years Charles L. Henry was a factor in the railway world. He was graduated from the law school of the Indiana University in 1872. He was then 23 years of age and he practiced in Pendleton, Ind., and Anderson, Ind., until he began his connection with the railway industry, nineteen years later. He entered the industry by purchasing the local line at Anderson and made it the nucleus of the far-flung system of the Indiana Union Traction Company. That was a long time ago. Only to the so-called old-timers does the recital of these facts stimulate memories of that now imaginary aroma of the stables and barns that were really barns, and of reeking harness which was as frankincense and myrrh precious to the nostrils of the railway presidents of the distant days in which pine tables served for presidential desks and drivers were paid $1 for a fourteen-hour day; in which the books of accounts were kept by bright lads who labored after school hours for $2 a week and deemed themselves to be well on the way to great riches. It is fascinating to reminisce, particularly fascinating in the case of a man like Mr. Henry, but his life was replete with so many activities that the story of the man would quickly get out of bounds if the attempt were made to elaborate the facts. This is unfortunate, but it is true. The history of a man active in affairs for more than 35 years cannot be covered even cursorily within the limitations which are laid down by the laws of journalism.

Mr. Henry coined and applied the name interurban to the new lines in Indiana. As indicated before, his venture at Anderson was the beginning of the now famous Union Traction Company, formed in 1899 to combine electric railways that had sprung into existence following the success of Mr. Henry's pioneer line from Anderson to Alexandria. Subsequently, as general manager of the company, Mr. Henry constructed the line from Muncie to Indianapolis, forming the backbone of the system as it exists at the present time. Later he disposed of his interest in the company to form the Indianapolis & Cincinnati Traction Company.

All of his activities during his long and successful career centered in or about Indiana, his native state, but his every instinct was that of the pioneer who avoided the beaten trail. It may appear strange to say so, but it does seem that the best characterization of his personality was that contained in a testimonial presented to him about ten years ago by a committee of engineers. It said: "Charles Louis Henry, loved by us all for his unfailing delightful personality, consummate tact, nice discernments and ready power of appreciating and doing that which is required, is hereby elected to the degree of engineer of good will." That was the encomium bestowed upon a man educated in the law, who had become a financier and had acquired an uncanny grasp of the essentials of engineering, in which he had become a pioneer through the backing which he gave to the men with whom he was associated.

In somewhat similar vein is the memorial on the death of Mr. Henry, adopted at a meeting of electric railway men convened during the session of the Chamber of Commerce of the United States at Washington May 3, 1927, attended by President Storrs. That memorial said:

> With profound sorrow and deep regret, representatives of the electric railway industry, assembled at Washington, learn of the death of Charles L. Henry. A pioneer of electric railways, a past-president of the American Electric Railway Association, for years the chairman of the association's committee on national relations and its able counsel. Mr. Henry had been a powerful factor in the development of the industry. He brought to his work a wide experience gained as a lawyer, a member of Congress, a newspaper publisher and a citizen.
>
> A man of intense loyalty, of unusual intelligence, of cool judgment and of understanding, he laid the industry under a deep debt of gratitude for services performed. His genial, lovable nature, his innate kindness and his genius for friendship endeared him to his host of friends.
>
> By this memorial, we record our sense of the loss that we have sustained in the death of one who has been a friend and mentor to us as individuals and a tower of strength to the industry which we represent.

No amount of vigorous phrasing would add materially to this record. Suffice it to say, in conclusion, that the quiet power and the unrevealed glory of this man, to whom the law was not anything that's boldly asserted and ingeniously maintained, are not within the comprehension of fatuous Philistines of the present day.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Substation Equipment Ordered by Milwaukee Railway

A contract for substation equipment has just been closed by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., with the Westinghouse Electric & Manufacturing Company. This contract calls for two 1,500-kw. and two 500-kw., 60-cycle railway converters, transformers and automatic switching. The equipment will be used to supply 600-volt direct current to the street railway system, which is to be changed over from the present 1,200-volt operation.

This last move completes the changeover of the entire system to 600-volt operation. The equipment included in this order is to be used on what is known as the East Troy and Burlington branches of the system. Due to the length of these branches, it was necessary to build five new substations in order that sufficient power could be supplied at the reduced voltage. The equipment included in the above order will be used in these stations, together with some that was in possession of the customer at the time the changeover was made.

The automatic switching supplied on this order includes equipment for the full automatic control (undervoltage starting and light load stopping) of the five new 500-kw. substations on the East Troy and Burlington branches.

The two 1,500-kw. railway converters included in this order are to be installed at the Thirty-sixth Street station and the Oakland Avenue station, each one of which will be full automatic controlled. In addition these two stations are to be equipped with Westinghouse audible type supervisory control equipment. Control and supervision of seven feeder circuit breakers, two lockout relays and two signal circuits at the Thirty-sixth Street station and six circuit breakers, two lockout relays and two signal circuits at the Oakland Avenue substation will be accomplished with this equipment.

On completion of this installation the Milwaukee Electric Railway & Light Company will have seven substations under full automatic control using Westinghouse switching throughout.

In this connection it is interesting to note that the Lisbon Avenue substation of the Milwaukee company recently placed in operation an automatic, nonattended, alternating-current substation controlling two incoming lines, two transformer banks and five three-phase feeders, operating as fifteen single-phase feeders. All switching of lines, transformers and feeders is completely automatic and functions according to operating requirements. The switching equipment, standard relays on which the automatic features depend, and the reclosing relays for controlling each of the feeders were furnished by the Westinghouse company.

The Grandville substation of this company, which steps down line voltage from 132 kv. to 26 kv., has been recently changed over to a non-attended substation with Westinghouse synchronous visual supervisory control equipment. The switching equipment for this station is also of Westinghouse manufacture.

Exhibits Are Silent Salesmen

Remember to have one on at Cleveland, when the

A.E.R.A. Meets in October

Reserve Your Space
Between May 16 and June 15

$500,000 for Gas-Electric Cars for St. Paul

Expenditures of more than $425,000 by receivers for the Chicago, Milwaukee & St. Paul Railroad for the most modern type of gas-electric cars were approved April 16 by Judge James H. Wilkerson of the federal district court of Chicago. Orders for the new equipment have not yet been placed, but it is understood it will be used to replace steam service on branch lines in the Western states.

Work Commenced on New Repair Shop for Cincinnati Company

Work on a new repair shop for the Cincinnati Street Railway began April 25. The new shop, estimated to cost more than $500,000, will have a floor area of 147,920 sq.ft., with a separate building for housing the stores department of 23,250 sq.ft. It will be located on property already owned by this company on Mitchell Avenue and the Baltimore & Ohio Railroad, the site being easily accessible from all sections of the system. Preliminary plans were prepared by E. J. Jonas, superintendent of equipment, and architectural details were completed by Col. Harry Hake. The contracts were placed with the Fisher-DeVore Construction company of Cincinnati. Brick and steel will be used for construction, while the roof will be the flat monitor type. The shop is to have a capacity for handling work on 60 cars at one time, which is 10 per cent of the cars in regular operation. It will also be possible to paint all cars as frequently as necessary as a spraying system will be used.

All departments and facilities for making major repairs to rolling stock and for overhauling and painting this equipment will be installed in this shop. The stores building will receive and disburse supplies and material for all departments of the company.

Although the company does not plan to build cars, it will be in a position to handle its own heavy repairs and reconstruction. One department of the shop will be fitted to take care of body repairs for the motor coach division.

Since the Cincinnati Street Railway Company resumed the operation of its property Nov. 1, 1925, it has been using a section of the Cincinnati Car Company shops for major repair work.

A. K. Brumbaugh Joins White

A. K. Brumbaugh, formerly in charge of the experimental and test engineering departments of the Autocar Company, has joined the commercial engineering department of the White Motor Company. He is associated with G. W. Smith, Jr., technical assistant to Thomas H. White, vice-president and general manager, and will have charge of the division whose function is the establishment and maintenance of White standards. Previous to twelve years service with the Autocar Company, Mr. Brumbaugh was superintendent of transportation for the Consolidated Gas & Electric Company of Baltimore, engineer for the Maryland Casualty Company, with the railway engineering division of the Westinghouse company and the electrical department of the Baltimore & Ohio Railroad. He was graduated from Lehigh University in 1909 as an electrical engineer.

Sales of Mack Buses to Public Utilities High

Sales of Mack buses to electric railways and steam railroads during the first quarter of 1927 were higher than for any like period since buses became an important factor in transportation. During the first quarter this year, 82 per cent of bus sales were to public utility companies. Thirty-two per cent of buses sold were gas-electric drive and 30 per cent were the new Mack six-cylinder type. Bus sales in March to utility companies amounted to 73 per cent of the month's total business. Among the sales reported were the following:

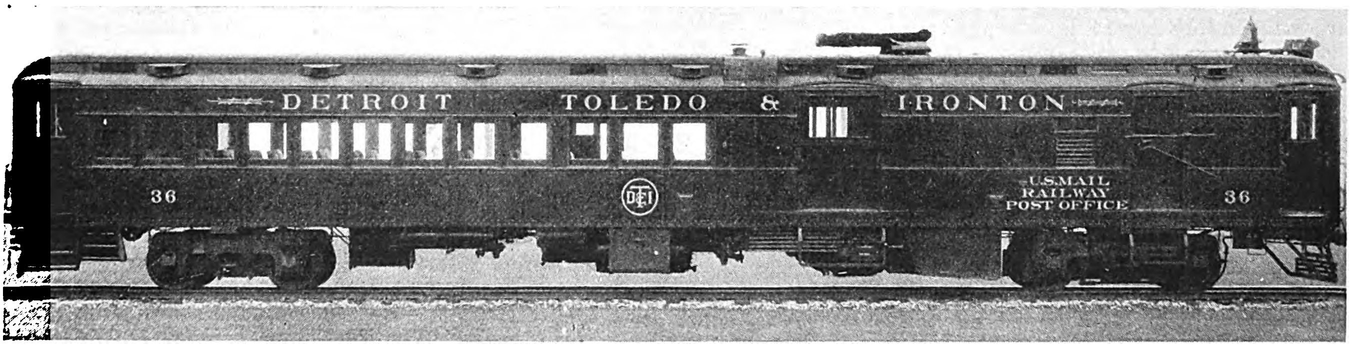
Oklahoma Union Railway, Tulsa, Okla., six 25-passenger city type buses, four-cylinder;
Lehigh Traction Company, Bloomsburg, Pa., one 25-passenger city type bus, four-cylinder;
New York, Westchester & Boston Railway, New York, 25 29-passenger city type Macks, four-cylinder;
East St. Louis & Suburban Railway, East St. Louis, Ill., one 29-passenger city type, four-cylinder;
New York, New Haven & Hartford Railroad, Boston, Mass., twelve 230-in. wheelbase Mack bus chassis, four-cylinder;
Twin City Rapid Transit Company, St. Paul, Minn., seven 230-in. wheelbase Mack bus chassis, four-cylinder;
Iowa Southern Utilities Company, Des Moines, Iowa, four 25-passenger city type buses, four-cylinder.

Report of a sale of twelve city type Macks, ten 25-passenger and two 29-passenger, to the United Railways & Electric Company, Baltimore, Md., in January was also received in March.

Officials of the International Motor Company's bus department in close contact with the situation in the electric railway field are optimistic concerning the outlook for the balance of the year.

New Cars for Henry Ford's Road

The gasoline-electric cars recently placed in service by the Detroit, Toledo & Ironton Railroad were built by the Pullman Company, which co-operated with the Hall-Scott Motor Company and Westinghouse Electric & Manufacturing Company. The cars are of all steel aluminum construction, 72 ft. 6 in. over all, 14 ft. high and 10 ft. 4 in. wide. Each car weighs approximately 66 tons.



Henry Ford is using gas-electric cars on his D., T. & I. line

R. L. McLellan in New Westinghouse Post

Ross L. McLellan, formerly managing director of the Compañia Westinghouse Electric Internacional, S. A., has been appointed general manager of the Westinghouse International Company with headquarters in New York. He was graduated from Purdue University with a degree in electrical engineering in 1907 and joined the Westinghouse forces in 1915 in Chicago as a salesman in the railway field. In 1920 Mr. McLellan became a member of the staff of F. H. Shepard, director of heavy traction, and in 1921 went to Santiago, Chile, where he contracted on behalf of the Westinghouse company for the electrification of the Chilean State Railways. In 1922 he represented the company in important negotiations with the government-owned railways of Brazil, and in 1923 was sent to Europe, also in connection with railway electrification. In 1924 he was made managing director of the Compañia Westinghouse Electric Internacional, S. A. Mr. McLellan is president of the Chamber of Commerce of the United States in Argentina and a member of the A.I.E.E.

Copper Dips Below 13 Cents—Lead Prices Cut

Dullness continues to be the outstanding characteristic of the non-ferrous metals in the domestic market. In spite of this prices have remained comparatively firm. This applies to each of the metals except lead, in which business has been done in moderate volume, apparently stimulated by lower prices. In general buyers are confident that their current needs can be met without difficulty and that there is no occasion for buying ahead. Though the principal copper producers have held firmly at 13 cents, some sales have been made at concessions all week, and the market cannot be quoted at the even 13 cents delivery in the East. On May 4 lead in New York was obtainable at a slight concession under the Smelting company's price of 6.75 cents, the prevailing quotation in the St. Louis market being 6.40 cents. Zinc has been fairly steady at 6.125 cents, or a trifle under, all week. Tin has been quiet, with prices fluctuating within narrow limits.

With one or two exceptions the past week has seen the dullest copper market in two or three years. Producers generally are in a fairly comfortable position, and they are apparently confident that the April statistics will show a marked reduction both in mine production and in stocks of refined metal.

Except for a few sales of moderate tonnage by first-hands and one or two by second-hands, the business of the week was placed at 13 cents in Connecticut and 13.125 cents at Middle West points. The bargain prices are reflected

METAL, COAL AND MATERIAL PRICES F. O. B. REFINING

Metals—New York	May 3, 1927
Copper, electrolytic, cents per lb.	12.750
Copper wire, cents per lb.	15.125
Lead, cents per lb.	6.73
Zinc, cents per lb.	6.46
Tin, Straits, cents per lb.	66 875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	2.25
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings, Kansas City, net tons	2.50
† Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.63

in the quotations only because of the extremely light sales by the producers who maintained the 13-cent price. Foreign business has been fair, the export price being 13.35 cents, c.i.f. all week. Some f.a.s. orders were placed at 13.05 cents and 13.10 cents.

On April 28 the American Smelting & Refining Company reduced its New York contract price from 7 to 6.85 cents, and on Monday, May 2, a further reduction to 6.75 cents was announced. The London market has shown a little more strength than in the past, spot lead in that market declining only 2s. 6d. following each decline in New York.

Corroding grades of lead command the usual premium of $2 to $3 per ton.

Statistics of production and consumption for April are not expected to bull the market.

Prime Western zinc has been sold in limited quantities during the week at prices ranging from 6.10 cents to 6.15 cents, East St. Louis. Zinc ore in the Joplin market has declined to $40 per ton, at which price current sales are around 12,000 tons per week against a production only slightly under 15,000 tons. The Far Western zinc districts are contributing increasing amounts to domestic production, so that Joplin does not dominate the situation as decisively as it once did. High-grade is quiet, with 8 cents asked for delivered metal in the New York district.

Tin Holds Fairly Well

There has been a moderate business on some days in tin for early delivery. Demand for futures has not amounted to much, though the more distant deliveries have been obtainable for from 1¾ to 2¾ cents less than prompt.

Nugey Process Sold to Swan & Finch

The soapless lubricating grease process developed by A. L. Nugey has been taken over exclusively by the Swan & Finch Oil Company, New York City, with plants at Elizabeth, N. J.; Buffalo, N. Y., and Chicago, Ill. In addition to these plants, branches are located in Syracuse, Boston, Pittsburgh and Detroit. Mr. Nugey is a mechanical and petroleum engineer, well known as the author of the volume "Oil Refinery Specifications."

New Bailey Meter Company Formed

Babcock & Wilcox Company and General Electric Company announce the formation on April 1 of a new company to be known as the Bailey Meter Company, which acquired the flow meter business of the General Electric Company and the fluid meter and combustion control business of the old Bailey Meter Company. Payment for the flow meter business and patent will be made to the General Electric Company in stock of the new company, of which the other principal holder will be the Babcock & Wilcox Company.

E. G. Bailey, president of the present Bailey Meter Company, will be president of the new company. R. S. Coffin, vice-president of the present company, will be vice-president in charge of administration and finances. R. E. Wooley, now connected with the General Electric Company, will be vice-president in charge of engineering and sales.

Messrs. Morrow and Cutter Added to International G.E. Board

Dwight W. Morrow, of J. P. Morgan & Company, and Victor M. Cutter, president of the United Fruit Company, were elected directors of the International General Electric Company on April 29.

Gerard Swope, president of the General Electric Company, was elected chairman of the board, succeeding the late Anson W. Burchard; Clark H. Minor was re-elected president; Walter J. Edmonds, comptroller, was elected a new vice-president in charge of financial relations, and E. F. Colyer was named comptroller.

Track and Line

Milwaukee Northern Railway, Cedarburg, Wis., has announced that it will separate its tracks from grade for 13,800 ft. between Fiebrantz Avenue and the Silver Spring Road crossing in Milwaukee. The tracks will be depressed under Olive Street, the proposed Roosevelt Drive, Silver Spring Road and the extension of 27th Street and are to be elevated over Hampton Road and across the lowlands adjacent to Mud Creek. According to R. H. Pinkley, vice-president, the work is being done to avoid the congestion of surface operation and the hazard on busy crossings in this rapidly growing residence section. The work will cost $270,000.

Municipal Street Railway, Seattle, Wash., is meeting with opposition in its proposed plan to tear up the single track on Fourteenth Avenue Northwest and to double track the line on Fifteenth Avenue Northwest from Fifteenth Avenue bridge to 67th Street and construct a single track from that point to the city limits. The chief opponents of the change are merchants on Fourteenth Avenue Northwest. Property owners in the district involved have been invited to bring their street railway problems to the City Council at an early date. The proposed work will cost $42,000.

Shops and Buildings

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is remodeling one of its oldest carhouses at National and 22d Avenues, at a cost of about $50,000. A new front and a new roof, pits and tracks will be installed. In addition new tracks will be laid on National Avenue between 22d and 24th Avenues.

Worcester Consolidated Street Railway, Worcester, Mass., has awarded a contract to the Henry R. Kent Company, Rutherford, N. J., for the construction of a one-story brick and concrete carhouse on Grove Street, Worcester.

Trade Notes

Consolidated Car-Heating Company, Albany, N. Y., has announced that its electric car heaters have been installed on some of the buses in New York City. They are plugged into the city lighting circuit at stop-over points to keep the interior warm, when the motor, which supplies heat from the exhaust on runs, is idle. Another innovation is the use of immersion-type heating units in the water-jackets and crankcases of the engines, to keep the water and oil heated when the motor is not running, thereby facilitating starting. These units are also furnished with current from the city circuit.

Lincoln Electric Company, Cleveland, Ohio, announces the appointment of Royal D. Malm as western district sales manager, with headquarters at Chicago. Mr. Malm is an engineering graduate from Case School of Applied Science, Cleveland, Ohio, class of 1912. For four years after leaving school he was engaged in construction engineering and then became identified with the Elyria Iron & Steel Company. Later he went with the Standard Welding Division of the Standard Parts Corporation as general superintendent. For the past year he has had charge of Lincoln sales in the automotive industries with office in Detroit.

International Register Company, Chicago, Ill., has received an order for electrically operated double registers to equip all of the cars of the Shreveport Railways, Shreveport, La.

Prest-O-Lite Company, New York City, announces the sale of the storage battery branch of its business to a new company, Prest-O-Lite Storage Battery Corporation. The entire capital stock of the purchasing company is owned by the Automotive Battery Corporation of New York. That portion of the Indianapolis plant of the Prest-O-Lite Company, Inc., used for the manufacture of storage batteries has been leased to the new company. The Prest-O-Lite Company, Inc., will continue the manufacture and sale of acetylene gas for use in the oxyacetylene process of welding and cutting metals. The company will continue operation of that portion of its Indianapolis plant devoted to the manufacture of gas cylinders, acetylene generators and other apparatus.

New Advertising Literature

Fitzjohn Manufacturing Company, Muskegon, Mich., is issuing a new catalog descriptive of its motor coach bodies especially designed for Studebaker dealers.

Interflash Signal Corporation, New York City, is distributing to state, county, and municipal officials throughout the nation a handsome circular describing its signals. Colored diagrammatic sketches with explanatory text matter present the various traffic situations where the signals are useful.

Alpha Electric Company, Inc., New York City, has just distributed a new folder presenting the uses of its "Van Dorn" electric drills.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 14, 1927 *Number* 20

Fire Protection of Bus Garages Demands Serious Attention

REGULATIONS for the construction and operation of bus garages have been under consideration for some time by the National Fire Protection Association. A committee of this organization has made a study and recently presented a progress report, which in substance is the third draft of a set of regulations. Since electric railways have become large operators of buses the subject has become of increased importance to the industry, and the American Electric Railway Association has been given representation on the committee.

G. C. Hecker, the association's representative, in the May issue of *Aera* indicated that the tentative regulations do not meet with the full approval of many bus operators, and that there is a wide difference of opinion as to the methods of protection against fire that should be adopted. He felt it is desirable to get as comprehensive a discussion as possible.

In this issue of ELECTRIC RAILWAY JOURNAL is a communication by Howard H. George, chairman of the committee on ways and structures of the Engineering Association, under which comes the subject of garages. Mr. George mentions some of the objectionable clauses in these specifications. For instance, great stress is laid on so designing the garage that buses can be run out quickly in the event of a fire. With the explosive gasoline that is always present in large quantity, it is questionable whether in any garage fire it will be possible to start the engines and move out any considerable number of buses before the fire gains such headway that it is dangerous to life to attempt to move the vehicles. Then, too, many such fires occur at night and in cold weather. With the engines cold considerable time will be needed to run out even one bus, and with the small number of men who are available at night, when practically all are off duty, there is little chance that property can be saved in this manner.

Another instance of a clause that does not meet with the approval of operators is that which limits the height of any story for a garage to 20 ft. for single-deck buses and 25 ft. for double-deck buses. It is not evident that there is any need for this distinction, and still less likelihood that any operator of both types of buses will be able to restrict entire floors to one or the other. Similar questions apply to several other sections of the report, particularly those on type of fireproof construction for roofing, area of windows with respect to floor space, and methods of ventilation.

It is only by careful analysis of the report that the specifications can be written so as to be of the greatest good to the greatest number. Mr. George in his comment does not advocate practices which would increase the fire risk, but on the contrary he feels that certain modifications would result in a decrease in risk, while at the same time the ease of operation would be enhanced. Every bus operator and every garage designer should lend his assistance by making such suggestions as he considers will be constructive. In that manner only will it be possible to secure minimum fire risk with greatest facility in movement and ease of operation.

Electric Railway Business Flourishing in Canada

HIGHLY encouraging to the whole electric railway industry are the reports recently submitted by member companies to the president of the Canadian Electric Railway Association. From the Maritime Provinces on the east to British Columbia on the west railways record more passengers and greater revenue in 1926 than they had in 1925. In the entire Dominion only two railways report a decrease in business. Summaries of the statements of operating officials in practically all the important cities in Canada are given in an article elsewhere in this issue.

Reasons are numerous for the flourishing condition of the Canadian electric railways. The territory served by these systems has increased rapidly in population since the war. This is particularly true of the Western Provinces. In the east general business conditions have been good, especially that of the paper pulp mills. While the use of private automobiles has grown considerably, the increase has been less marked than in the United States. The comparative scarcity of well-paved roads has acted as a check on automobile popularity. So, also, have the severe winter weather conditions habitually encountered in many parts of the dominion.

Factors which have tended to discourage the use of the private automobile have hampered bus development, too. This has been both a drawback and an advantage. Despite conditions somewhat unfavorable to motor vehicle operation, extensive bus systems have been developed by the railways in Toronto, Montreal, Winnipeg and Vancouver. Others have gone into the bus business on a smaller scale. A number of railways are planning to expand their bus service in the near future.

From the viewpoint of limiting bus competition the difficult conditions have been fortunate, because the Canadians look more favorably upon competition in transportation than do the majority of people in the United States today. Duplication of service is permitted in many localities. The future of several small interurban railways is seriously threatened. That this situation should exist is surprising, because many of the Canadian railways are municipally owned. For the most part, however, the rail systems are furnishing a service for which no acceptable substitute has been found, and it is the general belief that they will continue to play the primary rôle in local transportation.

Plans are being made to extend and improve the service. Figures for passengers carried and revenue received during the first few months of 1927 show a continuation of the upward trend in evidence last year. Except in two or three of the smaller towns, prospects for the future are thought by the managements to be extremely bright.

A Determined Effort for Practical Patriotism

IT WAS indeed gratifying to an observer at the recent meeting of the United States Chamber of Commerce to hear repeated opposition to government control and interference with business. Likewise it is gratifying to note the stand taken by that body on the subject of federal, state and local taxation. The average American citizen has been busy so long making money that he has failed to grasp the seriousness of the situation in the city by the Potomac. The gradual aggression of federal government upon those inalienable rights guaranteed to the citizens is making the Constitution a scrap of paper. The repeated efforts by the government to operate business enterprises have resulted in a laughable exhibition of inefficiency and mismanagement. No matter how practical may be politicians, they are theorists when it comes to transacting business for a legitimate profit or for the good of the majority. For any arguments to the contrary, we offer the powerful rebuttal as revealed in the government's handling of the railorads; or, again, the building of cantonments during the war. Like the Alamo, they should be remembered.

There is a narrow, almost indefinable line between autocracy and democracy. In the history of the world the rise of any one person or party to power has been preceded by the overthrow of economic balance. The patriotism of a democracy then demands that business be divorced from the sphere of government. The safety of a republic lies in the right of every citizen for individual expression. Mathematically, a government is the sum of its citizens. No theoretical political structure has ever or will ever take raw material and convert it into useful and necessary products.

It is, therefore, a gratifying sight to see a body representing a cross-section of our citizenry demanding the right to conduct the nation's business along the lines of sanity, economics and individual liberty. For years we have put too much confidence in our new-hatched, unfledged spellbinders that yearly congregate under the dome on Capitol Hill. The chamber's action is a determined effort at practical patriotism.

A Human Engineer Proves His Case

MANY speeches made today may be described as wind pudding with rainwater sauce. The speaker with a real message is a *rara avis.* When one is encountered we always find a personality fired with the spirit of service and conviction; a personality thrice armed because its quarrel is just. Such a personality is found in Arthur T. Morey, whose speech on industrial relations before the recent meeting of the Chamber of Commerce of the United States is abstracted elsewhere in this issue.

A lawyer by education, general manager of the Commonwealth Steel Company by occupation, and a human engineer by conviction, Mr. Morey has found his greatest reward in the latter capacity by assisting a worker to find himself. Those who were privileged to hear his address came away with the feeling that he has brought practical Christianity into business. After Mr. Morey had outlined the work of his company in promoting a new era of industrial relations, one was convinced that he has proved that sentiment, citizenship, the aspirations and individualism of the work will loom large upon the horizon of greater business in the future.

Perhaps the most significant thing about the campaign of Mr. Morey and his associates lies in the fact that they have placed the development of the individual above what it cost to develop him. With the fetish of the almighty dollar eliminated, the program has gone forward with marked success, and, as usual, in the forgetting of self, the directors of the Commonwealth Steel Company, in the end, have reaped financial benefits.

In this particular it was a source of some amusement and keen gratification to an observer for the JOURNAL to hear the remarks of two industrialists who sat near him: "Aw, you can carry that thing too far," commented the gentleman who typified the age of "catch 'em young and treat 'em rough." His companion agreed with him, and the conversation was centered upon the question of how much it would cost. As if reading the minds of the two gentlemen, Chairman Brosseau arose when the speaker had finished and informed the gathering that he had asked Mr. Morey what was the financial result of the program, and Mr. Morey had replied, "Higher production and lower unit cost." In other words, the scoffers had been confounded, and a human engineer had proved his case.

What a Difference the White Caps Made!

VISITING a relative in another city where a new trolley manager had been functioning only a few weeks, a railway executive could not help casting a professional eye on the local scene. What impressed him most was the apparently insignificant fact that the trainmen were wearing white yachting caps! Indeed, he hardly had a chance to notice and approve this novelty before his relative and various townsmen began to brag about the sartorial initiative of the new manager. The white caps had no necessary connection with anticipated improvements in equipment and service, but were symbolic of better things to come.

Here is an example worth pondering. The new man wanted to create a favorable impression as quickly as possible. Rerouting, new schedules and new rolling stock would be a matter of months and put a strain on the public's expectancy, but the innovation of white yachting caps for summer wear could be put through almost overnight. The way the citizens greeted this change was beyond all hope.

It is a mistake to suppose that the people appreciate only big and splashy effects in public relations. The manager who bathtub-enameled his old cars pending receipt of new ones and the operator who first set out sidewalk benches to soften the annoyance of waiting for a car also spent relatively trifling amounts to strikingly good purpose. It is true that all three of these executives possessed the Heaven-sent gift of imagination, but with such and many other examples of like nature in the records of our technical societies and journals there is no reason why even the most unimaginative cannot pick some of them for his own use. Imitation of such examples is not only the sincerest flattery, but also good business for everybody concerned.

An Ohio Interurban Being Put Back on the Map

RESULTS achieved since the reorganization of the Cincinnati, Hamilton & Dayton Traction Company more than a year ago are fully up to expectations. It is true that the reorganization was a drastic one, but that is not the answer to the accomplishments. Other reorganizations have been quite as drastic. The story of success of the new management lies more in its militancy than in anything else. It is convinced that this 86-mile road can be put back on the transportation map, and the digest of the report of earnings published in the JOURNAL for May 7 makes it appear that its ardour for the task is ample.

The story has been so presented that he who runs may read. The need now is to emphasize only certain points. One of these is the part that new cars have played in the program of rehabilitation. Another is the realization of the value of freight as a revenue producer and the extent to which the management is prepared to go to cater to this business. Still another is the development of a public relations policy that contemplates the use of daily newspaper advertising and the publication of a house organ to keep the riders and others informed and interested.

There is nothing new in any of these things. They are all instruments to the end, panaceas only when properly used. And they have been properly used in the past by the very management that is now in charge of this property. That is what invests the recital of this story with value. Much more important than the sum would seem to imply is the figure of the final balance of $43,928 for the operation of the property from March 9, 1926, the date the reorganization became effective, to Dec. 31, 1926. Even sums of money are relative. Sizable sums are not to be judged entirely by the number of the digits they contain. Certainly any pride that may be felt by the management of the Cincinnati, Hamilton & Dayton Corporation on its accomplishments of the past year is pardonable.

One Out of Three Gets Across

JAY-WALKING will be discouraged in Chicago by the imposition of suitable penalties on the offenders, if the recommendations in a report recently made by the Albert Russel Erskine Bureau for Traffic Research are followed. Any pedestrian who crosses other than at a street intersection when the signal is given will be considered a jay-walker. Such a person not only endangers his own life but also creates a serious obstruction to vehicular traffic.

One often wonders just what the jay-walker intends to do with the few seconds he tries so hard to save. As a matter of fact, the investigation demonstrated that time seldom is gained by this kind of infraction of traffic rules. Checks made at typical intersections showed that more than half of the pedestrians held up by movement of cross traffic try to break through the stream against the signal lights, but that only one-third of those who make the attempt are successful. The rest are caught in a huddled mass in the center of the roadway between ines of moving vehicles.

The occasional success of the jay-walker who breaks hrough is more than offset by the continuous reduction n street capacity caused by pedestrians edging out into he roadway. Miller McClintock, director of the Erskine Bureau, states that studies made in the Chicago Loop district reveal a reduction in capacity from two lanes of traffic moving at 15 m.p.h. to one lane moving at 10 m.p.h.

Heretofore, objection to jay-walking has been based on the idea of preventing accidents, but the survey shows that the matter has another aspect of equally great importance. If the motive of safety has not been enough to discourage jay-walking, the evidence that little time is gained may be more convincing. For the remaining unbelievers, the penalties recommended may drive the lesson home.

Municipalization Recommended at Los Angeles

UNLESS things are not what they seem Dr. Delos F. Wilcox favors municipalization of the lines of the Pacific Electric Railway Corporation, Los Angeles, Cal. He thinks that the purchase price would be less than $30,000,000. He deems the purchase advisable on the ground that, among other things, the city would be freed from the jurisdiction of the Railroad Commission; that the cost of new capital would be limited to the rates paid on city bonds instead of the rate of return allowed by the Railroad Commission on private investments; that gross receipt and income taxes would no longer have to be paid. These are merely some of the things he cites in favor of the plan he advocates.

His is, of course, a counsel of affirmation, but even he, as a proponent of the measure, tacitly if not outwardly warned the city that Mr. Huntington, owner of the system, would insist on the fulfillment of certain stipulations intended to protect him against the uncertainties of the municipal ownership policies. Dr. Wilcox himself says that the good features of the present management ought by all means to be preserved in case the city should decide to take over the railway. This is, indeed, a timely warning.

The Los Angeles *Times* characterizes the Wilcox report as "vague in its conclusions and recommending no definite plan." It is true no definite plan is outlined, but that was hardly to be expected in a preliminary report. The author's warning about preserving the good features of the present management was made without reservation, and however imperfect the conclusions of the expert may be, he did not stub his toe over this factor. Dr. Wilcox may not see the same as others with respect to all the virtues of private operation and ownership, but his long service in consulting work and his contact with politics in his various studies of public life have impressed him with the need of caution in a direction in which caution is seldom exercised.

It is said that advice is given in bushels and taken in grains, but the very warning of the city's expert confirms the significance of the statements made by Managing Director Storrs with respect to the results with municipalization of its railways by the cities of Detroit, Seattle and San Francisco. As Mr. Storrs said at New Orleans, these three outstanding examples of what municipal ownership of electric railways means in the United States should be enough to warn any municipality against it. Los Angeles is still apparently a long way from municipal ownership. If the danger signal means anything, it should stop, look and listen a long while. And if it does that, it may save itself from itself.

Plaza in front of Union Station, Ottawa. Last year the Ottawa Electric Railway carried 1,500,000 more passengers than in 1925

Railway Revenue Increasing

Survey of conditions on 25 important electric railway properties in Canada shows marked improvement over those prevailing a year ago. Bus operation developing slowly

SUBSTANTIAL increase in gross revenue during the past year is reported by nearly every electric railway replying to inquiries made by W. R. Robertson, president Canadian Electric Railway Association. Included in this survey are twenty-five important railways in the provinces of Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. In all, these companies own more than 1,600 miles of track and operate approximately 3,500 cars.

Inquiry was made at the same time concerning the bus situation in the territory served by each of these railways. Answers indicate that development is proceeding slowly. Besides the thirteen Canadian railways operating buses at the first of the present year, however, a number of other companies have under consideration plans to establish bus service in the near future.

Receipts of the Nova Scotia Tramways & Power Company, Halifax, were 5.66 per cent greater in 1926 than in 1925, according to W. H. Munro, manager. He expressed confidence in the future of the industry and plans to spend money on new cars and track improvement year by year. Although this railway is not paying dividends at present it is gradually improving its earnings. It is hoped eventually to make it a profitable undertaking and indications are that this will be done in the near future if the general business activity of the district keeps on improving.

Another railway in eastern Canada, the New Brunswick Power Company, at St. John, reports that gross revenue for 1926 increased about $77,000 over the preceding year and revenue passengers about 140,000 in the same period. Mileage operated in 1926 was approximately the same as in 1925, namely, 1,200,000 car-miles.

According to M. A. Pooler, general manager, the increase in revenue occurred principally in the early months of 1926 and in December of that year. St. John is a city of walking distances and it is only with extremely bad conditions under foot that there is any large increase in railway traffic. This has been especially noticeable during the early months of 1927. The winter has been open and revenues have shown a downward trend. Favorable weather conditions have enabled automobiles to operate more easily and a greater number of licenses have been isued by the Department of Public Works thus far this year than for some time past. As a rule the majority of passenger car owners do not use their cars to a great extent until the early spring.

In view of these circumstances it is difficult, Mr. Pooler says, to make any prediction as to the outlook for the entire year of 1927. The railway's prosperity is dependent upon the prosperity of the community. If business improves the management hopes that it will be reflected in revenue. If the recommendations now before Parliament regarding the Maritimes are put through by the government it is expected that conditions will improve to a marked extent.

PROSPECTS BRIGHT IN THE PROVINCE OF QUEBEC

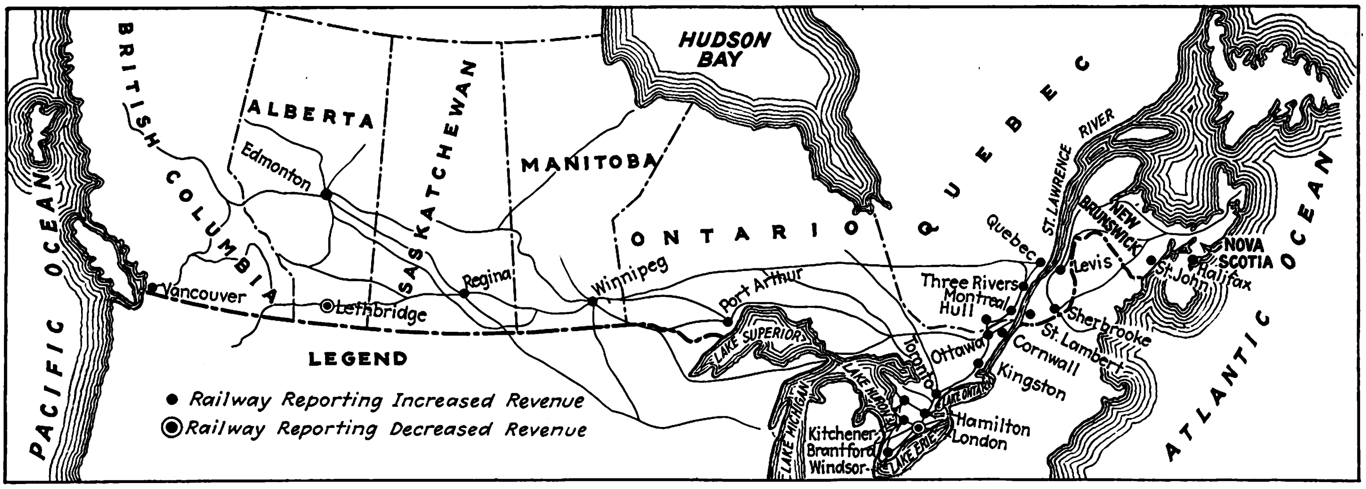
All signs point to much better conditions in and around Quebec than at any time since the close of the World War, in the opinion of J. E. Tanguay, general manager Quebec Railway, Light, Heat & Power Company. The past year has seen definite progress toward business improvement. Industrial activity has increased in many lines, with consequent increased employment in the building trades and greater spending power.

During 1926 the revenue of the railway increased 5 per cent over that for 1925, with a corresponding increase in the number of passengers carried. The early part of 1927 shows no change in this trend and the indications are that it will be a banner year. Prospects are good for heavy tourist traffic to Quebec during the coming summer. This is expected to result in increased patronage on the local railway lines as well as on the interurban line to St. Anne de Beaupré. It is hoped that new records may be made this summer in the number of passengers carried.

Across the St. Lawrence River, H. E. Weyman, manager Levis Tramways, says that electric railway conditions improved last year and the outlook appears favorable for the future, because there is much more activity generally in the Quebec and Levis districts than there has been since 1920. The earning power of the people has improved and electric railways are feeling this improvement. On the other hand, the private automobile competition was felt more last year than ever before. In spite of this the Levis Tramways was able to increase its revenue by publicity, maintenance of friendly relations with the public and a campaign to sell transportation.

Down near the American border the Sherbrooke Railway & Power Company states that for the year ended February, 1927, its gross earnings showed an increase of 10 per cent over the gross earnings for the year ended February, 1926. At Three Rivers the traction company has had a good year and the revenue has shown a marked increase. That district has been prosperous, due principally to the newsprint situation and the extensive construction program carried out by various paper mills. The population has been increasing steadily and indications are that 1927 will be another good year for the railway.

The outlook appears to be extremely favorable in the territory served by the Montreal & Southern Counties Railway, according to W. B. Powell, general manager. The number of passengers carried during the year 1926 was the largest of any year in the history of the company. So far this year traffic has shown an increase over the figures for the same period last year. In 1926 the operating ratio was 80.9 per cent, as against 81.8 per cent in 1925. General business in this territory is active and the population is increasing. Future prospects for the railways are encouraging.



From the Maritime Provinces on the east to British Columbia on the west Canadian electric railways report increased earnings

During the twelve months ended Dec. 31, 1926, gross passenger revenue of the Montreal Tramways increased 2.92 per cent over the same period of the previous year. For January, 1927, the increase was 3.86 per cent, for February 3.70 per cent and for March 3.67 per cent. The average from Jan. 1 to March 31, 1927, was 3.75 per cent over the same period of the previous year.

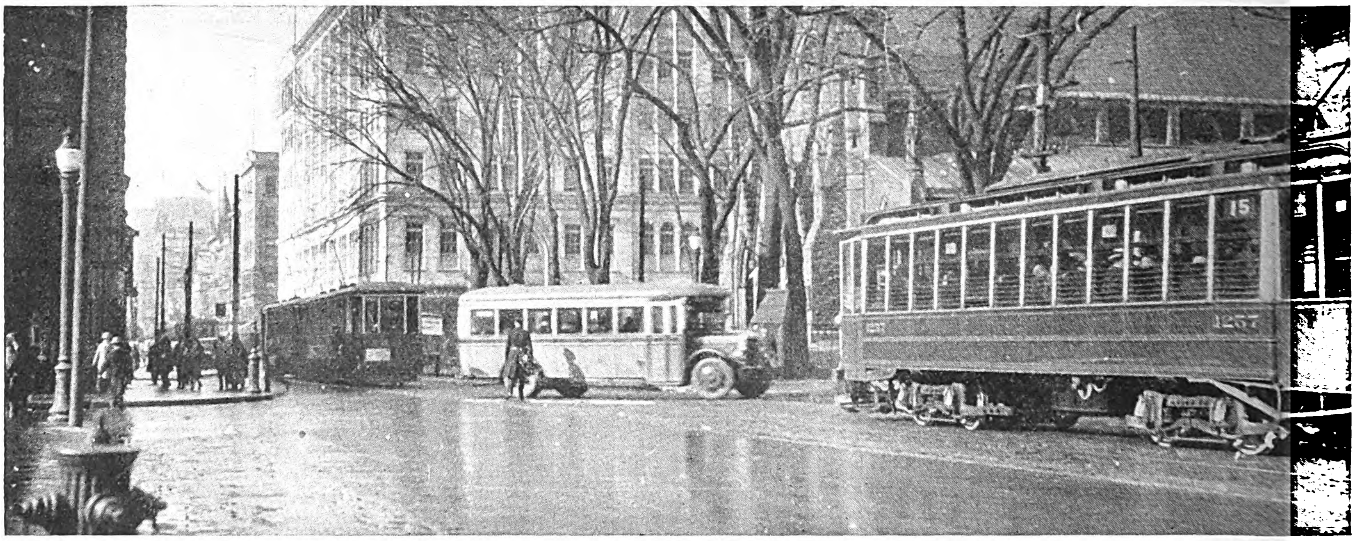
With regard to bus earnings, it is difficult to make comparisons, according to J. E. Hutcheson, vice-president and general manager. For the six-months period ended Dec. 31, 1925, the gross revenue per bus-mile was 24.63 cents, while for the year ended Dec. 31, 1926, it was 26.46 cents per mile, an increase of 1.83 cents, or 7.42 per cent. The number of buses in operation in 1925 was 26, and in 1927 it was 54. Earnings per revenue passenger in 1925 were 6.90 cents and last year 7.61 cents. Revenue bus-miles operated in 1925 were 287,694, in 1926 they were 1,543,632.

After the experience of two winters of operation it is the opinion of the management that the normal future expansion of the tramway system in outlying territory can be satisfactorily affected by motor buses. Use of motor buses co-ordinating with the tramways furnishes more economical expansion and aids the growth of the city without involving large expenditures for construction of new tram lines.

At Hull, across the Ottawa River from the capital of the Dominion, A. V. Gale, manager of the Hull Electric Company, reports a slight improvement in traffic conditions on the railway. This has been due in part, at least, to the failure of a bus line which had been competing with the railway. A moderate increase is expected in the company's business this year.

RAILWAY BUSINESS GOOD IN PROVINCE OF ONTARIO

The year 1926 showed an increase in passengers carried by the Ottawa Electric Railway amounting to nearly 1,500,000 over those carried in 1925. Thus far during the present year there has been an increase of about 5,000 passengers per day over last year. According to Major F. D. Burpee, vice-president and general manager, after the peak year of 1925 the company experienced a steady decline up to and including the month of February, 1926. Since that date railway traffic has shown a steady upward tendency. General business in Ottawa is good. Retail merchants seem prosperous and the future outlook is favorable. The growth of railway patronage, despite the increase in the number of automobile licenses issued, is most encouraging.



Despite weather conditions that hamper motor vehicle operation, the Montreal Tramways has developed an extensive system of co-ordinated car and bus service

In the small town of Cornwall the street railway reports an increase of $15,780 for 1926 over the 1925 revenue. According to W. L. MacFarlane, manager of the Cornwall Street Railway, Light & Power Company, the largest part of the revenue comes from the movement of freight. This was substantially larger in 1926 than the year before. Other traffic also has increased as shown in the following table:

COMPARATIVE STATEMENT OF EARNINGS

	1925	1926	Increase
Cash fares	$28,162	$31,484	$3,322
Ticket sales	8,888	13,992	5,104
Mail service	1,400	1,600	200
Freight and express	30,905	38,663	7,757
Other revenue	2,753	2,150	603*
Total operating revenue	$72,108	$87,889	$15,780

*Decrease.

For the week ended March 12, 1927, the total earnings were $2,630, as compared with $1,421 for the corresponding week in 1926, an increase of $1,209. Passengers carried numbered 26,070, as compared with 15,931 for the corresponding week a year ago. The figures for this period are considered to be typical of conditions this year.

The directors of the company feel optimistic over railway conditions in Cornwall. Last year a capital expenditure of $20,000 was authorized for various improvements, including the purchase of two additional passenger cars. This year an expenditure of $38,000 has been authorized for three more passenger cars and an addition to the carhouses.

Revenue of the Kingston, Portsmouth & Cataraqui Railway is not so large as it was in 1921, according to H. C. Nichol, general superintendent, but was larger in 1926 than the year before. Passenger revenue for the twelve months ended Dec. 31 last was $51,570, as compared with $51,293 for the preceding twelve months. In his opinion, the large number of privately owned automobiles in the city is responsible for passenger revenue being smaller than it was some years ago.

D. W. Harvey, general manager Toronto Transportation Commission, reports a substantial increase in traffic in the city lines during the past year, and indications are that 1927 will show an improvement over 1926. Operating economies have reduced expenses notwithstanding the increase in the volume of traffic handled. Because the management has had experience with the suburban lines for only a limited time it is difficult to forecast their future accurately. It is the feeling, however, that the position of the recently acquired 97 miles of radial lines will be improved as the result of linking and co-ordinating them with the city system.

At Windsor the railway has had a continued increase in revenue since it was taken over in 1920 by the Hydro-Electric Power Commission. In 1919 the gross revenue of the lines serving Windsor and the other border cities was $355,000. For the year 1926 the gross revenue was $1,031,443. This was an increase of 203.9 per cent compared with the first year of Hydro-Electric operation. During this period operating expenses increased only 177.1 per cent, resulting in a gain of 148 per cent in net revenue. The number of passengers carried has increased from 9,150,000 in 1920 to 18,410,000 in 1926. Revenue for the first four months of the present fiscal year, which began Nov. 1, shows an increase of more than $43,000 over the corresponding period the year before.

At Guelph the railway in 1926 had the largest revenue in its history. The Toronto & York Radial lines showed some decrease in revenue, due partly to the transfer of certain portions of the interurban lines to the jurisdiction of the Toronto Transportation Commission and partly to bus competition. It is expected that the bus competition will be eliminated in the near future.

City lines of the Brantford Municipal Railway in the year 1926 showed considerable improvement over 1925. Passengers carried numbered 2,543,176, as against 2,344,842 the preceding year, an increase of 198,334. Passenger revenue was $129,293, as compared with $119,904, an increase of $9,389. On the interurban lines to Paris there was a slight decrease. Passengers carried were only 104,495 in 1926, as against 109,696 the year before. The loss in revenue amounted to $319.

Increase in the city business is attributed by A. H. Foster, manager, to the fact that the industries in Brantford have been busy of late and there has been little unemployment. While this condition continues the railway may expect good business. The prospects for the interurban line are not particularly bright, in his opinion. Competing buses are to some extent responsible for this, but the widespread ownership of private automobiles is the fundamental difficulty.

At Hamilton the Dominion Power & Transmission Company shows a marked improvement in its street railway business. George E. Waller, manager of railways, is optimistic concerning the future of the city lines, but expresses doubt about interurban lines serving outlying communities.

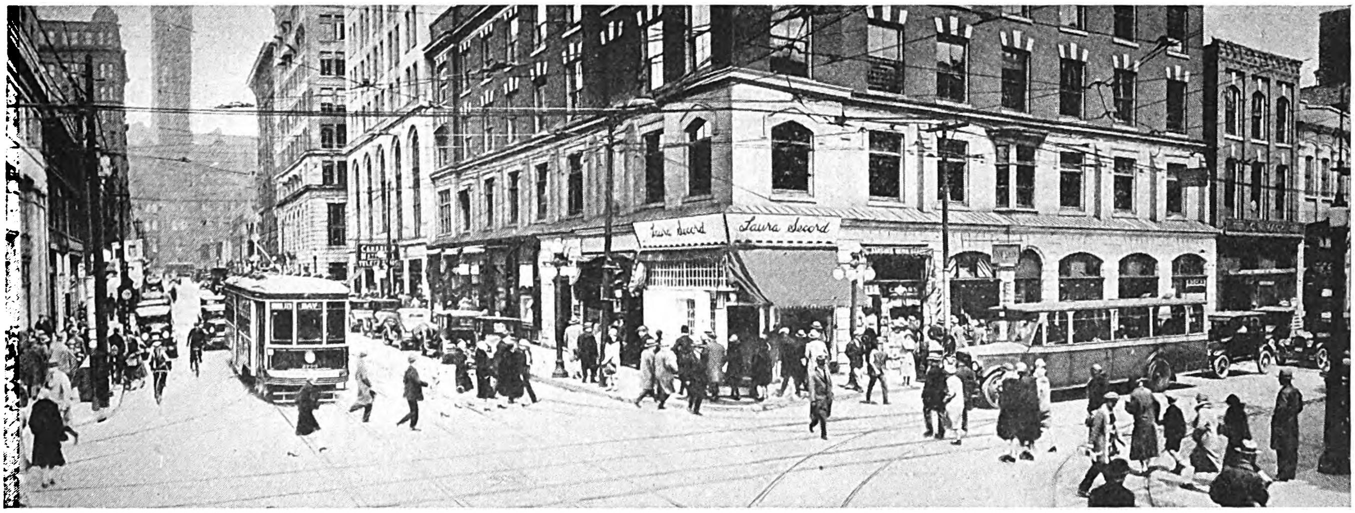
While there was an increase in railway traffic at Kitchener during 1926 over the previous year, the present outlook is not thought by V. S. McIntyre, manager, to be particularly favorable. To date during 1927 the traffic has been somewhat less than during the corresponding months of 1926.

Although the London Street Railway operated approximately 120,000 more car-miles and bus-miles during the year 1926 than during 1925 the revenue showed a decrease of about $2,000. The same general tendency has continued during the early months of 1927. In the opinion of Leonard Tait, manager, this is largely due to the open winter, the streets in the city of London having been free of snow practically all the time.

Last fall this company began the conversion of two-man cars into one-man, treadle-exit cars. Four cars have already been changed over and the fifth is now under way. It is expected that the reduction in operating expense will to some extent balance the decrease in revenue.

At the Head of the Lakes, electric railway conditions in Port Arthur have shown substantial improvement recently, according to T. W. Brackinreid, manager. Whereas the Port Arthur City Railway had a deficit of $1,160 in 1925, it had a surplus of $5,642 last year. For January and February, 1927, earnings were approximately $4,000 per month above the corresponding period of 1926. March, 1927, was about $3,000 above March, 1926. This increase in revenue is due partly to the heavy snowfall during the past winter, necessitating the storage of private automobiles. The major portion of the increase, however, is due to improvement in industrial conditions. Last summer the railway built an extension to serve the Thunder Bay Pulp Mill. This has been profitable from the day when operations began.

Success or failure of the street railway at the Head of the Lakes depends entirely upon industrial conditions, Mr. Brackinreid states. In past years revenue sometimes has increased due to the construction of grain elevators, but after the construction was completed the revenue dropped off again. With the growth of the pulp mill business, however, conditions have improved because practically the same number of men are employed in the operation of the mill as were employed during its construction.



Traffic on the lines of the Toronto Transportation Commission showed a substantial increase last year. At the same time operating expenses were reduced

ENCOURAGING CONDITIONS IN WESTERN PROVINCES

Since August, 1925, the railway department of the Winnipeg Electric Company has shown steady improvement in gross earnings and the number of passengers carried, according to A. W. McLimont, president. Last year showed an increase of 2,289,000 revenue passengers over those carried in 1925. This was a gain of approximately 5 per cent. Traffic has not yet got back to the peak year of 1925, but will soon reach this figure if the present improvement continues. Figures of passengers carried by years are given in the following table:

Year	Passengers Carried
1921	61,515,000
1922	60,399,000
1923	58,253,000
1924	55,978,000
1925	55,096,000
1926	57,985,000

Railway conditions at Regina, Sask., are very encouraging, according to D. W. Houston, superintendent. Since 1924 the revenue has been increasing steadily. Up to the end of last year it had not quite got back to the high level prior to 1924, but revenue for the first quarter of 1927 was the highest in the history of the railway. The city of Regina is growing and its growth is being reflected in increased street railway traffic.

At Lethbridge, Alberta, railway operation still presents a rather puzzling problem, according to M. Freeman, commissioner of public utilities. On account of the small population of the city and the short distances it is difficult to make street railway operation profitable. In 1926 revenue decreased 2 per cent as compared with the preceding year, but a reduction in operating expenses of 12½ per cent was made, so that the net revenue was substantially increased.

Electric railway conditions at Edmonton are good, according to W. J. Cunningham, superintendent street railway department. The number of privately owned automobiles has increased enormously during recent years, but in spite of this, and the fact that the population of the city has not greatly increased, the number of passengers carried annually remains nearly the same as it was in 1922, the maximum year, as shown below:

1917	10,086,213	1920	12,371,091	1924	12,365,889
1918	9,909,529	1921	12,790,738	1925	12,588,475
1919	11,779,466	1922	12,914,896	1926	12,388,636
		1923	12,339,465		

The year 1927 has started out well. For the first four months traffic was well ahead of last year with an increase of more than 300,000 passengers.

For twelve months ended Dec. 31, 1926, the British Columbia Electric Railway carried 61,311,703 city passengers and 6,706,509 interurban passengers. When compared with similar figures for the year ended Dec. 31, 1925, an increase of approximately 4.18 per cent is shown in city travel and 3.41 per cent in interurban.

W. G. Murrin, vice-president, reports that revenue in 1926 from city line operations increased 4.15 per cent over the previous year, while interurban operations showed a decrease of approximately 0.21 per cent.

Car-miles operated in 1925 and 1926 were respectively 11,257,177 and 11,845,149 on the city lines and 1,933,050 and 2,008,872 on the interurban lines. This was an increase of 5.22 per cent on the city lines and 3.92 per cent on the interurban.

Bus Development Proceeding Slowly

Operation of buses by electric railways in Canada has not progressed as rapidly as in the United States. This is due in large measure to adverse weather conditions. At St. John, N. B., the railway has not undertaken to render bus service. Careful study has been made of this question, but it is felt that it would be impossible to make money with buses under existing conditions.

The Three Rivers Traction Company is considering the establishment of a bus line and expects to have it in operation within a year. The Montreal & Southern Counties Railway and the Hull Electric Company are both considering the operation of buses. Elsewhere in the Province of Quebec no plans to extend bus operation are reported. Mr. Weyman of Levis says that there is a field for bus transportation to outlying districts during the summer time, but it is impossible to operate buses in this district from November to May. Under the circumstances it is impracticable to undertake the service. The territory served by the Sherbrooke Railway is considered too small to be a promising field for bus operation.

At Montreal there are two classes of bus service, "tram auxiliary bus service" and "convenient bus service." The former, in lieu of tram service, is operated on standard tram fare. On the convenient bus service the fare is 10 cents cash or three tickets for 25 cents. In the first instance the service is given at a loss, but is justified by the fact that the losses are less than on tram operation of the same service. The convenient bus service is given to offer more convenient, direct and comfortable transportation and has been well patronized.

Both the above-mentioned services were inaugurated to retain public good will, and it is thought that its establishment has done more than anything else to convince the public that motor buses will never replace trams for mass transportation. The prospects for the future, for all transportation services, are promising.

In Ontario the bus service of the Ottawa Electric Railway thus far has been conducted at a slight loss. Operations consist of one regular suburban route feeding the city railway, sightseeing routes operated during the months of May to September inclusive and chartered trips throughout the year. It is the belief of the management that the bus can render useful service when co-ordinated with the street railway. On account of the limited experience which the company has had with buses no definite conclusions concerning their future possibilities have yet been reached.

At Cornwall the railway has no intention of undertaking bus service. The distances that people ride in the city are comparatively short and much of the railway revenue is derived from the transportation of factory employees. For this kind of patronage the street cars, with their larger capacity, are thought to meet the requirements better than buses.

The Toronto Transportation Commission now operates a fleet of 80 buses and coaches. Service was first established in 1921, principally to feed the street railway. Six feeder routes are now in operation and two more will be established in the near future. The feeder bus routes serve districts that could otherwise be served by street cars, but where the traffic is so light that the car service would not pay. Losses with bus operation are less than they would be if cars were operated.

In June, 1925, the commission began the operation of motor coaches painted a distinctive color and operated independently of the railway. A special fare is charged. These vehicles are used on interurban routes, for chartered trips, in sightseeing service, on school contracts and for other similar purposes. The gross revenue in 1925 was $132,000; in 1926 it was $300,000, and it is expected that in 1927 it will be well over $500,000. This represents business which could not have been obtained by railway operation and is an important addition to revenue.

At Kitchener the Public Utilities Commission feels that certain sections of the city may deserve better transportation facilities, but that bus service would not pay in those districts. For that reason no plans have been made to establish it. Similarly at Port Arthur bus operation is not favored by the Public Utilities Commission except for long-distance runs to such places as Duluth or other remote points.

Conditions for bus operation at Winnipeg are quite different from those prevailing in the eastern part of Canada. Population is less dense and there are comparatively few outlying towns of any size. Moreover, highway construction has not yet reached the same stage of development as in the East. The management of the Winnipeg Electric Company therefore believes that the field for bus operation there is comparatively small and the company has not gone into interurban bus operation to any large extent. One route is in operation from Winnipeg to Transcona, a round-trip distance of 15 miles. Some extension of this type of service is contemplated for the near future. Buses have been used in local service as feeders to the street railway since April, 1918. Eight such routes are now in operation and it is planned to add to their number in the near future.

Real demand exists today in the territory served by the British Columbia Electric Company for de luxe bus service, particularly for intercity service of this type. It is thought that undeveloped city and suburban districts constitute a good field for experiment with feeder buses connecting existing lines, but the experience of this company indicates that this kind of service is unremunerative on account of the low fares charged. Success or failure of such feeder buses, according to Mr. Murrin, depends entirely upon the density of travel and the rate of fare. This company was one of the pioneers in bus operation and plans to extend this service in the future.

Portage Avenue, Winnipeg, Manitoba. Railway traffic in this city has shown a steady increase since August, 1925

First Aid School Has 335 Graduates

GREATER public safety and a better knowledge of "what to do until the doctor arrives" are purposes of the First Aid training school conducted by the Chicago Rapid Transit Company under the direction of Dr. Hart E. Fisher, head of the medical department, and which graduated nearly 300 student-employees during 1926. The Chicago, North Shore & Milwaukee Railroad simultaneously graduated 35 employee-students. Regularly constituted members of the board of examining physicians of the American Red Cross are in charge of the rigid final tests to which each employee is submitted before he becomes eligible for a First Aid certificate.

In a recent annual interdepartmental First Aid competition held by the employees of the Chicago Rapid Transit Company, which operates the elevated lines in the city and its suburbs, nine teams, composed entirely of employees, entered. Keen rivalry marked the contest and its success is seen in that the winning team averaged 96.5 per cent in two practical problems. Further proof of the proficiency of the employees is shown by the many citations awarded them for meeting emergencies both on and off company properties.

Not only have First Aid educational activities been centered on employees of the Rapid Transit Lines but considerable effort has been expended toward education of the public. During the past year a First Aid team of picked experts gave 184 demonstrations before public gatherings aggregating 87,000 persons. The Rapid Transit Lines also has the distinction of having won the Chicago city championship in First Aid for two of the last three years.

A first aid team to represent the Rapid Transit Company in the annual Chicago city first aid championship contest is chosen from those recently graduated from the school.

St. Louis Building & Loan Association Thrives

THE net earnings from operations of the United Railways Savings & Loan Association, St. Louis, Mo., for the year ended Feb. 28, 1927, were $229,608. As of that date 5,871 members have $3,903,938 to their credit in the association upon the 52,377 shares, or an average of $665 per member. This incorporated building and loan association, with an authorized capital stock of $1,000,000, was organized in January, 1915, to promote home owning and to encourage thrift among the employees of the United Railways. Response to the share offering has been so active that the authorized capital stock has been increased from time to time until it has reached $11,000,000, divided into 55,000 shares, of which 52,377 are outstanding, of a par value of $10,475,400. The association has financed the building or purchase of 2,147 homes since its organization, aggregating loans in the amount of $6,006,096. The number of loans outstanding as of Feb. 28, 1927, was 1,386, aggregating $4,062,586.

A Short Life and a Sorry One for Melbourne's Jitney Buses

Australian Tramway Manager Gives Information on Relative Advantages of Privately Owned and Railway Owned Service

MOTOR BUS legislation in the Province of Victoria, Australia, was summarized in ELECTRIC RAILWAY JOURNAL for Oct. 30, 1926, under the title "Bus Legislation in Victoria, Australia, Proves Effective." The Melbourne & Metropolitan Tramways Board had secured the right to run buses in December, 1923, but success against the forays of wildcat operators did not come until the acts of Dec. 30, 1924, and Dec. 31, 1925, which demanded responsible service and a reasonable amount of taxation from any kind of motor bus operator, whether co-ordinating or independent.

The careers of various independent operators were succinctly stated Dec. 15, 1926, by W. O. Strangward, secretary of the board, before an inquiry of the Parliamentary Accounts Committee. The question was: "Can you give any information concerning the operation of privately owned buses? Can you say whether they are carrying on at a profit after making adequate provision for depreciation?" In reply, he said:

> The Melbourne General Omnibus Company ran for one year, whereupon its buses were seized by creditors who had expectations of possibly 2s. 4d. in the pound sterling, or 11 to 12 cents on the dollar.
>
> The Commonwealth Motors Company's five buses were seized by the creditors after nine months operation, but were already in deplorable condition. Creditors received 3s. 2d. in the pound, or about 16 cents on the dollar.
>
> The Trak Motors Company had 30 buses, of which fourteen were of London General Omnibus design and manufacture. These went back to London when the company failed, while the rest were sold around scrap prices. All the capital investment was lost, aside from losses by unsecured creditors.
>
> The Kintrak Company with nineteen buses lost them all for non-payment of installments. The company lost the whole of its capital. Two sightseeing buses of another company suffered the same fate.
>
> The Grey Motors, after a year's operation, had to quit when the makers seized their seven buses. The whole of the capital was lost. The Blue Line Motor Company, with eight buses, had a like end. The Press Motors lost its equipment to creditors, while the Royal Motors and Forrester Company gave up the business as non-paying.

Mr. Strangward estimated that Melbourne bus-selling concerns had lost at least £100,000 between 1924 and 1926 through selling on installments to unsuccessful operators. He figured that at least 80 per cent of the privately owned buses of Melbourne had been bought that way.

In his testimony Mr. Strangward drew up the following deadly parallel between the operations of independents and the board:

Private Enterprise	The Board
Buses usually poor and cheap-starved in maintenance.	Buses up to date and substantially built.
Interest on capital, small.	
No provision for depreciation or renewal.	Twenty per cent allowance for depreciation.
Frequently purchased on time payment.	Heavy interest and sinking fund on cost of bus.
Inadequate garage accommodation.	Adequate upkeep and maintenance.
No attempt to provide an adequate "all day" service.	An adequate, dependable and regular "all day" service is provided.
Owner-drivers "lay off" for meals and at slack hours, spreading their work over two widely separated peaks. They are thus able to pick up the cream of the traffic.	Meal reliefs are provided by additional drivers. Excessive spreads are met by the employment of additional crews.
Cases have been reported of owner-drivers spreading their work over fifteen or sixteen hours a day.	Each man is paid for at least 48 hours per week, although in many cases only 42 hours work can be found for them.
Seeks payable routes only.	The board's buses are run on two "developmental" routes, viz., at Williamstown and from Victoria Bridge to Balwyn Road. A portion of the latter route was exploited by privately owned buses, found unpayable and abandoned. The balance of the board's buses are used to provide a "stop-gap" service while cable tramways are being converted to electric traction. The sides of these "conversion" streets are congested and the surfaces are unfit for bus operation. This causes excessive maintenance and extra fuel consumption and slows down and disorganizes the service.
No concession fares or free traveling.	The board allows school children and others to travel at concession fares and also allows certain free traveling.
Very few restrictions as to working conditions.	Practically in line with tramway operation. For example: Drivers are paid 1½d. (3 cents) per hour extra for driving one-man buses. Time and a quarter on Sundays. Time and a quarter for "spreads." Employees are supplied with uniforms free. Two weeks annual holiday is granted on full pay, also sick pay allowance, etc.
In some cases female conductors are employed at wages much lower than those paid to male conductors.	No female conductors are employed.
Owner-drivers effect their own running repairs.	Board is compelled to employ mechanics to effect all repairs. For example: At Williamstown three shifts of mechanics are maintained to effect repairs to the three buses in operation.
No inspectors or supervisors.	Board requires supervisors.

It is apparent that evolution toward unified service has gone the same course in Australia as in America, but the process has been faster because the officials of the board kept a keen eye on the development of jitney-bus operation in America and Great Britain and therefore were better prepared. It will be recalled that during the summer of 1925 Mr. Strangward visited the United States and Canada to get a first-hand view of transport progress in America.

Tests of Worm-Drive Car Show Reduced Noise

Mayor Parker of Springfield, Mass., and President C. V. Wood of the Springfield Street Railway just before boarding experimental worm-drive car for demonstration run

Initial tests with apparatus developed by noise reduction committee of American Electric Railway Engineering Association show worm-drive car considerably quieter than conventional car. Additional features of brake, safety and door control equipment are outlined

FURTHER data concerning the experimental worm-drive street car built for the Springfield Street Railway, Springfield, Mass., have recently become available. These include the results of noise tests conducted by H. S. Williams, chairman of the noise reduction committee of the American Electric Railway Engineering Association, together with details of the novel control and brake equipment on the car. A general article on the body and truck design was published in the March 26, 1927, issue of ELECTRIC RAILWAY JOURNAL. The noise tests were referred to briefly in a communication from C. V. Wood, president of the railway, published in this paper last week, page 822.

The noise tests were made with measuring apparatus which is in process of being developed by Mr. Williams' committee. Although the measuring apparatus itself is still in rather rough form and does not give quantitative results which permit the effects of various sounds on the human ear to be evaluated, it afforded an approximate means of making a comparison between the sounds set up in the new car and those encountered in one of the conventional type cars in service on the Springfield property. The measuring device makes use of radio tubes for converting the sounds produced into electrical impulses which actuate the pen of a sensitive recording meter.

A reproduction of the charts produced on the new car and on one of the standard spur-gear-driven cars on the property, is shown in an accompanying illustration. Although the tests are of only a preliminary nature, the striking contrast obtained is considered by those who conducted the tests to give an indication of what can be expected from further attention in car design to the matter of noise reduction.

In interpreting the results of the tests, Mr. Williams calls attention to several factors which should be taken into consideration. The new car weighed only 25,300 lb., while the conventional car with which it was compared weighed 48,390 lb. Since the noise resulting from impact between wheel and rail was considered to be related to the car weight, it was felt that the new car had an inherent advantage in this respect. In so far as the weight reduction is the result of reduced motor weights made possible by the worm-drive design with complete spring support of the motors, however, the new car is entitled to credit for the improvement.

One other factor to be taken into consideration in interpreting the curves is that the experimental car was entirely new, with no wear on the various running gear parts, whereas the conventional car had been in service for a number of years and was not specially prepared for the tests. It was, however, considered to be in first-class operating condition. During the tests the new car was run at slightly lower operating speed than the conventional car.

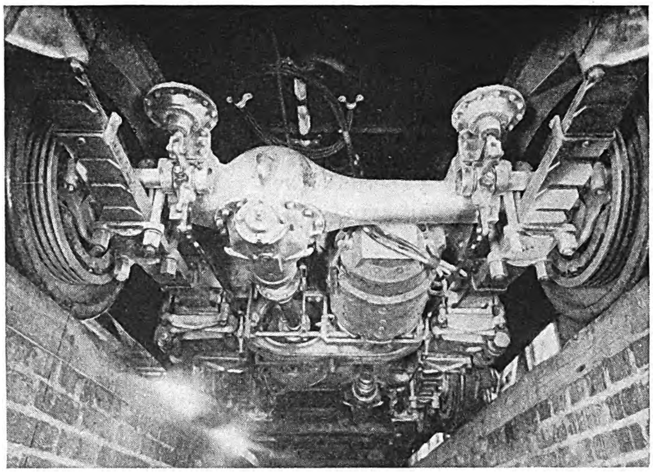
The comparative noise made by the two cars is shown

by the charts. They read from right to left, the upper chart being for the old car and the lower chart the results on the new car. Both cars were run over the same track and the various locations and track conditions are shown, so that comparisons of noise can be made for the same track locations. The effects of special work and rail corrugation are strikingly shown. Comparison of the noise values on identical pieces of track may be made by means of the street locations indicated on the charts. The variations in car speeds over these sections for the two tests represent the only definite variable introduced. In the section of track between Maple and Hancock Streets on State Street the effect of the new design in reducing the noise over corrugated track is clearly indicated.

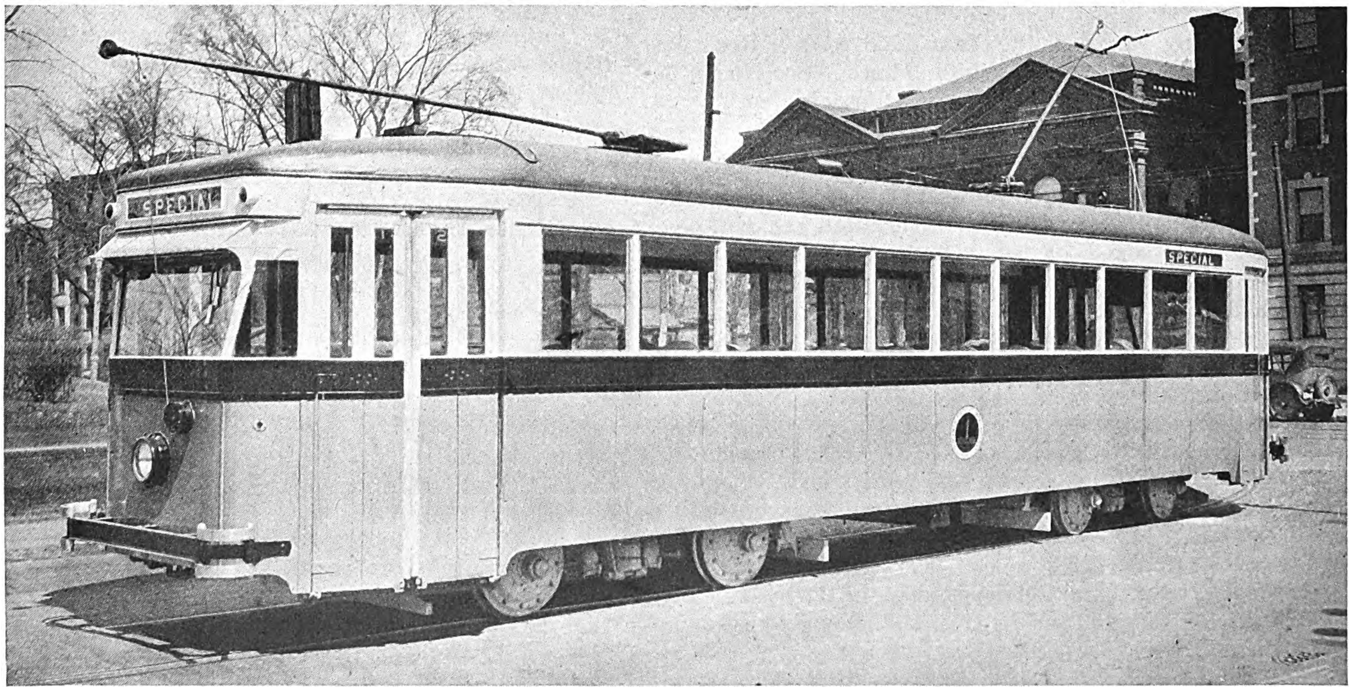
NOVEL FEATURES IN CONTROL AND BRAKES

As described in the previous article on this car in the March 26, 1927, issue of ELECTRIC RAILWAY JOURNAL the brakes are automotive type with Westinghouse brake diaphragms mounted directly on the axle housings and with internal expanding shoes inside brake drums bolted to each wheel. Use of a vehicle type master controller with 24-volt battery current control of the contactors mounted under the car is another novel feature of the equipment that was described in the previous article. But even more radical departures from general practice are represented in the brake control, safety features and door control arrangement. All of this is full electro-pneumatic so that no air pipes except that to the air gage are brought above the car floor in the vestibules. One reason given for the adoption of this arrangement was elimination of the air pipes leading to the brake valve at the operator's location.

A piping and wiring diagram for the various air devices, which include full safety car devices and treadle-operated exit doors, is shown in an accompanying illustration. The motorman's brake handle functions merely as a device for completing electrical contacts to the various remotely located electro-pneumatic valves. To apply the brakes in service application, or to release them, the electrically controlled service or release valves, as the case may be, are actuated when contact is made by moving the brake handle to service application or release positions. Operation of the service valve admits air from the reservoir line to the brake diaphragms, while the release valve, when its contact is made, exhausts brake pipe air to atmosphere just as is done in a conventional brake installation. These electrically controlled valves merely perform the functions of the service application and release ports in the customary brake valve.

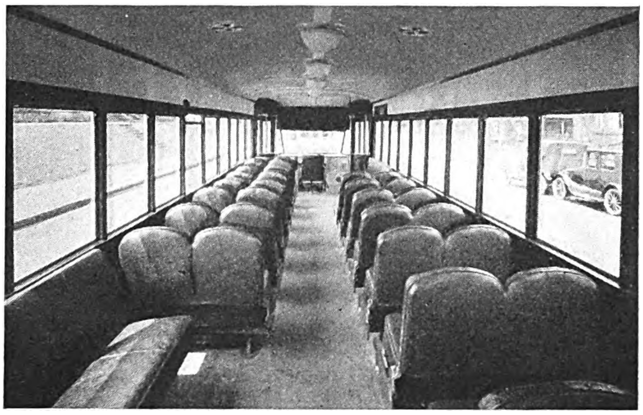

A view looking up under the Springfield car. The motor and driving gear arrangement are clearly shown together with the mounting of springs and brake rigging

A K-1 type emergency valve is included in the equipment. It functions to dump reservoir air directly into the brake diaphragms to give emergency application of brakes, balance door engines, sand rail and trip off power, when the electrically controlled valve *A* in the diaphragm is opened to atmosphere. This emergency action is caused by moving the brake valve control to



Three-quarter view of worm-drive car showing clear vision obtained for operator by automotive type windshield. Sloping glass relieves him from glare of interior lights at night. Streamline appearance is obtained in this design the extreme right-hand position, as is done on the standard safety devices equipment, by release of the motorman's foot switch without having the air brakes set, or by pulling a passenger's emergency switch in the center of the car.

Service application of sand is also electrically controlled through magnetic valves indicated on the diagram. Doors are operated through an electrical contact on the brake handle in a position similar to that on the standard safety devices equipment. The operation is through magnetic valves in the door equipment. Selector switches are arranged conveniently for the operator so that he may open either front or rear door or both, by moving the brake handle to door open position. While the treadle-operated door at the rear of the car remains open to discharge passengers, the brakes cannot be released, nor can power be applied to start the car.



Interior of Springfield car looking forward. Note the absence of top sash, the flat roof and clear view from operator's position

Nashville Railway Betters Accident Record

The Company Finished the Year 1926 with a Record of 73 "Zero Days" on Which There Were No Accidents—Eighty Trainmen Participate in Bonus for Going Through Entire Year Without an Accident

WHEN the Nashville Railway & Light Company operated its cars 66 days without an accident in 1925 it was looked on as something of an accomplishment. Working to better this record, Superintendent H. A. Davis continued the campaign during the past year without relaxation. As a result the transportation department went through the year 1926 with a record of 73 no-accident days.

The 400 trainmen averaged 16,905 car-miles per chargeable accident, against 15,487 in 1925. Considering all accidents, they went 6,852 car-miles for each accident, chargeable or non-chargeable, compared with 6,600 in 1925. The record has been improving year after year ever since 1922, when 1,779 accidents were recorded. In 1923 the number fell to 1,418, in 1924 to 1,205, in 1925 to 840 and in 1926 the record was down to 829.

COMPARATIVE ACCIDENT RECORD OF NASHVILLE RAILWAY & LIGHT COMPANY FOR 1926 BY CAR LINES AND BY DIVISIONS

Car Lines	Total Accidents	Car-Miles per Total Accidents	Chargeable Accidents	Car-Miles per Chargeable Accidents
Belmont	62	6,310	24	16,300
Radnor	50	10,882	17	32,005
Cedar St.	22	4,965	6	18,207
St. Cecilia	10	9,986	7	14,266
West Nash	77	9,323	30	23,928
Woodland	62	8,578	19	27,990
Wharf Ave.	15	5,509	6	13,772
Fairfield	55	5,112	30	9,372
Shelby	21	12,038	8	31,601
Meridian	39	6,345	15	16,496
Glendale	76	6,670	29	17,481
Cal.-McFerrin	10	6,234	4	15,584
Kayne Ave.	21	4,846	11	9,252
Jo Johnston	22	4,553	11	9,106
Jefferson	54	4,300	20	11,560
Hillsboro	78	4,710	44	8,351
Buena Vista	39	6,572	13	19,716
Broadway	87	6,783	32	18,445
South High	5	8,036	3	13,393
First St.	24	5,054	7	17,328
Owls	0	42,636	0	42,636
Divisions				
South	125	7,584	56	16,929
West	98	8,439	36	22,974
East	156	7,793	53	22,938
So. West	324	6,042	140	13,982
North	125	5,507	51	13,498

A striking feature of the year was that there was a decrease in the number of automobiles struck by street cars from 252 in 1925 to 190 in 1926. As an indication that this was not due to safer driving of the automobiles, the accidents in which the latter struck the sides and rear of street cars went up from 272 in 1925 to 286 in 1926.

Of the 400 men, 80 motormen and operators went through the entire year without a chargeable accident. For this record they will share in a bonus of $1,000 donated by the company.

The spirit of competition which has been a feature of past years in Nashville was continued, and this was probably the primary cause of the excellent record. Two types of comparison are made, one for the various car lines, the other for the five operating divisions. Each month the computation is made of the total number of accidents, car-miles operated and car-miles per accident. The same is done for chargeable accidents. The accompanying table shows the final record for the year for each of the car lines and for the divisions. The best record for all accidents was that of the Shelby line, which ran 12,038 car-miles per accident. Counting only the chargeable accidents, the Radnor line went 32,005 miles for each one reported. It is interesting to note that the owl cars ran the entire year without having a single accident of any character.

Details of the methods used for accident prevention were published in this paper Oct. 31, 1925, page 784.

Market Street Railway Advertises City and Railway Growth

THE Market Street Railway is a believer in consistent advertising in San Francisco, where it furnishes three-fourths of the electric railway service. The March issue of *Byllesby Monthly News* states that in one of its recent advertisements, under the heading "It's Interesting to Know," many pertinent facts were recorded. Among these were the following:

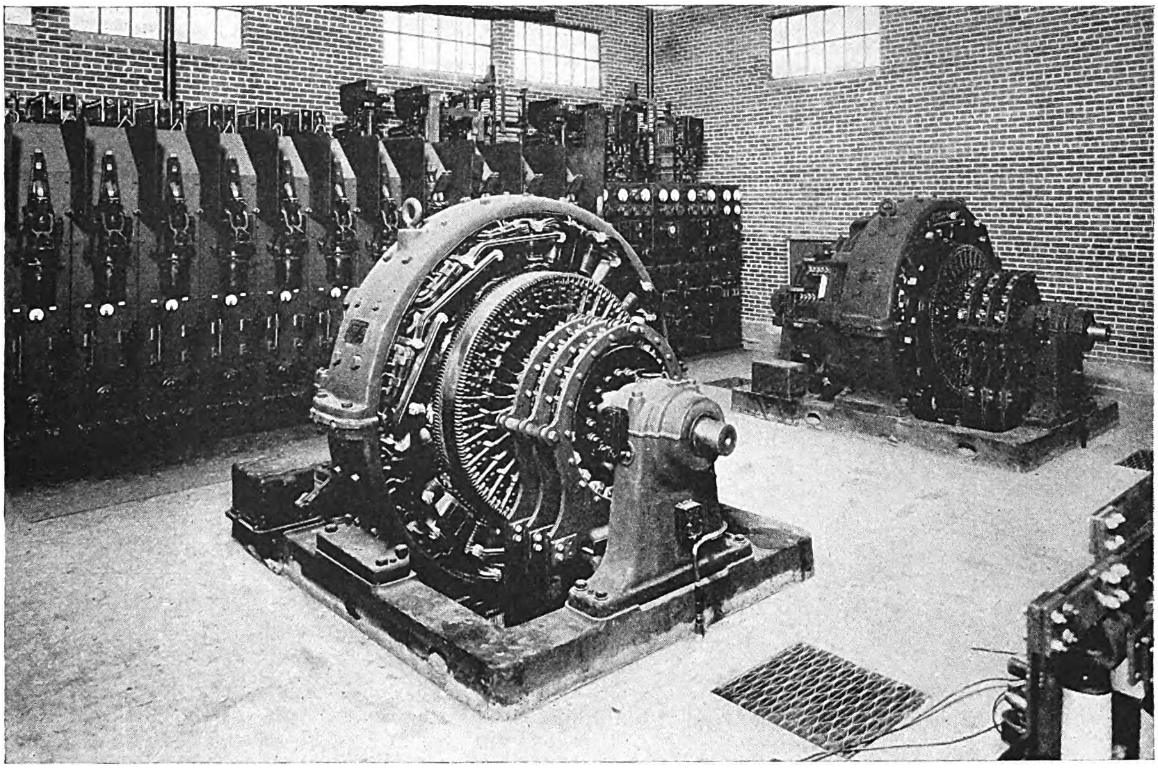
That San Francisco has consistently increased in population at the rate of about 30,000 annually for the past ten years.

That in this city there are 2,198 industries.

That there are 1,600 hotels here.

That San Francisco has 44 public parks and 27 playgrounds for children.

That this company built 28 new street cars in San Francisco shops in 1926 and manufactured in those same shops almost all the vast amount of maintenance material required for its 700 cars and 295 miles of street car lines.



All automatic control panels in the Grimm Avenue substation are located on the right end of the switchboard

New Automatic Substation

for the Chicago Surface Lines

Supervisory control has important part in scheme of operation. No load shifting resistors are used. Comprehensive system of natural ventilation

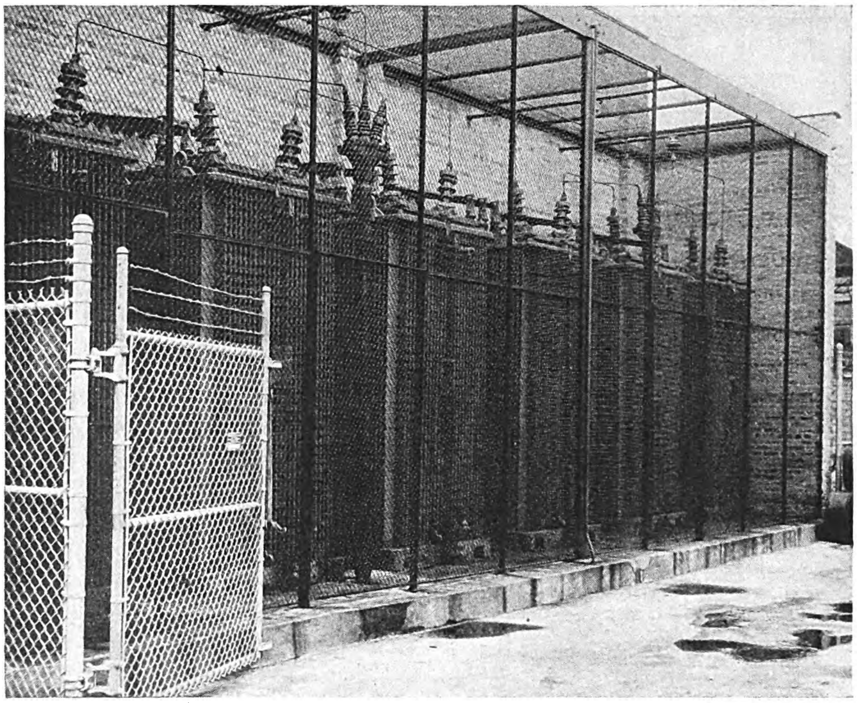
By B. G. Noah

Engineer of Tests Chicago Surface Lines, Chicago, Ill.

RECENTLY the first automatic railway substation to be used in Chicago was put in operation by the Chicago Surface Lines. It is designated the Grimm Avenue substation and is located near the intersection of Milwaukee and Lawrence Avenues in the northwest section of the city. It contains two 2,000-kw., 600-volt, 60-cycle synchronous converters, which provide sufficient capacity to take care of the present load with some reserve for future extensions. At present six sections are fed from this substation, three being ties with the Crawford Avenue substation and three stub-end feeders.

Grimm Avenue substation is supplied by two 12,000-volt, 60-cycle underground lines. These lines terminate in a high-tension switching compartment located inside the building and are connected to a common bus through line oil circuit breakers. The primaries of each bank of transformers are connected to this bus through an oil circuit breaker and a short section of underground cable. This cable terminates in the transformer compartment at the rear of the building. The transformers are of the single-phase, oil-insulated, self-cooled, outdoor type. Their secondaries are connected to the respective converters through starting and running oil switches. The interconnections between transformers, secondary switches and converters are made with 1,500,000-circ.mil lead-covered cable which is run in fiber conduit.

The synchronous converters are six-phase, compound-wound, commutating-pole machines. They have 100 per cent shunt field windings and are operated with the series field winding short circuited. The direct-current

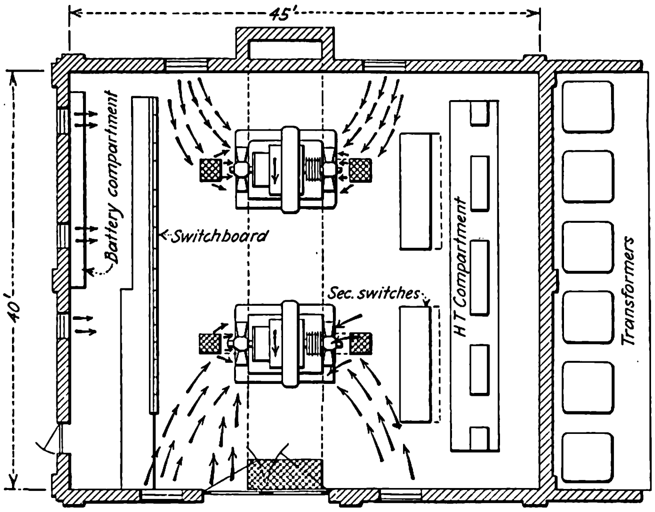


Transformer compartment at rear of building

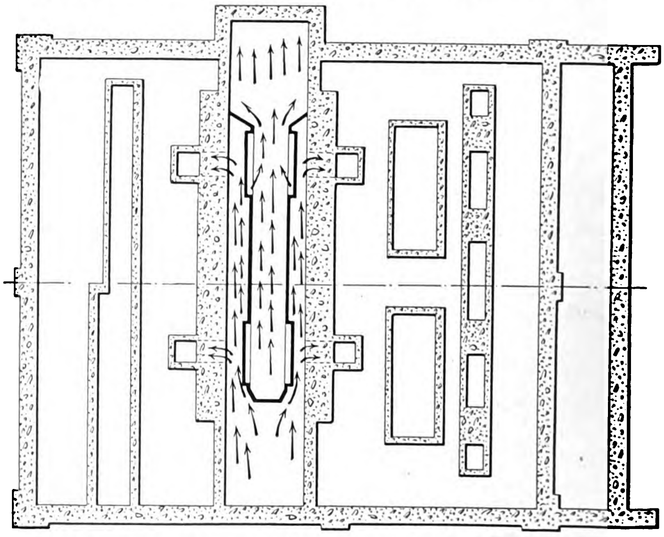
voltage of the machines drops 5 per cent between no load and full load when operated in this way. The necessary equalizer contactors and connections are installed so that the machines may be operated as compound units in the event that a constant or rising d.c. bus voltage is desired.

As is common practice the leading machine is started automatically with a sustained low direct-current bus voltage, and the second machine is in turn started on sustained overload on the first. The machines are shut down in the reverse order due to sustained underload. Either can function as the leading machine, the order being governed by the position of a manually operated sequence switch. All of the protective features of the modern automatic substation are included. Each machine is protected from severe short circuits on the direct-current side by two parallel-connected high-speed circuit breakers in its positive lead. These breakers are paralleled by grid resistors. When a short circuit occurs these breakers will open and introduce the grid resistors into the circuit, limiting the load on the machine to its commutating capacity. Opening of the high-speed breakers is followed immediately by the opening of a 6,000-amp. carbon circuit breaker which is also connected in the machine positive lead. This entirely disconnects the machine from the direct-current bus. The circuit breaker on the grounded feeder will also open, after which the high-speed breakers will reclose. The carbon circuit breaker will then reclose under the supervision of a voltage balance relay. The circuit breaker on the grounded feeder will not reclose, however, until the ground is removed. These feeder circuit breakers are of the short-circuit detector, service restoring type and have a rating of 3,000 amp. An auxiliary direct-current bus is connected to the main bus through an auxiliary feeder breaker. With this arrangement any section may be fed through the auxiliary circuit breaker when it is desired to make tests or repairs on any one of the regular feeder equipments. The scheme of operation differs from that of the usual automatic substation in one respect, i.e., no load shifting resistors are used. Two factors are involved in making this method of operation possible: First, the low effective resistance between this and the Crawford Avenue substation to which it is tied, and second, the inherent voltage characteristics of the machines in this substation and those in Crawford Avenue. As mentioned before, the machines at Grimm Avenue have a drooping voltage characteristic, whereas the two 4,000-kw., 25-cycle synchronous converters in the manually operated Crawford Avenue substation have a 1 per cent rise in direct-current voltage between no load and full load. In times of abnormal load demand, due to resumption of service after a street blockade, etc., the voltage on the Grimm Avenue substation will be reduced automatically and a portion of the overload will be shifted to the Crawford Avenue substation through the low resistance tie sections.

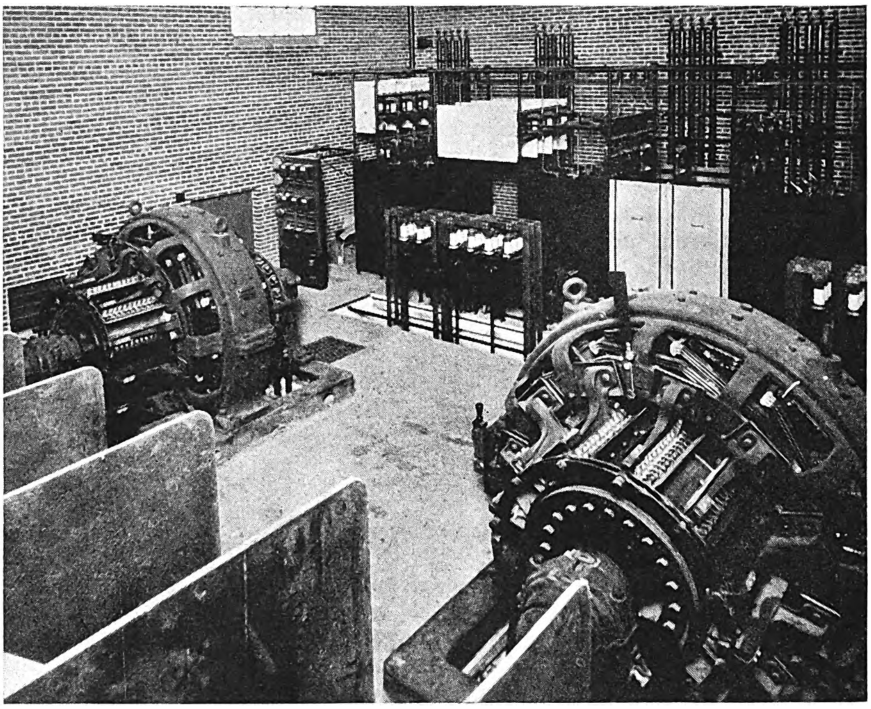
In addition to the above described automatic features



Floor plan of substation. Air is drawn in through four louvers in the side walls



The pit under machines is separated into two compartments by a steel partition



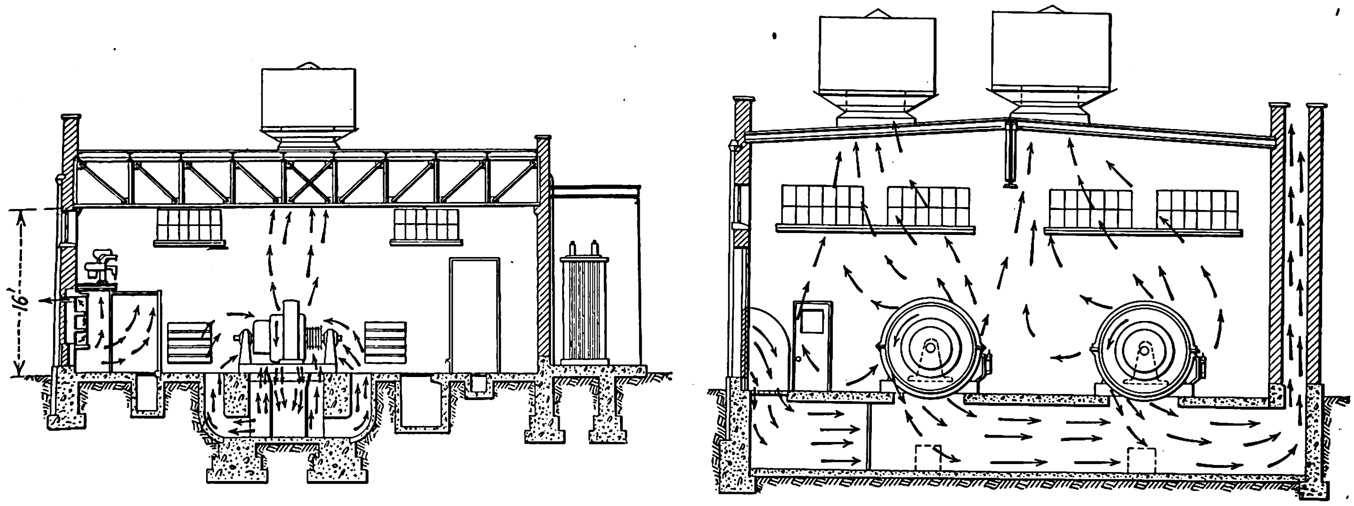
High-tension switching compartment of the Grimm Avenue substation

this substation is equipped with a synchronous visual supervisory control system. The office or control end of this system is located in the Crawford Avenue substation, the operator of which has complete control of the equipment at Grimm Avenue. He can start up, shut down or lock out either or both machines and at all times has a visual indication of the load on each. He has indication when a machine is operating but not connected to the line due to extremely low direct-current bus voltage. He is able to open and close all feeder circuit breakers, has visual indication of the position of the oil circuit breakers on the alternating-current incoming lines, and of the conditions of the operating battery.

In effect, the supervisory control system makes Grimm Avenue substation a part of the Crawford Avenue substation. The major portion of the Grimm Avenue load is common to both and the equipment in both is under the control of one man. This arrangement is of particular value in case of an outage at Crawford Avenue or a general outage of the entire system. In such an event the load on Grimm Avenue can be held to the capacity of the machines by switching on the feeder section at either Grimm Avenue or Crawford Avenue substations. For example, if Crawford Avenue has an outage the operator will open the Grimm Avenue tie feeder at Crawford Avenue. This operation makes all Grimm Avenue section stub-end feeders. If this overloads the machines at Grimm Avenue, he can disconnect the least important feeders from that substation bus until Crawford Avenue is again in service or the load on Grimm Avenue is reduced enough to allow the closing of the feeders.

If the outage at the Crawford Avenue substation occurs while Grimm Avenue is out of service due to low load demand the bus voltage at Grimm Avenue will be excessively reduced. The leading machine will then start. The action of the voltage balance relay, however, will prevent its direct-current circuit breaker from closing if the bus voltage is so reduced that the machine would pick up sufficient load to trip it out again. This condition is indicated at Crawford Avenue through the supervisory control. The operator will then reduce the value of the connected load at Grimm Avenue by opening the three tie feeder breakers at that substation.

It is obvious that this operation will reduce the Grimm Avenue bus voltage to zero. However, the three tie feeder circuit breakers are interlocked with the voltage balance relay through the supervisory interposing relays and will allow the leading machine circuit breaker to close and carry the load on the remaining three stub-end feeders. The operator can then increase the load on the station by closing one of the tie feeders. This increase in load will bring the second machine into service and the remaining tie feeders can then be closed. These tie feeders must be opened at the Crawford Avenue end during this switching operation if that substation is still out of service. In this way the machines at Grimm Avenue can be used to their full capacity during abnormal times without reducing the voltage on the sections it is feeding.



These cross-sectional views indicate the methods used in the natural ventilation system

The supervisory control also becomes invaluable in the event of fire or other accidents when the hazard of live trolley wires must be removed as quickly as possible. This emergency arises quite frequently on a metropolitan system and it is merely necessary to call the Crawford Avenue operator by telephone and he in turn can open the feeder in question at the Grimm Avenue substation through the supervisory control.

The substation building is 40 ft. wide, 45 ft. long and 21 ft. high. Its volume per installed kilowatt is 9.835 cu.ft. The accompanying illustrations show the arrangement of the equipment.

NATURAL VENTILATION IS USED

The scheme of natural ventilation is illustrated in the four accompanying sketches. The arrows on one sketch indicate the direction of air as it is drawn into the building through the four louvers in the side walls. These louvers are 4 ft. square. The direction of the warm air as it is exhausted from the periphery of the armatures is also indicated. The upper portion of this air is discharged from the building through two 54-in. roof ventilators, and that exhausted below is conducted out of the building through the stack shown on the right side of the sketch. Other sketches show the arrangement of the pit under the machines. This pit is separated into two compartments by a steel partition. The sides of this partition are in the neutral air zone between the pressure and vacuum areas. The warm air is discharged from the lower part of the machines into the center compartment, from which it is exhausted through the stack. The cool air, which enters the outer section of the pit through the louvers and floor grating, is drawn into the machines parallel to the axis of the shafts through the floor ventilators. A portion of this air is also drawn into the machines through the upper openings of these outer sections. This arrangement provides free circulation for the incoming air and reduces recirculation of the warm air discharged from the machines to a minimum.

Evansville Company Names Cars After First Settlers

TWO of the four new cars which were ordered recently for use on the Evansville and Princeton, Ind., traction lines have recently been put in service by the Southern Indiana Gas & Electric Company, Evansville, Ind. The cars, of the one-man type, are named after prominent men who figured in the history of Gibson County, in which the city of Princeton is located. The "John Stevens" is named for the first settler of Gibson County, who settled there early in 1789, after serving a period of service in the Revolutionary War. The "William Prince" bears the name of the man for whom the city of Princeton was named. Still another car, styled "Aaron Le Grange," is in honor of the first settler in the town of Fort Branch, which formerly was called Le Grange, and the fourth car, "Henry Haub," is in remembrance of the first man who settled in the town of Haubstadt, which is one of the important stops on the Evansville and Princeton traction line. The new cars are to replace the oldest in service, used on the line since its opening in 1903. The company also has purchased several new one-man cars for operation on the Bellemeade line in the city. According to recent announcements, the purchase of several new buses during the coming year is planned.

California Motor Transport Shows Declining Profits

Railroad Commission Reports Reveal Low and Decreasing Profits—Similarity to History of Electric Railway Industry Shown by Comparison

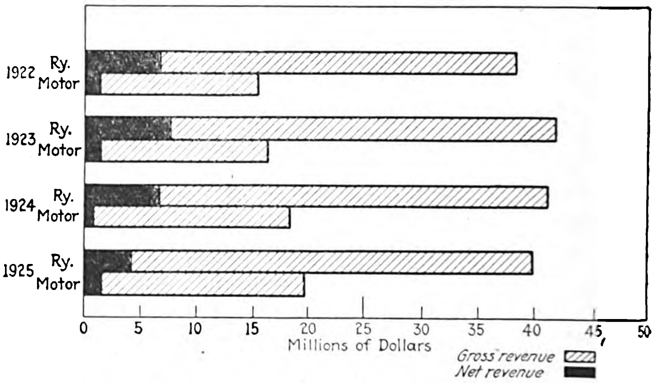
BY GEORGE K. MCCABE

Department of Economics, Sociology and Government,
Yale University, New Haven, Conn.

IS MOTOR bus and truck operation profitable? This question is uppermost in the minds of all students of transportation today, and in an attempt to analyze this question a study was made of the common carrier motor bus industry in California. This state was selected as being the most favorable to this class of transportation.

Six conclusions are drawn from a perusal of figures supplied by the California Railroad Commission. First, the motor transport industry in that state considered as a whole has a very high operating ratio with a consequent low net income. Second, the increase in volume of business has been slow, especially that resulting from passenger traffic. A third conclusion is that the loss of passenger business of the electric railways cannot be attributed to motor bus competition.

If the rate of depreciation and maintenance charged in 1922 had been maintained in 1925, the rate of return on the bus and truck industry of California would have been less than 1 per cent. This would have been even less than the 2⅛ per cent return for the principal electric railways of that state in 1925, based on the investment in plant and equipment. Other findings indicated that the declining profits in motor bus operation may be due to the partial payment plan of purchasing new equipment and unreal profits which may actually be accrued depreciation.

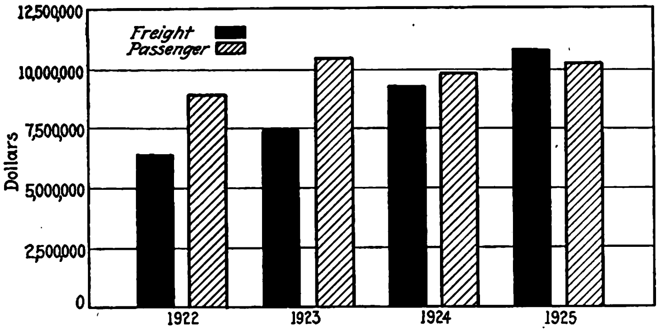


Comparative electric railway and motor transport earnings in California, 1922-1925

Electric railway revenues for 1925, on the other hand, were higher than in 1922 although lower than in 1923-1924. This points to the inability of electric carriers to increase freight and express business as the motor carriers have done.

The study of the motor transport revenues from 1922 to 1925 inclusive shows that the combined receipts from passengers, freight, express and mail net the owners a return of about 7½ per cent on the $19,000,000 of investment in the industry. This return is after deducting a depreciation charge of 12½ per cent, which assumes a vehicle life of eight years. For a new and flourishing industry 7½ per cent would seem to be a low return. This rate of return on the investment is especially ominous in that it has fallen from 10½ per cent in 1922 to 7⅓ per cent in 1925. This is not due to increases in the allowance for depreciation. On the contrary, this has been reduced from 13½ per cent of the investment in the early years to 12¼ per cent since 1922. So, too, have the maintenance and repairs fallen from 23 per cent of the investment to 16½ per cent. Had the operators kept these charges as high as they were in 1922 the profits would have returned less than one-half of 1 per cent on the investment in 1926.

It should be remembered that the gloomy conclusion that the industry may be living on its capital is true only of the industry taken as a whole for the state. Individual operators favorably situated may be earning a high rate of return on their investment after deducting adequate allowances for depreciation and maintenance.



Passenger and freight receipts of motor transport industry in California, 1922-1925

Data supplied by Railroad Commission of California. Revenue includes freight, express, mail, baggage and other goods traffic.

Turning to the first chart, it is apparent that the 50 per cent increase in gross revenue since 1922 has been more than offset by increased expenses. The operating ratio, based on the expenses, including depreciation, maintenance and taxes, has fluctuated between 92 per cent and 96 per cent. In 1925 the operating ratio was 93½ per cent. The only expenses that have risen out of proportion to the increase in receipts have been "taxes and licenses" and "salaries and office expenses." Taxes were twice as high as in 1922 and office expenses five times the 1922 figure.

The high operating ratio given above is probably due more to the slow increase in receipts rather than to the increased operating expense. The passenger business has risen only 14 per cent in four years, although the freight has increased 72 per cent. The second chart shows the yearly changes in these figures. A comparison of these two rates of increase seems to point to the freight business as the more profitable part of the traffic.

The comparison of the gross receipts of the eight principal electric railways with the gross receipts of the motor industry shows that these railways carry twice as much business as the highway transport industry. The railways considered are: Key System Transit Company; Market Street Railway; Pacific Electric Railway; San Diego Electric Railway; San Francisco, Napa & Calistoga Railway; San Francisco-Sacramento Railroad Company; San Jose Railways; Santa Barbara & Suburban Railways. The data on earnings of these companies are taken from Moody's Rating Book for Public Utilities, 1926. The amount of net income after taxes and depreciation, estimated at 5 per cent of gross receipts (more than company accounts allow), is more than five times the net income of the gasoline competitors. This favorable showing is neutralized by the fact that the electric plant and equipment represent about ten times the investment in the motor transport equipment. Consequently the rate of return on the investment in the electric railways averages about 3½ per cent, as compared with 7½ per cent in the motor transport industry.

ELECTRIC RAILWAY AND MOTOR TRANSPORT EARNINGS IN CALIFORNIA, 1922-1925

Data Compiled by Railroad Commission of California

	Electric Railway Lines		Motor Transport Lines	
Year	Gross Revenue	Net Revenue	Gross Revenue	Net Revenue
1922	$38,318,000	$6,613,000	$15,547,000	$1,226,000
1923	41,960,000	7,595,000	16,237,000	1,318,000
1924	41,169,000	6,774,000	18,232,000	810,000
1925	40,056,000	4,394,000	19,673,000	1,383,000

Net revenue is residue after payment of operating expenses, taxes and depreciation, but before interest.

Plan Schedule Adjustments Now for Reduced Summer Riding

By L. M. TRAISER

Special Traffic Engineer Chicago Surface Lines

On most urban transportation systems summer car riding falls materially below the average of fall and winter months. Greater use of automobiles is a factor in this reduction, but loss in school riding and the growing inclination to spend the summer vacation period in the country are the principal considerations.

In many cities the leading stores and business houses close at noon on Saturdays during July and August, the principal vacation months. This not only reduces the riding in the business district during the afternoon, but it gives the people an opportunity to go out of town and much evening riding is lost. This reduction starts soon after the shops close and is felt the remainder of the day.

On lines serving parks and other centers of recreation Sunday schedule adjustment will mean increased service, but it is necessary that the growing tendency away from Sunday street car riding in summer time be recognized and that schedules be trimmed accordingly, or that the increases for park lines necessary to handle the riding be made on an efficient basis. On park or beach lines summer service may be built in the form of a supplementary schedule to be used in full or in part, when and as needed. This permits service to be operated according to riding demands and the flexibility allows reduced operating costs during bad weather, when special attractions elsewhere reduce riding on these lines, and in the fall when the popularity of parks and beaches is waning.

Adjustments of weekday, Saturday and Sunday schedules to reflect the changed conditions of riding during the vacation months should be made early so that saving in crews and cars may extend over the entire period of reduced riding. To provide a basis for these adjustments the schedule man should be informed on the following features:

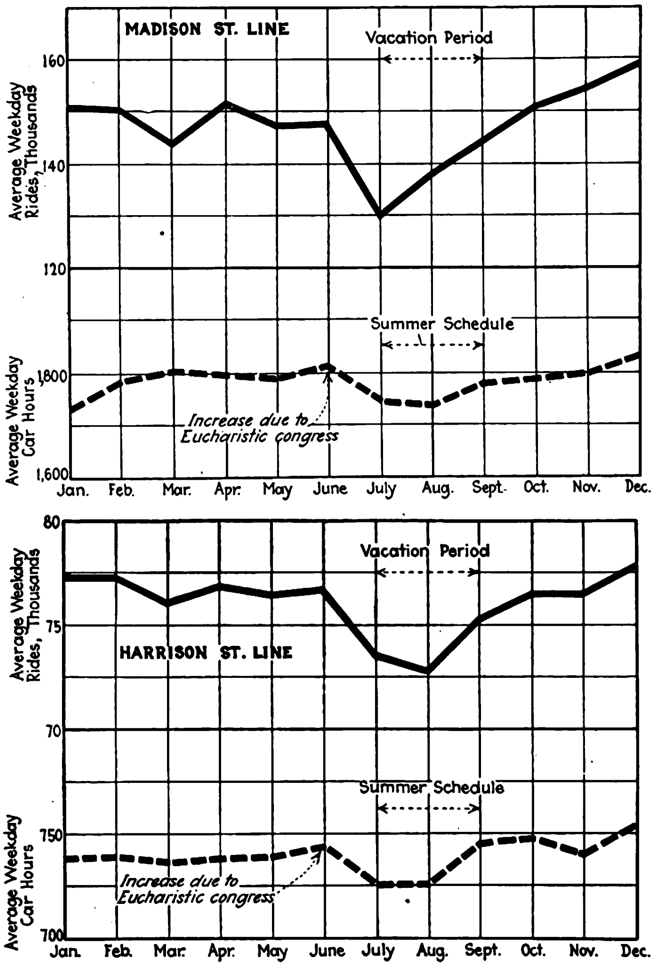
1. The lines on which school riding is important, the approximate number of pupils handled and the time at which this riding occurs.
2. The lines carrying during the rush-hour periods a

large proportion of office workers to and from the business district.

3. The probable effect of the vacation period, early closing hours and other factors on Saturday afternoon and Saturday evening riding.

4. The lines on which Sunday riding is materially different during the latter part of June and in July and August.

With this information at hand the schedule man will determine on which lines reduced riding can be translated into schedule changes and then at what periods of the day and on which sections of the line wider headway will function satisfactorily. He will make cuts where it is evident that service will not be needed.



Graphs showing decrease in summer riding and corresponding car-hour reduction in summer schedule on Madison Street and Harrison Street lines in Chicago

The management of the Chicago Surface Lines has met this summer reduction in riding during the past few years with careful adjustments on many of the lines. In 1925 plans were laid for week-day schedule adjustment on fifteen lines involving a reduction of between 35 and 40 runs and a reduction on ten lines after 2 p.m. on Saturdays.

The net result of summer schedule adjustments in 1926 on this property was as follows:

	Change	Cars	Man Runs
Weekday schedules	Decreased	49	61
Saturday schedules	Decreased	18	18
Sunday schedules	Increased	1	6

This represents a considerable saving in labor cost. In addition the reduction in car maintenance, power consumption and the release of cars for overhauling and painting represents a direct economy.

The Readers' Forum

Proposed Fire Protection Regulations Undesirable

NEWARK, N. J., May 6, 1927.

To the Editor:

In the May issue of *Aera* there appears in full the progress report of the National Fire Protection Association committee on garages, together with a review of the considerations which led up to the development of the present draft of proposed regulations. The attention of the street railways is specifically called to certain objectionable clauses which have been retained in the tentative draft now being submitted to the N.F.P.A. In this review particular attention has been drawn to the section on heating and ventilating and to that covering maximum floor areas and size and number of door openings in partition walls between sections.

As the A.E.R.A. representative on the N.F.P.A. committee Mr. Hecker has made a strong effort to secure an acceptable modification of obviously objectionable clauses in these proposed regulations, in some instances with success. In other important instances which vitally affect the railways, however, he has as yet been unable to secure modifications which, so far as opinion expressed to date by a number of railway men indicates, are highly desirable. It has been a case of one representative not having been able to present sufficiently convincing arguments to the balance of the committee to sway them to see these matters in the same light as he sees them, he having been supplied with views of only relatively few of the total number of properties affected.

Mr. Hecker has appealed to the railway engineers and others of the industry interested in the subject to study this report carefully and to see that any comments or criticisms are sent to him promptly so that he may be in a position to present them to the committee. This is a matter the importance of which cannot be emphasized too strongly. It is one that will affect every company building garages through its pocketbook, either in largely increased construction costs or through higher insurance rates, and may also have a serious effect on annual operating costs by reason of reducing the flexibility of use of a given total floor area.

The writer, as chairman of the way and structures committee, has been closely in touch with Mr. Hecker since this subject first came up for consideration and, realizing that only by prompt concerted action on the part of the railway interests can the desired modifications be secured, is taking advantage of the opportunity presented through your columns of emphasizing the importance of the matter to all street railway and bus operators, and in the hope that the appeal may in this way reach some who might not be reached through the other channels.

It is, of course, not expected that a 100 per cent acceptance of our views will be secured in the finally adopted draft of these regulations, as such regulations as these are always a matter of compromise, but no stone should be left unturned in the effort to secure the most acceptable compromise possible under the circumstances. It therefore behooves every street railway operator of buses to see that these regulations are given the most thorough study.

HOWARD H. GEORGE,
Chairman Committee on Way and Structures.

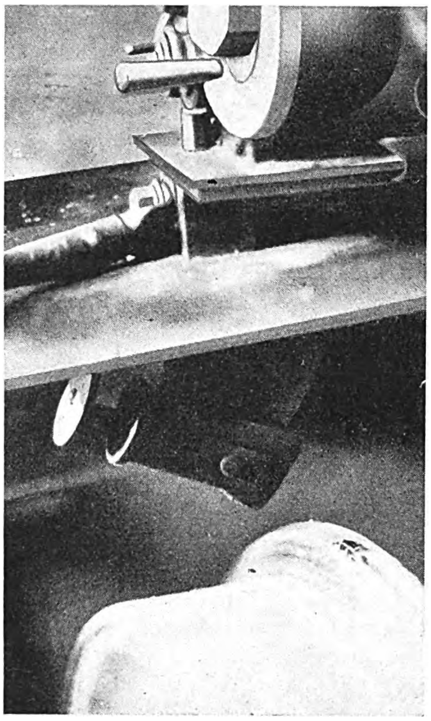
Maintenance Notes

Wheel Flanges Built Up by Welding

EXTENSIVE use is made by the Los Angeles Railway of automatic electric welding for building up the flanges of steel wheels. The machine used, with the exception of the head, which is a General Electric product, was designed and built in the railway shop. Many features of the machine make it especially suitable for handling this type of work efficiently and economically.

The main frame is built of 2½x3x¼-in. steel angles. The carriage way is about 5 ft. above the floor. Its length is approximately 6 ft. It is braced and gusseted to give it needed strength. The carriage also is built up of the same size angles and supports on top the reel of welding rod and below on a suspended rack the automatic welding head. A switch on top of the carriage is used for turning on and off the welding current.

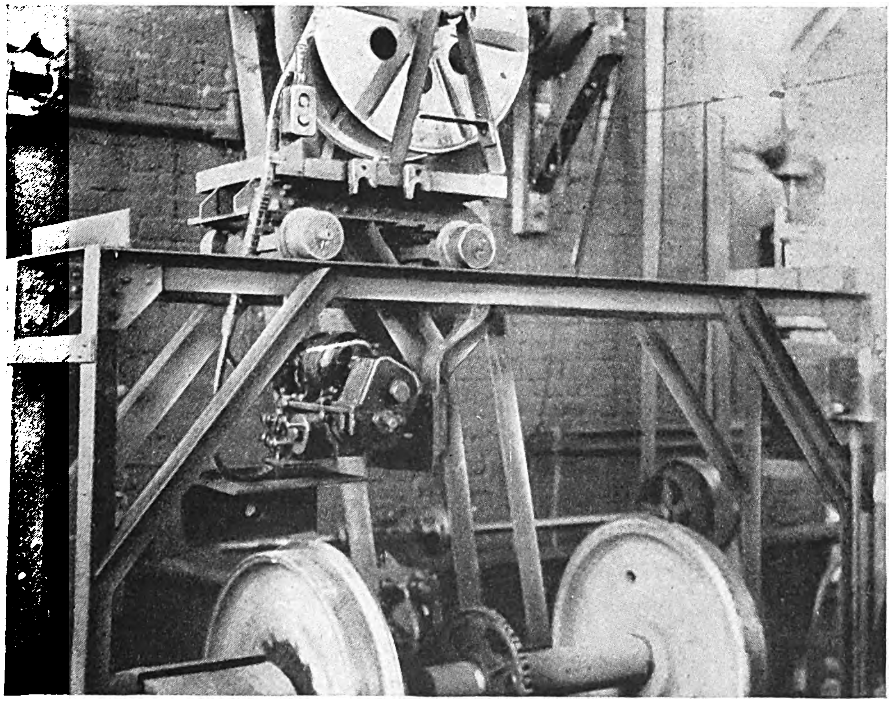
The wheels and axles are rolled in to the machine over a piece of track. When in the proper position mechanically operated jacks placed under the journal bearings raise the unit off of the floor. These jacks have brass bearings which permit the wheels and axle to turn freely. A split sprocket is clamped on the center of the axle. This serves to revolve the work. The drive to the sprocket is through a quadruple worm reduction from a countershaft at the rear of the machine. A motor is belted to this countershaft. The wheels and axle turn over once in every 7½ minutes, which gives the proper peripheral speed for welding a 30½-in. diameter wheel.



Close-up showing the head and welding point and the wheel set for building up of its flange

At the rear of the apparatus is another countershaft on which is mounted a wire brush so placed as to clean the wheel being welded. It is driven by the same motor which turns the wheel-driving mechanism.

With the wheels in position, the welding head is lined up with the point on the flange or wheel where welding is to be done, the proper adjustment of the point made, the welding rod feed motor and the wheel driving motor started. Then the device takes care of itself for the complete revolution of the wheel. It takes approximately one hour to build up a wheel flange sufficiently for turning to give the proper contour. The head and spool being mounted on a base which is capable of transverse movement, easy adjustment is possible to cover that portion of the wheel needing building up.

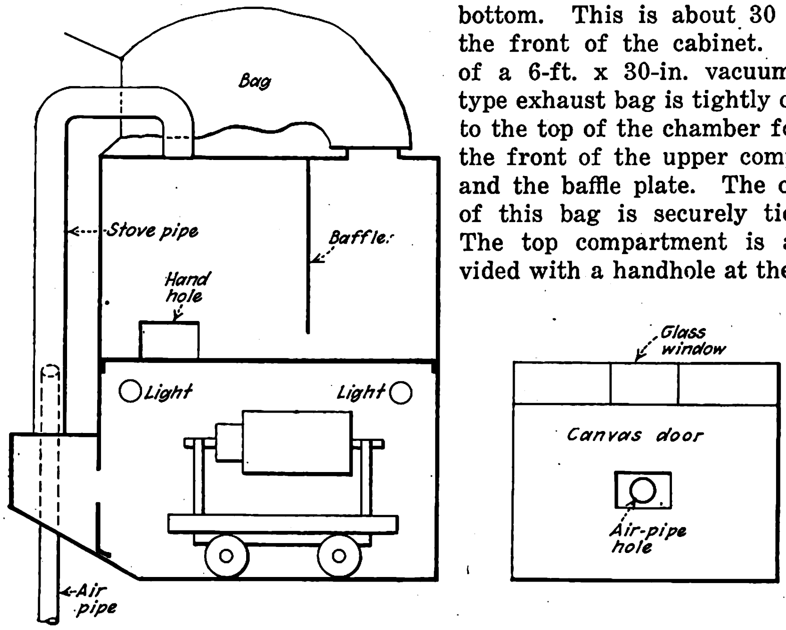


Apparatus used in the Los Angeles Railway shop for automatically building up by electric arc welding wheel contour and flanges. The carriage supports the rod supply spool and welding head

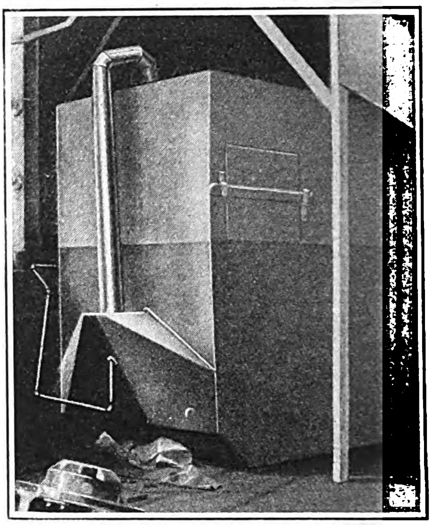
Dust-Absorbing Cabinet for Blowing Out Armatures

WHERE men work under healthy, sanitary conditions, maximum production is assured, since loss of time due to sickness is minimized. With this thought in mind the Interborough Rapid Transit Company of New York developed a cabinet for blowing out armatures and field frames which not only protects the operator from the inhalation of dust but absorbs all dust within itself.

This cabinet is made of $\frac{1}{16}$-in. sheet iron and is 6½ ft. long, 5½ ft. wide and 7½ ft. high. A horizontal steel partition divides it into a 3-ft. upper and 4½-ft. lower section. The front of the lower section is fitted with a canvas door containing a glass observation window and a hole for the entrance of the compressed air pipe. In the top of the upper section near the back and in the rear of the lower



A large vacuum cleaner bag above keeps the shop atmosphere clear



A specially designed cabinet in the Interborough shops absorbs the dust during the process of blowing out armatures and field coils

section near the bottom there are exhaust holes, to each of which is attached a 6-in. galvanized stove pipe. A 1-in. air pipe protrudes up into the stove pipe about a foot above the opening of the lower compartment. A vertical steel baffle plate extends down from the top of the upper section, full width, to within 8 in. of the bottom. This is about 30 in. from the front of the cabinet. One end of a 6-ft. x 30-in. vacuum cleaner type exhaust bag is tightly connected to the top of the chamber formed by the front of the upper compartment and the baffle plate. The other end of this bag is securely tied down. The top compartment is also provided with a handhole at the side for the removal of accumulated dust. The lower section is illuminated by four 100-watt lamps.

The armature or field frame is put into the lower section and the canvas door closed. Then the air in the stove pipe is turned on. The part to be cleaned is thoroughly blown out by means of an air pipe inserted through the hole in the door, the results obtained being observed through the glass window.

The direct air stream in the stove pipe, expanding into the upper section of the cabinet, creates sufficient suction effect to draw all of the dust from the lower section up through the stove pipe, depositing it in the upper section. Small particles remaining in the air as it makes its

Attention, Maintenance Men!

THREE CAPITAL PRIZES

***First,* $200 *Second,* $100 *Third,* $50**

TWELVE MONTHLY PRIZES OF $25 EACH

SHORT maintenance articles for ELECTRIC RAILWAY JOURNAL's maintenance competition are being received. Those published in the Maintenance and Construction issue for May will have the first chance to win one of the prizes. Maintenance men, here is your opportunity! The more items you send in, the more chances you have of winning a capital or monthly prize. Start at once. The JOURNAL will pay $5 for each item published, whether it wins a prize or not.

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 each will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

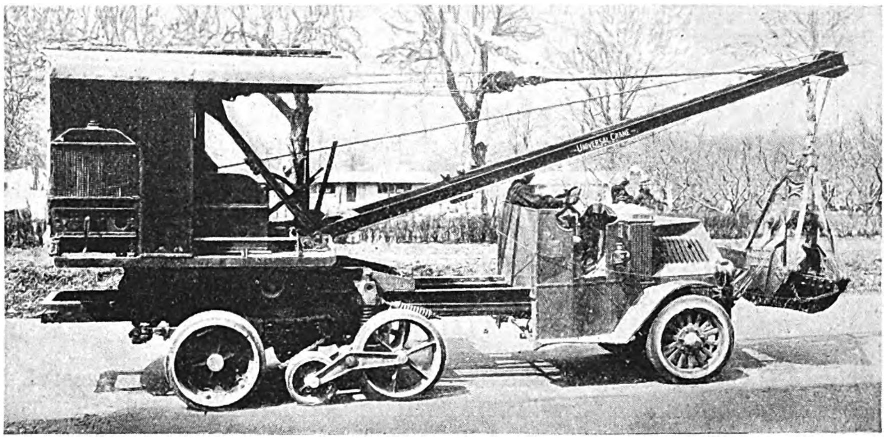
exit through the bag are deflected by the baffle and caught in the bag.

To clean the cabinet, the tied end of the bag is loosened and raised vertically so that the contents will be deposited in the upper chamber. By removal of the handhole cover in the side of the upper section the accumulated deposit can be removed.

New Orleans Leads in Mileage Per Pull-In

IN A SHORT article in the April 23 issue of ELECTRIC RAILWAY JOURNAL, page 745, a statement was made that Atlanta is leading the "Southern League" of Street Railway Companies in mileage per pull-in with an average of 26,041. The mileage given per pull-in was substantially correct, but Atlanta is in fourth place instead of in the leading position. In the last report of the Association of Equipment Men, Southern Properties, New Orleans headed the list with 100,833 miles per pull-in, Nashville was second with 45,000, Knoxville third with 32,524 and Atlanta fourth.

New Equipment Available


Crane equipped as an eight-wheel truck. Its speed is 16 m.p.h.

Removable Crawler Tread for Crane

CONVERTING a rubber-tired truck into one with full crawler rear wheels is the duty of an attachment recently announced by the Universal Crane Company, Cleveland, Ohio. For several years this company has been trying to effect better weight distribution on motor truck cranes, both on pavements and on soft ground. As a result, the eight-wheeled truck was developed, as shown in an accompanying illustration. Even the small wheel shown is a rubber-tired load carrier. Eighty per cent of the load is carried on the rear end and this is distributed equally to the six rear wheels. The box form arrangement of the six rear wheels gives a substantial ground bearing and increases the facility of the unit, which permits handling heavier loads. The unit is capable of a speed of 16 m.p.h.

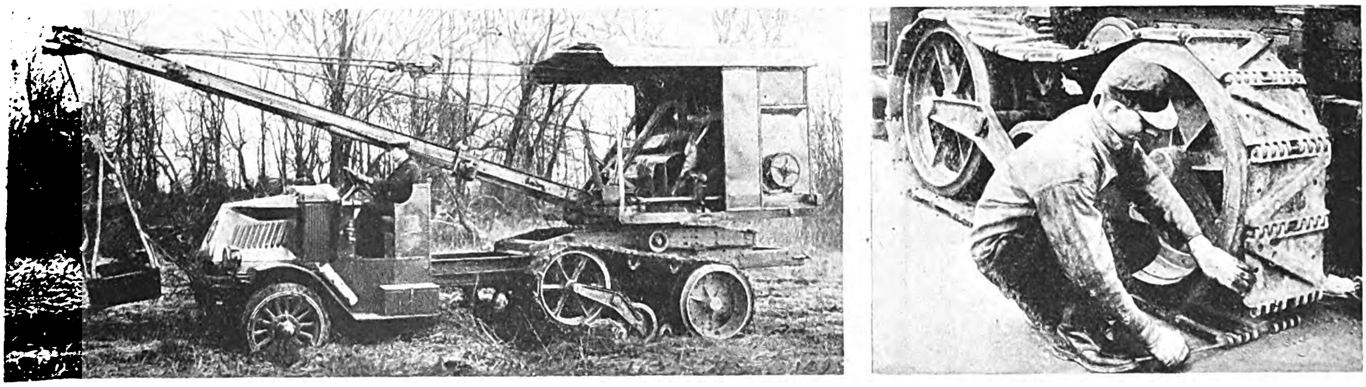
The crawler tread is carried just above the rear wheels, much in the same manner as fenders on an ordinary car. This crawler tread can be attached quickly and can be handled by one man at no extra cost. With the crawler tread in use, the unit has numerous advantages. It eliminates all danger on soft ground work and the necessity for planking. It provides for going directly to the job over banks and depressions. The speed of the unit as a crawler is 6 to 8 m.p.h. over soft ground.

In addition to the soft ground traveling ability of the unit greater over-all width and better distribution of weight are provided. The crawler tread travel is by means of lugs located on each alternate tread which fits between two spacer rollers on the rear driving wheels.

Heavy-Duty Ignition Unit

BUILT to withstand the severe service encountered in bus and truck operation, a new battery ignition unit is being placed on the market by the North East Electric Company, Rochester, N. Y. It is of the closed magnetic circuit type employing the jump spark. Mechanically the unit has been built to provide economical operation under adverse conditions. To this end all parts are made particularly strong and ball bearings are used to eliminate shaft wear.

The ignition coil is ironclad with closed magnetic circuit. It is waterproof, easily accessible and demountable. At high speed the high-tension impulses furnished by the battery ignition unit are reduced slightly in intensity, thus eliminating the rapid burning away of contact points. Contacts are made of tungsten and are protected from burning and arcing by high capacity condensers. Efficient engine performance is attained by automatic regulation at the spark. A supplementary manual control makes it possible to set the spark at the most desirable point under varying speeds and load conditions.


The motor truck crawler will travel from 6 to 8 m.p.h. on soft ground. One man can put the crawler tread on in five minutes

Association News & Discussions

U. S. Chamber of Commerce Frowns on Government Running Business

Private Ownership and Initiative Seen as Key to New and Successful Business Era—There Will Be Need for All Forms of Transportation

IN THE general sessions, committee meetings and section gatherings the keynote of the fifteenth annual meeting of the Chamber of Commerce of the United States at Washington, on May 3-5, was that a new and successful business era was dependent on the government withdrawing from all participation in business. It was the consensus of opinion that private ownership was fully able to operate an American merchant marine, inland waterways and the coal industry, and that by self-regulation American business is bringing about a condition which will result in fewer restrictions being imposed upon private enterprise and initiative through government regulations. Curbing the Mississippi also was given consideration.

TRADE BODIES PROMOTE UNDERSTANDING

Aside from the annual address of John W. O'Leary, president of the chamber, in which he traced the tremendous problems and territory that the chamber covered, also his belief in the slow but sure method of the chamber's referendum as a means of judging future business, the outstanding feature of the first general session, held on May 3, was the address of Haley Fiske, president of the Metropolitan Life Insurance Company, New York. Mr. Fiske's subject was "New Responsibilities of Business," which he divided into the relation of business men to each other, to employees, and to the public. In the first particular the speaker brought out very forcibly what some 60 trade associations were doing to bring about better understanding between business men. Some of the activities, he stated, were as follows: To solve the difficult problem of bringing about improvement in conditions to enable members, especially the weaker ones, to stay in business is what is characterized as "a deplorable competitive situation." To help small manufacturers by giving information they cannot afford to get. To obtain for common use legal opinion on trade difficulties. To put a stop to unfair competition involving graft in obtaining orders. To improve standards in order to meet and overcome cut-throat competition by a series of substitutes. To improve standards and qualities to comply with building ordinances and to strengthen and improve the laws. To establish ethical codes in competition. To send out inspectors to factories to make tests to improve qualities and raise standards. In the Coal Association to promote safety in mining. Co-operating with the Federal Board of Vocational Training to give training courses in localities and by literature to enable merchants to survive competition of chain stores. Co-operation with the Department of Commerce in standardization and eliminating duplication. In regard to the effect of standardization, the speaker said that in one industry $70,000 was saved on one item of the manufacturers, and that another industry had surveyed establishments covering $50,000,000 of business to fix proper ratios of assets, liabilities, income and expenses and had brought about vocational training and furnished help to the small concerns.

COMING MEETINGS

OF

Electric Railway and Allied Associations

May 18-19—Central Electric Traffic Association, meeting, Tuller Hotel, Detroit, Mich., 9 a.m.

May 31-June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 9-11—Midwest Electric Railway Association, annual meeting, St. Louis, Mo.

June 19-23—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.

June 20-24—American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.

June 20-24 — American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 29-July 1 — Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

June 30-July 1 — Tramways and Light Railways Association, annual meeting, Bath, England.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

As an example of how business is improving its relations with the public, Mr. Fiske pointed out that constituent associations are working for the protection of the buying public; that one industry educates the employees to produce good output and has actually got 70,000 of them to sign pledges to give the right kind of work and to replace inferior; many of these are foreign born who are thus trained in American ways. Several of the associations are fighting against misbranding and misstamping; in other words, against deception of the public as to material and quality. Some of them as associations guarantee the quality and evidence it by standard labels. One association certifies an important product where deception would be easy and non-compliance with legal requirement might be concealed. Another association standardizes grades and correctly marks them upon the product. Another enforces standards recognized throughout the world for measurement and inspection. Another association is engaged in eliminating trade abuses and unfair methods of competition. The speaker saw in advertisement also a trend toward better public relations.

EMPLOYEE RELATIONS IMPROVING

In regard to the relations toward employees, Mr. Fiske sees increasing signs of better understanding between employer and employees. "There is much evidence that business men are regarding the human element in labor relationship," continued the speaker. On the other hand, it was pointed out that encouraging signs had their origin in the fact that trade unions are recognizing that peace and prosperity can be promoted by understanding, by co-operation, by recognition of common interests in the industry. The other encouraging signs were personnel administration; co-operation in shop management; suggestion systems with prize awards, not in wages but in promotion of efficiency; improvement of apparatus and conditions under which it is used; medical and surgical attention; dental work; nursing; cafeteria service; milk supply; profit sharing; stock purchased by employees, helped by contributions of employers, mutual benefit associations with corporate assistance, etc. The speaker also gave his opinion of group life insurance, with all its ramifications, which he characterized as "one way to bring home to the employer his responsibility for the welfare of his employees as human beings and the economic quality involved in the brotherhood of man." In this particular Mr. Fiske took occasion to compliment the work of the American Federation of Labor in its recent step of forming a Union Life Insurance Company.

For the new business era, according to Mr. Fiske, both sides are calling for mutual understanding and both are expressing the duty of public service. The true ideal of the business man is to be of service to his country, to his associates in occupation, to the public, to those dependent on him.

Business Forecasts from Various Sections

THE general session on May 4 was given over to forecasts from the East, South, Midwest and West. Speaking for the East, John F. Lawrence of Boston, Mass., stated that pessimism is disappearing in New England. "Many of us feel," he said, "that the problems that New England faces today arise from the fact that New England, to a greater degree than any other section of the country, has reached the stage of industrial majority." Mr. Lawrence then traced the operation of what he described as the business clinic conducted by the New England Council. In his opinion, public knowledge is the best means for a cure. He also stated that the council, in addition to securing the help of educational institutions in the matter of research, was conducting exhaustive surveys through its own research committee. The council, it was stated, has made it popular for New England towns to look within themselves for the means of their advancement and improvement of their economic situation. We are newly awakened to the fresh opportunities before us and to the reward which will likely be ours, the speaker said in conclusion.

Speakers Are Optimistic

George H. Baldwin of Jacksonville, Fla., speaking for the South, predicted a bright future for that section of the country because of the availability for the first time of adequate capital and because of the departure from dependency on one product, and of the rapid establishment of new industries. He also saw great encouragement in the fact that there had been practically no labor troubles in that section of the country, attributable to the pure Anglo-Saxon blood of the white population. As far as Florida was concerned, he stated that the rapid deflation of real estate values is being met successfully by the many large and sound banks of the state and by other agencies. The development of the resources of the South, in the opinion of the speaker, is just as dependent as that of other sections of the country on the encouragement which the government gives capital to invest in business enterprise. A curtailment of the demands of those with large incomes for tax-free bonds must be brought about to see these funds again invested in productive enterprise rather than in tax-free bonds.

The agricultural situation in the Midwest was characterized by Silas Strawn, chairman of the board of Montgomery, Ward & Company, as being of unusual gravity, but he described the prosperity prevailing in industrial centers to be unprecedented. As a whole, Mr. Strawn considered the situation as favorable.

Harry Chandler of the Times-Mirror Company, Los Angeles, gave a glowing account of the progress of business in the West. "Forces beyond our power to control or to direct," said Mr. Chandler, "are setting the stage on the shores of the Pacific of a new theater of world events. The century westward march of Aryan achievement has ushered in, what for want of a better term, may be called the Pacific Era. The front door of America will ultimately be on the Pacific, whose eastern and western shores are formed by lands just coming into the world's spotlight in its upward sweep from East to West. In all, while the progress and development of the West has not been without its disappointments and reverses, it has been generally one of steady, consistent fulfillment. We have suffered from few of the spasms of speculative hysteria known as booms, and in consequence we have not had to recover from feeling the resulting sloughs of depression. We have perhaps learned little that the East did not already know and have done nothing that it had not already done. If we have shown any virtue, it is that we have not wasted our time and opportunity in reckless experiments. Our problems line up not so much in what we have done but in what we shall do. We have learned to walk with considerable assurance, but we have no deep-worn paths of tradition to determine the direction we should take. We are dealing with the future, not the past." Mr. Chandler then pointed out that the southern portion of the Pacific seaboard, like every section which experiences an unusually rapid growth of population, has been hard put to balance its census figures with its commensurate rate of industrial growth. Parts of this area, he pointed out, have established new world records for numerical increase and population has been obtained which would be economically impossible of maintenance save for an exceptionally favorable background of natural resources and industrial potentialities.

Group Sections Centers of Interest

VYING in interest with the speakers at the general sessions were those who addressed the group section and who later interpreted the group opinions at the general session on May 5, their topic being "What's Ahead for Business."

"There should be teamwork between agriculture and business," said White B. Heard of Phoenix, Ariz., speaking for the agricultural section. "It is the plain duty of organized business to give assistance in stabilizing agriculture. Farmers are not asking for dough, but equal opportunities and self-interest demand that business men see to this."

"There are 925,000,000 acres devoted to farms," the speaker said, "and 24 per cent of our population derives its living from agriculture." This, it was pointed out, represented an investment of $64,000,000,000. On the other hand, Mr. Heard stated that in 1925-1926 outside capital invested in agriculture represented only 3½ per cent, and that for the same period the average return to the farmer was $648 per annum. Reduction in production is not practical, as the climatic conditions make this impossible; agriculture has not recovered from the depopulation which occurred after the war; the farmer's dollar buys less today, were some of the speaker's observations. On the other hand, he saw an encouraging outlook in the fact that the pure seed movement was growing, that crop rotation was being practised and that several products of the farm had increased in value.

Skyscrapers Defended and Condemned

In the meeting of the civic development group Harvey Wiley Corbett of New York declared that the skyscraper is not a disease but a solution of business perplexities. He pointed out that it may relieve street congestion and enable business men to conduct operations in limited area. The business day is growing shorter and the volume of business done larger; the skyscrapers now are as essential to efficiency as is the telephone or the automobile. Reduced building heights, he said, to seven or eight stories in the 42d Street area of New York City would require 1½ square miles of new territory and would so lengthen the lines of communication as to promote rather than decrease congestion. It was his opinion that vertical transportation is easier to handle than horizontal transportation. In opposition to Mr. Corbett were the views of Major Henry H. Curran, also of New York, who held that the skyscraper makes for congestion, particularly during rush hours, and that failure to control height spoils the appearance of cities. Because of skyscrapers, Major Curran said, New York is faced with the necessity of putting all of its funds into new subway transportation facilities instead of building sewers, parks and playgrounds.

Reporting to the general session of May 5 on this subject Charles W. Lonsdale, president of the Simonds-Shields-Lonsdale Grain Company, Kansas City, Mo., after reviewing the general discussion pointed out that urban population is steadily growing and that in 60 years, out of a probable population of 150,000,000 people, 67 per cent would live in cities and small urban communities. He thought it encouraging that in recent years the city populations had shown a lower death rate than that of the country. He reminded the chamber of the $1,000 prize which has been offered by the National Real Estate Association for the best opinion on what is the economic height of buildings.

Forecasting what was ahead in the way of problems for those interested in domestic distribution, Robert I. Ellis stated that 60 per cent of the chambers of commerce in the United States were interested in this most vital subject. Distribution, he said, was more intricate in this country than in any other country of the world due to our enormous territory and the high standards of living. He said that business men are primarily interested in what is the status of the chain store and independent store and as to the probability of the manufacturer dealing directly with the retailer and ignoring the wholesaler. Business must have better relations, it was pointed out. Cancellation of orders after the discount had expired is to be frowned upon. Business, Mr. Ellis continued, is facing a relaxation on the part of the consumer and speculative buying was not justified. In his opinion all signs pointed to normal conditions, however. At the group session on domestic distribution on May 4 it was revealed that the Department of Commerce would take a census of distribution in eleven cities; this census is to follow the lines of that recently taken in Baltimore. The gathering of distribution figures, it was explained, is an experiment. If final results are as valuable as they now seem a national survey will be undertaken.

FEAR OF SHERMAN ACT REMOVED

When leading the discussion in the group meeting Judge Edwin B. Parker, umpire of the Mixed Claims Commission, United States and Germany, predicted that now the fear of the Sherman act had been removed from fact-finding there would be little place for government regulations, as business could regulate itself. While business may not act in concert to fix prices or to limit competition unreasonably or to restrict production, Judge Parker declared that it is lawful to assemble facts and distribute them stripped of opinion.

A discussion in the meeting of the finance group, Felix M. McWhirter of Indianapolis, reported, placed emphasis on sound management and upon the necessity for self-regulation of banks. In some sections of the country, said Mr. McWhirter, there was a general impression that there were too many banks and too few bankers. He pointed out that the country could expect only one more reduction in federal taxes, and that these taxes should balance governmental expenses and not show any surplus. He thought it of the utmost importance that a broad study be made of the financial conditions and operation of the Federal Reserve System and that sound conclusions be arrived at in regard to the system. He also pointed out that it is necessary for the financial interests of the country to determine what was of value in an emergency and what was necessary in normal conditions of activity. As far as foreign finance is concerned, the speaker voiced the opinion that Europe must pay and that the money derived from this source should not be used for tax reduction or for governmental expenses.

Speaking for the foreign commerce group, Henry Sharpe, president Brown & Sharpe Manufacturing Company, Providence, R. I., was most enthusiastic as to the outlook of our foreign commerce, particularly so as, coincident with the meeting of the chamber, the Third Pan-American Commercial Conference was being held in Washington. Resorting to figures, Mr. Sharpe revealed that $4,500,000,000 of the United States capital was invested in Latin America; that the trade in 1926 was $835,000,000 in exports and that purchases from the countries south of us amounted to $1,000,000,000, this combined business representing one-fifth of our total foreign commerce. The speaker saw in the Hoch act, recently passed by Congress, which put the Department of Commerce on a par with that of the Department of State, a tremendous factor in improving foreign commerce. He also considered the erection of consular buildings in various countries as having been a great aid in this particular. The American people must show an increasing interest in foreign commerce, and at all times they must maintain an international mind, Mr. Sharpe cautioned. New foreign competition had arisen, he admitted, due to the discovery of metallic producing sections in Europe.

Substituting for H. A. Smith, president of the National Fire Insurance Company of Hartford, Conn., and chairman of the insurance group, James F. Kemble, vice-president of the chamber's insurance advisory committee, reported the insurance group as approaching the coming year with confidence and that life insurance protection now totaled $85,000,000 with fire insurance coverage amounting to $200,000,000. He also reported that nine years extension of longevity was the result of the educational campaigns carried on by insurance companies.

HIGH WAGES RESULT FROM PROSPERITY

Led by A. J. Brosseau, president of Mack Trucks, Inc., of New York, the manufacturing section heard several interesting speakers, the first H. R. Rice, assistant to the president of General Motors Company. In developing his subject, "Wages in relation to Cost," Mr. Rice said: "Our own people have been writing and talking as to the reasons for increased business in the face of declining prices and also without declining wages, either money or real. Many reasons have been given, among them: Small individual profit and quick returns; rapid turnover; plant rejuvenation and the scrapping of good machinery worth many dollars when there was offered better machinery of greater efficiency; absence of trade jealousies or trade secrets; avoidance of waste and attention to time saving; general interest in welfare; prevalence of research; incentive to group and individual exertion; cooperation of labor; absence of geographical barriers; mass production; prohibition, installment selling; lack of class distinction, and every man being a capitalist through stock ownership, etc.

"High wages are more a result of prosperity than prosperity is a result of high wages," continued Mr. Rice. "Prosperity is a result of high average production per man. However, that high production may be achieved, so that the order is, first, high production; second, prosperity and high wages." In the speaker's opinion "the low wage earner from abroad cannot increase his own ability merely by a trip across the ocean. His strength is not multiplied by the short sea voyage. We are not as hard muscled as our grandparents, but the difference in our economic status is that we are able to produce more, not by an increase of muscle, but by brain power, evidenced in equipment, wages and organization. That is the chief asset to our prosperity and our high wages. High wages are a result of high production with low unit cost and cannot themselves be the cause of prosperity. It is for us to make sure," Mr. Rice said in conclusion, "that at this time, when we have been enjoying the period of greatest prosperity in our history, we shall not lose sight of the fact that this prosperity has been caused by and is dependent upon the great production of this nation; in which worker, foreman, manager, organizer and every kind of interest may alike take pride."

Intense enthusiasm was aroused by the next speaker, Arthur T. Morey, general manager of the Commonwealth Steel Company, whose speech is carried elsewhere in this issue of the JOURNAL. Basing his remarks upon the premise that industrial relations have much to do with human happiness, Mr. Morey gave a thorough and absorbing description of the welfare work and general industrial relations program carried out by the Commonwealth Steel Company.

In summing up to the last general session of the chamber the work of the manufacturers' section, Chairman Brosseau said that it was the consensus of opinion of the group that the short week and shorter wages would cause no controversy provided the unit cost did not increase. He next touched upon the increase in the wages of rail workers, pointing out that it was problematical to what extent this would affect industry, the outcome being largely dependent upon whether the rail worker, in consideration of a higher wage, was willing to do more work. Mr. Brosseau announced that his group had prepared a comprehensive plan for 1927 which would include the study of trends, overproduction, mass production, cost accounting, foreign relations, foreman training and industrial production in prisons.

CONGRESS' DISREGARD OF WATER-POWER ACT DEPLORED

At the general session on May 5 Milton Marcus, chairman of the national resources production group, made a notable talk in which he deplored the disposition on the part of Congress to disregard the water power act in dealing with large projects such as those at Muscle Shoals and at Boulder Canyon, also the tendency to interest the government in the production and distribution of hydro-electric power. He pointed out that private initiative and energy have brought us to our present high state in the development of that important industry. Referring to the coal industry, he declared that the experience of recent years has shown the public that, if let alone, it can be depended upon to furnish coal in ample quantity at fair prices. He held that the industry has justified the confidence voted it by the chamber last year when it reiterated its opposition to government regulation or control. Mr. Marcus also urged the enactment of legislation which will make possible the business of growing crops of trees. He stated that three states have already enacted constitutional amendments looking toward the conservation of the forests and that 36 states are giving study to the situation. It was gratifying, he pointed out, that of all the constitutional amendments offered at the last meeting of the Legislature of Wisconsin only the tree conservation amendment was finally passed.

Needs for All Forms of Transportation Predicted

"NEW Trends in Transportation," a scheduled address by R. E. M. Cowie, president of the American Railway Express Company, was, owing to his illness, divided among W. L. Claus, who gave a résumé of the recent developments of waterways; A. J. Brosseau, who discussed the trend of bus and truck transportation, and George D. Ogden, traffic manager of the Pennsylvania Railroad, who presented the rail situation.

Prior to the speeches by these gentlemen several resolutions were introduced. Prominent among them was one dealing with commercial aeronautics, in which it was pointed out that charted airways had progressed and that the American Railway Express Company had contracted for the handling of express through the air. It was urged that the chambers of commerce throughout the country help sell the commercial air routes to the public and that wide patronage was the ultimate solution.

Speaking on the waterways situation, W. L. Claus gave a graphic description of the progress of water transportation made along the Ohio River during the past few years. He stated that the last dam was expected to be completed in 1929, which would afford transportation from Pittsburgh to New Orleans, and that definite recommendations for improving navigation on the Mississippi above St. Louis have been made. In regard to work on the Allegheny River the speaker revealed that locks and dams 4 and 5 are expected to be completed by the summer; lock 6 is scheduled for service next year. He also reported that 45 miles of the Warrior River Canal was now navigable. To add impetus to water transportation Mr. Claus urged that the government relinquish its operations as soon as practical. In substantiation of his contention that the use of inland waterways was on the increase, he gave some astounding figures on the ton-miles of freight handled by the Monongahela River at Pittsburgh.

BUS AND TRUCK USEFUL FOR SHORT HAULS

A. J. Brosseau, who followed Mr. Claus, held that the field of the railroad is the long haul. Trucks, he declared, are being confined more and more to the short haul, while the bus, successor to the lowly jitney, and over-exploited in relation to railroad and civic transportation competition, was held to occupy a definite but not thoroughly understood place in the transportation system. Confronted by a challenge made by the two previous speakers as to the railroad's position toward the truck, bus and inland waterways, Mr. Ogden laid down the very broad principle that what is good for the community is good for the railroad and what is not good for the railroad is not good for business. He also voiced the opinion that as the years went on there would be a demand for all sorts of transportation; he predicted that it would be a long time before transportation facilities would be entirely adequate.

One of the outstanding features of the transportation group session was the fearless attack on a government-owned merchant marine, made by Philip H. Gadsden of the United Gas Improvement Company of Philadelphia. Mr. Gadsden stated that he was against ship subsidy, but expressed the opinion that private business will find a way to support an American merchant marine. Chairman O'Connor of the Shipping Board, in reply, stated that the board favored a privately owned merchant marine if that be possible, but that it is first for a merchant marine. He said that the board is willing to sell any route that operates if a guarantee of five years of operation is given. The prices which will be asked for the ships will not be allowed to be an obstacle to such a deal, he declared. In view of the disclaimer of Chairman O'Connor that the board contemplates investing public funds in new construction and in view of the policy of disposing of all ships and trade rights to private enterprises at any sacrifice, if reasonable assurance of continued service is given, the transportation group decided to take no action in the matter other than to impress the board to use all energy in its power to place shipping in private operation.

Reporting in general for the deliberations of the transportation and communication sections, Mr. Brosseau predicted a better era of relations between the railroads and the public. More than $850,000,000 will be needed by the railroads annually, he stated. The future of railroad expansion calls for sound financing of railroad securities and returns should allow financing through stock issue.

RESOLUTIONS ADOPTED

Of the many resolutions adopted at the chamber's final session, those of particular interest to the electric railway field were on the subjects of taxation, federal, state and local; tax administration; trade relations; revision of postal rates; street and highway safety, and highway bridges. On federal taxation the following statement is pertinent:

> Both sound fiscal policy and equity to taxpayers require a reduction in the tax upon corporations. It is unsound for the federal government to rely upon one source for so large a part of its revenue as it is now obtaining from the corporation income tax. The result is that the government's revenues are necessarily affected by changes in business conditions. The present rates of federal tax upon corporate income are so high that they are inequitable in comparison with the rates upon individuals, unfair as an excessive indirect levy upon the great body of stockholders, and essentially unjust to business transacted in the corporate form, because of the weight of total taxes now accepted by federal, state and local governments.

In the matter of trade relations, the chamber urged "the elimination of all wasteful practices and trade abuses by the formation in each trade of a joint trade relations committee composed of representatives of every branch of trade. Such committees should seek out and define trade abuses and co-operate with the Federal Trade Commission in their elimination."

Regarding postal rates, very definite recommendation were made that they be reduced to a reasonable basis. The resolution reads in part:

> There has been a more or less generally accepted idea that the receipts from the postal service should fully cover all of the costs of that service. This is contrary to accepted business principles and overlooks the fact that efficiency and adequacy of the service should be the first consideration. It also overlooks the fact that Congress, in its wisdom, has seen fit to use the postal service for carrying out governmental policies by the granting and extending of "free" or "less-than-cost" services.

The chamber was equally positive in its position with respect to street and highway safety, declaring that "unceasing vigor should be applied to remedy the situation." The resolution indorsed the principles set forth by the National Conference on Street and Highway Safety and urged active support of its program.

The construction of highway bridges, in the opinion of the chamber, causes financial problems, upon which the following test of a resolution has bearing:

> Whenever after careful survey it is found to be necessary to meet these problems by permitting the erection of toll bridges, authority to build and operate such bridges should be granted only upon definite conditions. These conditions should include a requirement that construction and operation will be under the control of appropriate public agencies with a duty to see that the public interest is in all ways safeguarded and a provision that the right to collect tolls shall cease after there has been opportunity to obtain a reasonable return.

At a meeting of the board of directors today Lewis E. Pierson of New York City was elected president of the Chamber of Commerce of the United States and Edwin B. Parker of Houston, Tex., and Washington, D. C., was named to fill a newly created position of chairman of the board of directors.

Eastern Division—A. J. Brosseau, New York, to succeed Mr. Pierson.

Southern Division—Robert R. Ellis, Memphis, re-elected.

Northern Central Division—William M. Butterworth, Moline, Ill., re-elected.

Western Division—Paul Shoup, San Francisco, re-elected.

Human Treatment of Worker Will Solve Problems of New Business Era

PLACING the whole success of the new business era upon an appreciation of the worker's right to life, liberty and the pursuit of happiness, Arthur T. Morey, general manager Commonwealth Steel Company, St. Louis, made the keynote address at the manufacturing luncheon session of the Chamber of Commerce in Washington on May 3. As far as his company was concerned, declared the speaker, granting workers such constitutional rights had resulted in higher production and lower unit cost.

"Industrial relations have much to do with human happiness," Mr. Morey said. "When the workers of the world receive justice and a due measure of worldly comforts and opportunities one of the greatest causes of human friction and unhappiness is removed. Life, liberty and the pursuit of happiness is interpreted by most people as the right to make, and the blessings of having, a good living. By industrial relations, I presume we mean the relation between labor and management, using the word management in preference to capital which it represents, management being more direct contact. Of old, industrial relations have been dictated by supposed necessity, by economic force, or even by fear and perhaps sometimes by greed, but the better latter-day concept of industrial relations is a condition between labor and management based on equity and good will, American management having come to see that the nearer it can treat men as men, as Americans by Christian standards, can it gain that co-operation, respect and good will of employees that is essential to obtain the best productive effort. It is simply the operation of the law of cause and effect. It seems strange that men ever thought that good results could be got without having set in motion good causes.

WELL-PAID WORKERS CREATE MARKETS

"That sort of good will is Americanizing America to the workers and the workers are extremely important—in fact, the most important part of any community. It is extremely desirable for every reason that our great class of wage earners be self-respecting, well clothed, well housed, well educated and well informed so that they may be intelligent citizens and voters and also gain a greater measure of culture. Well-paid workers create a fine market, and steady work and steady pay we may find will mend a part of our broken prosperity circle and aid in giving us steady good business all the time instead of its ups and downs. By well paid I do not mean paid an existing wage, but a living, saving, cultural wage that makes of a man an upstanding, self-respecting, self-reliant American. Nor is it just money enough. A workman spends a good part of his waking hours in the shop. His job is a big thing to him. His company contacts should be upbuilding and exemplary in evidencing to him justice, fair and open character and friendliness. His job and his environment should be character building."

In developing his subject from this premise, Mr. Morey cited the industrial relations program now operating in the plant of the Commonwealth Steel Company. Among other things he told of how his company has instituted high school courses for the apprentice workmen, with the result that the students were able to take the regular high school diplomas in the public schools of his city. Next he sketched the employee-managed service department and commissary, and explained the insurance plan which was set up several years ago when the company hired an insurance expert to work out with the men a sliding scale of protection that gave each employee insurance policies from $500 to $2,000 and upward.

He next told of the Americanization plan by which "Hungry Hollow," one of the toughest sections of the city, was developed into a civic center with a splendid community building, built by the workers upon land donated by the Commonwealth Steel Company. This work, he said, included new sewers, schools, sewing circles for women, boy and girl scout activities, etc. He also sketched briefly the work of the two fellowship clubs, one for each race; the Home Building fund, which loaned money at 5 per cent without commission, and the fellowship fund, employed in emergencies. In the case of the former the speaker stated that his company had never had a loss, and that two-tenths of 1 per cent loss was the record in the fellowship fund, which had reached over $56,000 in loans. Next the bonus distribution system was explained; it being the attitude of the president, said Mr. Morey, to determine how much and not how little the company's profits should be shared with its employees.

In the realm of safety, the speaker was convinced that the movement as a whole was the opening wedge for better industrial relations in this country. As an example of what safety had done in his plant, he cited the case of the steam pipe gang that had installed 42 miles of piping in four years without a time-loss accident, and of a new pattern shop which had gone two years without a time-loss accident. Continuing, Mr. Morey said:

"It has been our policy to figure about so much per ton on our costs to support our program of safety and fellowship activities. We believe that instead of these being a cost to us, these expenditures have been an efficiency measure and that our costs are lower than they would otherwise be. The cost is not as great as one might think—it is often a matter of willingness to serve and is not a cost at all. Our home loans, fellowship loans, safety work are not costs, for they support themselves. Some of the other activities are practically no cost. I think the better question would be, 'Can we afford not to do these things?' I do not believe we could accomplish the fine product of our company without the good will and hearty co-operation of our men.

"Some concern has been expressed as to whether or not inventions and mechanical improvements will disturb the balance and will cause an excess of labor and unemployment.

"We speak of Newton's law, of the law of supply and demand, etc. I believe we can announce another law. That the consuming power of the world is equal to its creative power. It is proved so already here in America. The sewing machine at first caused riots through great fear that honest women would be thrown out of needlework; it is now recognized as perhaps the greatest single blessing for practical human needs. The early harvester machine was received with attempted destruction; without it today the people could not be fed at any reasonable price. And, too, the trend of modern inventions has been to raise the mentality of the people. The intelligence required under changed conditions is higher and higher and this calls for more and more in our markets. It takes more intelligence and a higher environment to be a motorman or chauffeur than it did to drive a horse car or old-time hack. I do not think we need be disturbed by the displacing of men by inventions and improvements, for I take it on faith that it is a law that no two truthful conditions can conflict.

"I think the thing that need concern us the most is the fellow who tediously and monotonously drives bolt No. 57 all day long instead of being a craftsman with love and interest in his work. Here there must somehow come compensation and adjustments. The eight-hour day helps this situation by giving leisure to turn the mind and interest to constructive things. We may develop conditions further so as to devise a machine to drive bolt No. 57 and do it so as to require intelligent supervision instead of drudgery.

"H. G. Wells says that the common people are happier than ever before in the history of mankind. There seems to be an eternal law of justice and adjustment that assimilates progress.

GOLDEN RULE APPLICABLE IN INDUSTRY

"The world is in flux. The old traditions are slipping. Old reverences are loosening. Long dormant races of overwhelming numbers are awakening. The world, particularly the East, is doubting and sometimes despising the "Western Devils" civilization because of some unfortunate things they have witnessed or experienced. What is going to happen as the world gets smaller and smaller and these great foreign masses of people get aroused and in motion? What is going to happen unless a common principle of conduct for all men is found that is easily explained and easily understood and can influence and govern all peoples?

"We are finding in industrial relations the principle of the Golden Rule is the only rule in human affairs that seems to work. We are going to find that the principle in industrial relations is the only thing that will interpret America to the world. The unrest of the world is among the workers and the peasants. If in America we have a contented and constructive wage earning class—*that* will sell America to the world quicker than any other thing.

The News of the Industry

Expert Suggests M. O.

City of Los Angeles Recommended to Buy Local Lines by Expert Delos F. Wilcox

Dr. Delos F. Wilcox, traction expert, in a preliminary report on local transportation policy filed with City Attorney Jess E. Stephens and the City Council, recommends that the city buy the Los Angeles Railway, Los Angeles, Cal. Doctor Wilcox was recently employed to aid the city in opposing increased street car fares.

The city's consultant emphasizes that he feels no hesitation in recommending that the City Council "take the necessary steps to authorize official inquiries and the preparation of a form of contract to effectuate the plan above outlined for the acquisition of the yellow lines."

With respect to the city's financial ability to take over the car lines Doctor Wilcox is advised that there is plenty of margin within the legal debt limit for this purpose, but that the city deems it necessary to conserve its available credit for still greater enterprises in the field of water supply and light and power development.

He further says that he is advised that Mr. Huntington, having sole ownership and control of the lines, has long entertained the hope that he would be able to sell them to the city at a conservative price and take his pay from the earnings. According to him Mr. Huntington would be willing to take in payment for the system city bonds bearing a low interest rate.

Doctor Wilcox said:

> In street railway operation, where the great masses of the citizens come in daily contact with the service and pay for it as they ride, the public has a better chance than in any other utility to insist upon good service and efficient operation.
>
> The good features of the present management ought by all means to be preserved, in case the city should decide to take over the car lines, and the plans adopted should be such as to insure better things instead of worse under public management.

Doctor Wilcox expresses the opinion that the purchase price of the Los Angeles Railway, including its bus lines, would be less than $30,000,000 at the present time.

Discussing the pending rate case, the preliminary report expresses the opinion that a valuation of $40,000,000 or more would be much higher than the "just and true value of the property for rate making purposes."

On the advantages of public ownership, Doctor Wilcox in part says:

> (a) The city would be free from the jurisdiction of the Railroad Commission and could adopt such policies with respect to service and rates as it saw fit, with the unquestioned right to pay for the property out of earnings if it was financially able to do so.
>
> (b) The city would have unrestricted control of extension and betterments, including the expansion of bus service.
>
> (c) The capital investments as a basis for rate making would be stabilized at the actual cost of the property of the Los Angeles Railway Corporation to the city, free from the burden of increasing land values and reproduction costs.
>
> (d) The cost of new capital would be limited to the rates of interest paid on city bonds instead of the rate of return allowed by the Railroad Commission on private investments.
>
> (e) The city would be free, under the present law, from the payment of gross receipts and income taxes on street railway operations.
>
> (f) The city would be able to co-ordinate the service now rendered by different agencies, and establish uniform and non-discriminatory rates. If the city acquired only the lines of the Los Angeles Railway Corporation it would be in a position to extend its lines and service so as practically to compel the co-operation of the Pacific Electric Railway and thus secure most of the benefits of unification, even if it did not own the red lines.

New Chicago Official Acts

Mayor's Advocacy of Unified Chicago Transit Results in Preparation of Bills for Enabling Legislation—Rush Subway Construction Bills—Opinions Differ on City's Right

A LONG-ANTICIPATED move on the part of Mayor William Hale Thompson and the new city administration in Chicago for the settlement of the traction problem was made on May 6, when work was begun on the drafting of bills by the city's legal department. Detailed contents of the bills have not been officially disclosed. It is expected, however, that the measures will be presented to the Legislature at Springfield some time within the next week or ten days in an effort to obtain legislation which will permit the consolidation of the different local transportation agencies, the granting of a terminable permit, the adoption of home rule and the construction of subways by means of special assessments, before adjournment time six weeks hence. The home rule feature, if granted, will be a concession by the companies, which have been seeking terminable permit legislation.

Mayor and Utility Representatives in Private Conference

Both Mayor Thompson and traction officials have agreed that such terms should form the basis of any new contract between the city and the companies. This decision resulted in the bills now being drafted. It was reached after a succession of private consultations in the last ten days between the Mayor and Samuel Insull, president of the Chicago Rapid Transit Company; Albert J. Harris, chairman of one of the Surface Lines bondholders' protective committees; John Hertz, chairman of the Chicago Motor Coach Company, and other local transportation officials and bankers. Alderman J. B. McDonough, chairman of the local transportation committee, has assured the Mayor that his committee will be ready to pass upon the measures within 24 hours after they are presented to the City Council for approval.

If the needed legislation is obtained, expert observers have pointed out, the twenty-year Surface Lines franchise plan of the Frederick J. Lisman interests and the exclusive city-wide bus service proposal of the Chicago Motor Coach Company, both of which are now pending before the local transportation committee, will probably be dropped from consideration.

One of the effects of the introduction of these bills into the Legislature will be to hasten the presentation of the terminable permit bill sponsored by Senator Richard J. Barr of Joliet. This measure, known as the "Barr" bill, has been the cause of an exhaustive investigation in recent months of the terminable permit in practice by a legislative sub-committee.

Discussion of subway construction as a problem independent of the railway franchise difficulties has been renewed by the city officials. Although it is agreed that both should be dealt with concurrently, members of the City Council now favor the speeding up of plans for a subway system to be built by special assessment regardless of the outcome of negotiations for general settlement of the traction problem.

In order to insure construction of subways adequate to the city's needs, Corporation Counsel Samuel Ettelson is now preparing, together with the general traction measures, a bill which would grant the city broad powers in this matter and would cover all contingencies that might arise in connection with subway construction.

Because opinion as to whether the city has the right under present statutes to build subways by means of special assessments differs among lawyers, Mayor Thompson believes it advisable to seek additional legislation to cover the points raised. Lawyers for the city contend that the present laws spreading special assessments for public improvements are adequate to permit the building of subways, while other attorneys hold that enabling legislation is required. The bill now being prepared by the corporation counsel would grant the city the right to build subways by this method, to use the accumulated traction fund of $50,000,000, would give the city the power of condemnation for the building of stations and switchyards and would also grant authority to the city to lease the subways when completed to whatever uses and whatever tenants may be selected.

No Change in Capital Traction Wages

A decision was rendered on May 11 in the wage issue affecting the employees of the Capital Traction Company, Washington, D. C. The arbitration board denied the application of the employees for an increase in wages and the company's application for a decrease in trainmen's wages. Arbitration sessions began on April 9 and after several interruptions were concluded on May 2.

The principal reason advanced by the board for refusing the men's request was the financial inability of the company to give it. Recommendations were made for relief for the company in the form of one-man car operation. The report was signed by Frederick A. Delano, the third arbitrator, and by Stanton Peelle, the company's representative on the board. Arthur E. Holder, representing the men, dissented.

In accordance with the terms of the three-year contract with the organized employees executed in March, 1926, transportation men of the Capital Traction Company prior to Feb. 28 requested a flat rate of 65 cents an hour for conductors, motormen and bus operators, which was 7 cents above the maximum rate, and an increase of 7 cents an hour for all other employees. Following this the company requested a decrease of 2 cents an hour for conductors, motormen and bus operators, with no change in rate for other employees.

Handling of Tacoma's Transportation Problem Criticised

In a report to the City Council of Tacoma, Wash., Kenneth G. Harlan, city statistical engineer, charges that only the inclusion of improper operating charges and computation of returns upon unwarranted valuations prevented the Tacoma Railway & Power Company and its allied company, the Pacific Traction Company, from showing a reasonable rate of return under any of the railway fare schedules which have been in effect during the life of the company. The report is voluminous. Criticism is directed "against improper methods that have been employed to obtain unjust rates and exorbitant valuations."

Approval of the report, and decision to stand squarely behind Engineer Harlan in negotiations for a permanent settlement of the Tacoma transportation problem, was voted unanimously by the City Council in its first session. The fact that the report is almost revolutionary in its character from the standpoint of corporate finance and that it will strongly be attacked was realized by the commissioners.

R. T. Sullivan, manager of the property, said in a letter to all employees:

> 1. Mr. Harlan is obviously strongly influenced by the socialistic doctrine of municipal ownership.
>
> 2. If the newspaper accounts are accurate, one of two conclusions is inevitable. Either Mr. Harlan's interpretation of the financial facts of the company is right, and all the many state officials who have examined our records, the entire committee of 25 appointed during Mayor Riddell's régime and our own men, such as Mr. Wilmot, Mr. Rounds, etc., are wrong, or the many state officials, the committee of 25 and our own men are right, and Mr. Harlan is wrong.
>
> Mr. Harlan was hired as an expert by the city and we have not yet checked his qualifications, having assumed that he is qualified as an expert. We do not know what his previous record has been or is.
>
> It may be necessary to ask the city to call in an expert of recognized standing to interpret Mr. Harlan's report.

Hearing on Houston Fare Awaited

The question of increased fares on the lines of the Houston Electric Company, Houston, Tex., is expected to come up before the City Council in a short time. Members of the city administration have been working on the company's petition, investigating rates in other cities, estimating incomes under various rates and gathering data since the Houston Company submitted its appeal for higher fares early this year. As outlined in the ELECTRIC RAILWAY JOURNAL, issue of March 12, 1927, page 464, the company proposes a fare adjustment based on a sliding scale which will permit regular patrons the same fare as heretofore or probably less and the occasional rider to pay a fare of 10 cents. The company claims improvements which will cost $1,000,000 will be necessary in 1927.

Free Rides in Portland

The Lipman-Wolfe department store, Portland, Ore., on May 2 chartered all the cars of the Portland Electric Power Company between 9 and 10 o'clock in the morning to carry passengers into the city, in celebration of its 77th anniversary in business. Conductors announced to passengers who proffered fare that this was the private car of the Lipman-Wolfe Company. This department store has a contract with the Portland Company to carry its ads on the front of the street cars announcing sales and has used this privilege exclusively for many months.

Jaywalker Scored in Chicago

The pedestrian who ignores traffic signals and rushes across street intersections without their protection has less than one chance in three of reaching the other curb without wasting more time than he saves. This conclusion is contained in the survey report submitted by the Albert Russel Erskine Bureau for Street Traffic Research, Chicago. Beside an investigation into walking habits, other studies made in Chicago's "loop" business district developed that the jaywalker seriously retards the speed and volume of traffic movement. To reduce the congestion and waste of time occasioned by this one phase of the traffic problem the report of the survey recommends that jaywalking be prohibited, with suitable penalties for violation. In order to reduce the inconvenience to a minimum and to introduce a degree of flexibility into the rule, the report also proposes that crossings be placed near the middle of blocks in districts where the distance between intersections exceeds 400 ft., and that in such places pedestrians be permitted to cross with a right-of-way over vehicular traffic.

Public Inquiry Next Step in New York

Negotiations between the New York Transit Commission and the traction corporations for amicable readjustment of the dual subway contracts and unification through agreement have failed. Announcement to this effect was made on May 11 by Samuel Untermyer, special counsel for the Transit Commission. As a result hearings designed to bring all the facts of the situation before the public and to enable the Transit Commission to devise a plan based substantially on the recapture by the city of some important trunk subway lines are to begin very soon.

Mr. Untermyer's statement declared that the Interborough wanted the city to take over the Manhattan elevated lines, which it holds on a lease, but which do not pay, and that the B.-M. T. expressed its willingness to dispose of its surface lines to the municipality but wanted a guarantee of its earnings in perpetuity.

Mr. Untermyer intimated that the companies were unreasonable in their demands. Recapture seemed to be the only answer, he said, if the companies remained in their present mood. He indicated a firm belief that the problem could be solved without increasing the 5-cent fare.

Mitten Bank and Brotherhood Bank Merged in Philadelphia

Mitten Men & Management Bank & Trust Company has merged with the Brotherhood of Locomotive Engineers Title & Trust Company. The two banks will continue to occupy their respective quarters at Market and West City Hall Square and the Lincoln Building in Philadelphia, Pa. Approval of stockholders of Mitten Bank will be asked for an increase in the capital stock of the bank from $3,000,000 to $3,500,000, to care for the present merger.

The letter to stockholders, which included a call to a special meeting for final action on May 28, reads in part as follows:

> In accordance with the terms of the agreement, each stockholder of the Brotherhood of Locomotive Engineers Title & Trust Company will at his option have the right to exchange his stock for stock of the Mitten Men & Management Bank & Trust Company on the basis of two shares of stock of the Brotherhood of Locomotive Engineers Title & Trust Company for one share of stock of the Mitten Men & Management Bank & Trust Company (the last sale of which was at $150 a share), or to receive for each share of his stock $45 in cash. This option must be exercised by writing delivered to Mitten Men & Management Bank & Trust Company, within 30 days after approval of the said consolidation agreement by the stockholders of the Brotherhood Company.
>
> In accepting this proposal, the board of directors has taken into consideration the attitude of helpfulness and co-operation shown by the Mitten Bank toward the working people of this city. The bank has more than kept its promises to the stockholders and depositors of the defunct Producers & Consumers labor bank whom it saved from loss. In the services it has provided, it has made special provision for people of moderate means, and has proved its desire to advance the cause of labor becoming capital. In all of these policies and features, Mitten Bank closely parallels the Brotherhood Bank and the proposed merger will therefore not only maintain for our stockholders and depositors the same advantages which they have heretofore enjoyed but will provide greater resources on which to build for the future.

Legislation for Boston "L" Fails —Valuation Ordered

The House of Representatives adopted on April 26 an order for a valuation of the Boston Elevated Railway, Boston, by the Department of Public Utilities. This becomes effective without action by the Senate. The order follows:

> Ordered, That, as an aid in determining the disposition to be made of the Boston Elevated Railway and its property, including the question of extending or terminating public control of said company, the Department of Public Utilities is hereby directed to investigate the value for transportation purposes of the property of said company, and whether this value is more or less than the option price provided for in Sec. 16 of Chapter 159 of the special acts of 1918, and also whether the value of said property for transportation purposes has been increased during the period of public control through expenditures from carfares and other revenue for maintenance, depreciation reserves or otherwise, and if so, how much.
>
> The department is also directed to investigate as to the reproduction value of the property of said company and to report its opinion as to the amount thereof, less a proper deduction for depreciation and obsolescence. It shall also state its opinion as to the value of the surface lines abandoned by said company. The public trustees charged with the management and operation of said company under said Chapter 159 are hereby directed to furnish said department, on its request, with all facts, figures and other data in their possession that may be of assistance to the department in making such investigations. Said department shall report to the House of Representatives its findings, together with such data as it deems pertinent, by filing the same with the clerk not later than Dec. 1 in the current year.

In commenting on the failure of the Legislature to enact laws to help Boston solve its transportation problem, Governor Fuller said:

> I am tremendously disappointed after urging upon the Legislature in January that the most important matter to come before it had to do with the Boston Elevated; that it should be satisfied in the closing days of the session to promulgate a few questions and then adjourn without doing anything to settle the transportation question for the Metropolitan District of Boston which has to do with the comfort, convenience and accommodation of the working people of this great metropolitan district, and all this without a record vote. This subject has been debated for three years, going on four years.
>
> I should think the members of the Massachusetts Legislature would insist on staying in session if it took all summer to settle this question and settle it right.

Monorail Proposal for Detroit Under Advisement

The City Council of Detroit, Mich., has taken under advisement the question of acting on the proposal of the Rapid Transit Corporation of America to install a monorail line in that city. This course was decided upon following a hearing at which statements made by Del A. Smith, general manager of the department of street railways, about the monorail proposal were characterized by the monorail company's spokesman as "all wet."

The Rapid Transit Corporation proposes to install the system without cost and in return for a share of the fares to let the city operate it for 50 years. Service at 60 miles or more an hour is promised, and it is proposed to operate the line from Miller and Eight-Mile Roads to Jefferson Avenue and thence east across the city, doubling back by way of Chalmers Avenue and Eight-Mile Road.

Utilizing railway to assist refugees

Flood Not Serious for Electric Railways

All factors taken into consideration, the past few weeks have been very difficult ones for the public utilities in the flooded section of the Mississippi Valley states, and next to the work by the Red Cross, these companies have done more than any other one agency to relieve the terrible conditions in the various communities served. The value of their service cannot be estimated.

Contrary to the many reports about conditions in New Orleans, the city is secure and in no danger of being flooded by the waters of the Mississippi River. The New Orleans Public Service, Inc., which controls the important utilities of this section, reports business as usual and independent companies are serving power to adjoining parishes, including St. Bernard and Plaquemines below the city, where an artificial crevasse was created as a further protection to this city.

Outside of New Orleans only three other cities in the lower flood region enjoy electric railway transportation. They are Baton Rouge, Shreveport and Lake Charles. The former, while on the river, is high and dry and the latter two are out of the flood area. According to reports transportation has not been interrupted at Vicksburg, Miss., where the crest of the big flood passed recently.

At the mention of many other cities there flashes in kaleidoscopic view transmission lines patrolled with airplanes and motor boats and fleets of trucks and launches escorting people to safer regions. A fitting tribute was paid the public service companies by Secretary Hoover, following his arrival at New Orleans after studying conditions on the Mississippi. On this point he said: "Had it not been for the transmission lines interconnecting the towns and cities in Arkansas and Mississippi conditions would have been much worse, for no matter where people were forced to go by the floods, there they would find electric service and all of the comforts it implies."

Rebuilt Cars Dedicated at East St. Louis

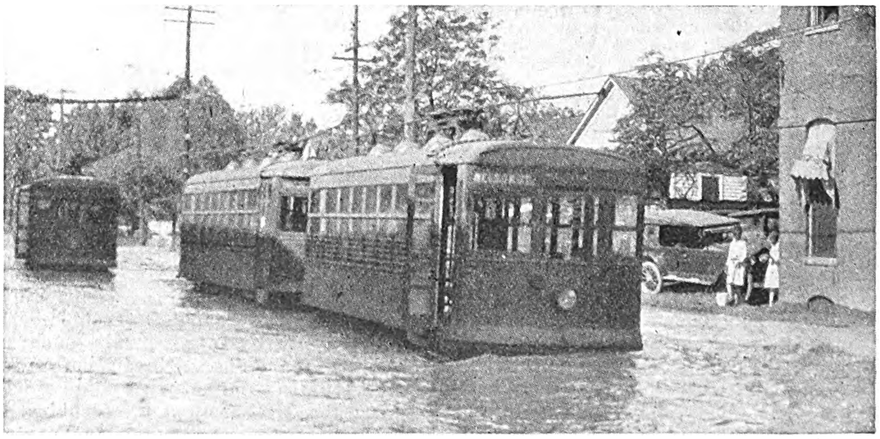
Very unusual dedication ceremonies were held at Jones Park in East St. Louis, Ill., at 2 p.m. on Tuesday, May 10, when prominent matrons of the city christened six "new type" cars for use on the lines of the East St. Louis Railway's Lansdowne division.

It was not generally known that the cars had been rebuilt for the company by the St. Louis Car Company, St. Louis, Mo., as the work was so complete and well done even experts found it difficult to believe that the equipment they were inspecting was rebuilt.

As one of the features of the dedication of the new cars the company, through W. H. Sawyer, president, extended special courtesy passes good during non-rush hours on the city lines to all women of the Lansdowne district who registered at the inspection of the cars. Many took advantage of this offer.

The passes permitted each woman and party to ride between 9 a.m. and 3:30 p.m. and between 6:30 p.m. and 12 midnight on May 10, 11 and 12. The passes were not valid for any part of an interstate fare because of the limitations placed on such service.

The address of welcome was by President Sawyer on behalf of the East St. Louis Railway. This was followed by the unveiling and dedication of the cars. Then came the inspection of the cars by the general public, registration by the ladies of Lansdowne and the parade of the cars with Boy Scout buglers as an escort.



Relentless floods submerged cars at Greenville, Miss.

Safety Crusade in Milwaukee

A street car and a bus crusading in the interest of safety have been placed in operation by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for a month's visual accident campaign, to impress the public with the need of special caution as the seasonal increase in the use of motor vehicles gets under way. Both the car and bus are painted ivory, with safety slogans standing out in vivid green. The car will be operated for two days on each one of the fifteen lines and the bus will be run over the regular bus routes during May. Both vehicles, which transport passengers, carry large front signs "Bound for Safety." They will also be taken to schools, where the driver will tell the children of the increasing traffic hazards.

Gage Change of Radials Opposed

The Council of New Toronto, Ont., has instructed its solicitor to oppose the request of the Toronto Transportation Commission before the Ontario Railway and Municipal Board, for permission to change the gage of the Lake Shore radial line until such time as the board has considered the application New Toronto has before it of what proportion the owners of the street railway are to pay towards the widening of the highway.

Gage-changing is regarded as the crucial step toward linking up the radials with the city system and with each other, enabling the Toronto Transportation Commission to put the resources of each at the disposal of all and effect economies which would at least reduce the annual losses. As one commentator said, it is discouraging to find that neighbor municipalities which now receive electric railway service at Toronto's cost are objecting to the one procedure which can reduce the drain upon Toronto's treasury. It is pointed out that the linking up of radial and city lines will mean better passenger service to the center of the city and quicker express service to downtown points for the people of the territory which the radials serve. A statement said:

> Without the improvement in finances which gage-change would make possible, there can certainly be no improvement in service. Toronto might even be forced to abandon the radials altogether. It is in the interests of all radial municipalities that the York interurbans should be put on a more sound financial basis than that which at present exists. It cannot be done unless the gage is altered.

Providence After Metcalf Trophy

The United Electric Railways, Providence, R. I., has been entered in the 1927 contest for the Metcalf trophy. For the past two years the public utilities of Providence, except the railway, have competed for this trophy. The contest is handled by the Providence Safety Council. *All Aboard*, the official publication of the company, states that the good work now being accomplished by the company should continue. The company hopes that when January, 1928, rolls around it will be found that the record made by it in connection with the factors of the award will be sufficient to bring the trophy to the company. The principal factor for the award is the time lost during the given period, using the number of man-hours worked as the basis.

New Fare Schedule on Northampton Lines

The Northampton Street Railway, Northampton, Mass., has notified the Public Utilities Commission it intends to increase the fares on its lines, effective May 30. The increase in rates is from 1 to 2 cents over the present fare of 7 and 8 cents. Under the new régime a 6-cent fare territory has been established. Under the new plan tickets can be purchased in strips of five for 40 cents, each good for an 8-cent fare; five for 50 cents, each good for a 10-cent fare, and five for 30 cents, each good for a 6-cent fare. Special tickets will be available for one continuous passage between points in section J (Hadley to Amherst) and the railroad station at five for 60 cents. Special tickets at two for 30 cents can be had for a continuous passage from the Academy of Music to any point in the Mount Tom Junction section. School tickets can be purchased in strips of ten at half rates.

Winners Announced in Foshay Advertising Contest

Miss Gertrude Percival, New York, won the first prize of $2,500 in an advertising contest conducted by the W. F. Foshay Company, public utility operators. Second prize went to E. H. Steinmetz, Minneapolis, and to G. S. Ryan, Minneapolis, who made a joint entry. Their manuscript and illustrations won $1,000. Miss Marchette Chute, a first-year student at the University of Minnesota, received third prize, $500. Ten additional prizes of $100 each were awarded.

Coming to Philadelphia: Little Nellie Kelly

Three evenings a week out at the Luzerne carhouse men and women of the Philadelphia Rapid Transit Company are taking fancy steps and repeating smart lines under the direction of a professional dancing and dramatic coach. They have been doing it now for several weeks and the progress so far made augurs well for "Little Nellie Kelly," to be produced at the Academy of Music on May 16, 17 and 18, the proceeds to go to the helping hand fund.

There is talent galore among the employees, and it is not the first time they have put on a show, but no other show has ever provoked so much comment in anticipation of its presentation. This isn't blah. It's a fact. Even the *P. R. T. Co-operator*, Vol. 1, No. 3, for April 28, 1927, was out in new dress in honor of the event. Never before, so far as can be remembered, did the little paper contain such uproarious cartoons. Never before did it scintillate so much with stage stories. Even Mr. Mitten must have rubbed his eyes when he gazed upon the cartoon of Joe Holland and Dorothy Snyder as "Jerry Conroy" and "Nellie Kelly."

News Notes

Seeks Ten-Cent Rate.—Right to collect a 10-cent fare on its Sandusky, Ohio, city lines is sought in a franchise proposal presented to the City Commission recently by the Lake Shore Electric Railway. The franchise under which the company is operating there expired a year ago. Commissioner Schade said that although the present 5-cent fare was likely too low, prevailing conditions considered, he would never vote to permit a 10-cent charge.

Railway Carries Morning Mail. — Early morning mail from Milwaukee will hereafter be carried by the interurban cars of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The United States postal authorities have granted the request of the citizens for this service, which will be started at once. The Waukesha newspaper commends the railway for its speedy co-operation in serving the city with morning mail.

Modern Methods in Sacramento.—Cars of the Pacific Gas & Electric Company operating in Sacramento, Cal., will hereafter be designated by numbers rather than by street names, as in the past. The numbers will be carried in a conspicuous place on the cars and for the convenience of the public the street name of the line will be carried on the dash of all cars for the time being. This announcement was made by E. W. Florence, division manager, who also said that hereafter in the issuance of transfers it will no longer be necessary for the passenger to inform the conductor or motorman where he was going. Under the new system he need only request the transfer.

Close-Ups in Boston.—The Boston Elevated Railway, Boston, Mass., is running on the cover of *Co-Operation*, its pamphlet, close-ups of its employees in various departments. The subject may handle plant or equipment with a view to maintaining it. The April issue shows the car operator handling his equipment by giving direct service to the patrons of the railway. After a glance at the close-up the reader is directed to another page which explains the illustration and the duties of the operators.

Extend Service Over South Side Route.—Direct and more frequent service to downtown Chicago was made available on April 10 to a heavily populated district in the extreme southeast portion of the city when the route of the through Cottage-Grove-South Chicago Avenue cars, heretofore turned back at 93d Street, was extended nearly 5 miles to Ewing Avenue and 180th Street. Under the new plan no transfers will be necessary to reach the downtown district, the headway over this line will be slightly increased and considerable duplication of local, crosstown service will be eliminated. Use was made for the greater part of the distance of tracks over which the Hammond, Whiting & East Chicago interurban cars operate.

Recent Bus Developments

Gary Railways Supplements System with Coach Lines

Two new motor coach lines in Gary, Ind., have recently been added to the co-ordinated railway and motor coach system of the Gary Railways. The new routes serve a section of the city heretofore without public transportation of any kind. They provide in one instance a special luxurious type of express service and in the other a local service during rush hours to and from the steel mills.

Coaches of the former line, known as the Broadway-52d Avenue service, operate on an hourly headway over a route 5¾ miles long between a high class residential district on the south side of the city and the downtown station of the Chicago, South Shore & South Bend, where connection is made with fast electric trains for Chicago.

The route is paralleled three-quarters of the way between terminals by street car tracks, on which a fifteen-minute headway is maintained. The motor coaches operate as expresses for about one-half the distance through the downtown sections, the running time for the same distance being from eight to ten minutes less than that of the street cars, which make all stops. The fare charged is 15 cents, compared with the 8-cent street car rate. Transfers are issued to other car and bus lines.

One of the coach routes just added, and known as the Harrison Street line, is approximately 6¼ miles long. It serves a newly developed residential area in the southwest portion of Gary as well as a densely settled section of foreign population lying close to the downtown business district. Service is maintained with 21-passenger city type motor coaches during the morning and evening rush hours only. The fare is 10 cents with universal transfers. Both lines have been established for an experimental period of 90 days by agreement with the city administration.

Hearings on Albany Bus Fare Concluded

Commissioner Lunn concluded the earings on May 11 on the petition of he Capitol District Transportation ompany, Inc., for a change in its passenger rates of fare in Albany, Troy, ohoes, Rensselaer and in the town of uilderland, in New York, and for per-nission to file new tariffs. The bus com-any seeks to have the fare the same as hat charged by the United Traction ompany, the bus company being a subsidiary of the traction company and upplementing its operation. The ap-lication of the traction company for hange in fares has been heard by the ommission and decision is pending.

At the beginning of the hearing on ay 11, Michael D. Reilly, counsel for e city of Albany, asked for the dis-issal of the petition on three grounds: irst, that the question of segregation f the various lines of the company was still before the commission for decision; second, that the city questioned the right of the company to use as a basis for calculation for rate-fixing purposes the value of property which the traction company or the bus company leased or rented from other companies, and third, the right of either company to use as a rate base the reproduction value of its property, without allowance for depreciation. In connection with the question of segregation, Mr. Reilly called attention to the franchise granted by the city of Albany to the bus company in which it was provided that fares and transfer privileges applicable to the United Traction Company would be the same as for the bus company.

Commissioner Lunn stated that inasmuch as the two cases were so closely related, he would receive the evidence and refer the questions to the commission. Briefs are to be in May 25.

Duplication Not the Answer in Buffalo

The New York State Public Service Commission has issued an order denying the application of the Buffalo Motor Coach Corporation, Buffalo, for a certificate of public convenience and necessity to operate four bus lines in Buffalo in competition with the International Bus Corporation, a subsidiary of the International Railway. In a memorandum on the application, Chairman William R. Pooley called attention to the fact that the International Railway covered 23 miles of the proposed routes of the Buffalo Motor Coach Corporation and the International Bus Corporation operates three lines which serve practically all sections of the city. In its order the commission says that duplication of transportation is not the solution of Buffalo's transit problems. The report was unanimous.

The Buffalo Motor Coach Corporation is sponsored by Ernest M. Howe, Detroit. The company was granted franchises by the Buffalo City Council for the operation of four bus lines in the city on an 8-cent fare with free transfers to connecting lines. The International Bus Corporation charges a 10-cent fare.

Pennsylvania 3-Cent Gas Bill Signed

The 3-cent gasoline tax bill in Pennsylvania was signed by Governor Fisher on April 13. It is estimated that this will produce $22,000,000 of revenue for the next biennium. The bill makes the current 2-cent tax a permanent impost, with the extra cent an emergency levy for the next two years. Provision was made that the entire amount collected from the extra cent—or temporary tax —will be placed to the credit of the motor fund for use by the Department of Highways. The counties will receive one-fourth of the permanent tax of 2 cents a gallon.

Bus Bill Gives Wisconsin Commission Control

After prolonged efforts, street railway interests, independent bus operators, the league of municipalities and the brotherhood of railroad engineers finally agreed on a proposed bus bill and appeared before an assembly committee in Madison, Wis., in support of its passage. Truck owners were the only objectors. The committee recommended the bill for passage immediately after the hearing.

The bill places buses under the regulation of the Wisconsin Railroad Commission, provides for the issuance of a permit to operate, regulate routes and fares and calls for a fee of $25 for a certificate, with an additional charge of $40 for each bus. A special tax is placed on the basis of weight and miles traveled. Cities are given the right to designate routes and to charge a special fee.

Seeks Bus Permit.—The Milwaukee Electric Railway & Light Company has requested the Common Council for a permit to operate a new bus line between North Milwaukee and the A. O. Smith Corporation plant, with transfer privileges to the Milwaukee cars. The request was referred to a committee.

No Stage Line Needed.—Finding that the service maintained by the Petaluma & Santa Rosa Electric lines is adequate and efficient, and that its connections with the Northwestern Pacific Railroad and the Sausalito, Petaluma & Santa Rosa Stage line are adequate and convenient, the Railroad Commission recently denied the application of C. A. Johnson for a certificate to operate a stage line connecting Sausalito and Sebastopol.

Field of Toronto Commission's Activity Extended.—Power has finally been given to the Toronto Transportation Commission, Toronto, Ont., to operate bus lines outside the city. The commission made a strong bid to have the board of control of Hamilton withdraw its opposition to the private bill, which would enable the commission to operate such service. During the week of May 1 the Toronto-Niagara Falls buses ran to Niagara Falls, N. Y., for the first time. Many local manufacturing interests supported the claims of the commission for legalizing operation of the route to Niagara Falls and operation for chartered bus parties.

Buses Substituted.—The Public Service Commission has granted the petition of the New York & Stamford Railway and approved the declaration of abandonment of the line in Port Chester on North Main Street from Mill Street to the state line between New York and Connecticut. In December, 1926, on petition of the company, the commission granted a petition for the abandonment of the Westchester Avenue line and the North and South Regent Street lines. Permission is granted by this order to abandon the remaining portion of the route on North Main Street, which the company alleges should have been included in the previous application. Buses have been substituted for street cars, operated by the County Transportation Company.

Financial and Corporate

Dividend Policy Explained

Circumstances Connected With Passing of Brooklyn City Dividend Reviewed —$11,000,000 for Improvements

The directors of the Brooklyn City Railroad, Brooklyn, N. Y., at a meeting held on May 3 determined that it was to the best interests of the company that no dividend should be paid at this time. The directors felt this suspension of dividends would be a hardship to many, but the earnings are being put back into the property, constantly increasing its value. This will, of course, accrue to the benefit of the stockholders.

The facts thus set forth were made plain in the ELECTRIC RAILWAY JOURNAL for May 7. They tell only part of the story. The company is earning in excess of $1,000,000 a year over and above all operating expenses, reserves for renewals and replacements and a sinking fund sufficient to purchase new rolling stock at the expiration of the life of the rolling stock bought in recent years, and interest on its outstanding bonds and car trust certificates. This does not include the annual installment on the principal of the car trust certificates, amounting to $375,000 a year. The officers of the company have been advised that these cars are capital improvements and they expect that securities will ultimately be issued to reimburse the treasury of the company for these expenditures.

As a matter of fact a plan presented by the directors for a general and refunding mortgage and the sale of $2,500,000 of 6 per cent bonds to be issued thereunder was approved by the stockholders on Dec. 7, 1926, and again at the annual meeting of the stockholders, held on Jan. 10, 1927. Application was then made to the Transit Commission for its approval. Hearings terminated on Jan. 24, but on March 10 the commission denied the application, with leave to the company to renew. The commission, in its decision, raised a number of questions which involve the lease dated Feb. 14, 1893, to the Brooklyn Heights Railroad and the so-called construction account, now in litigation.

Since the separation of the property from the Brooklyn Rapid Transit in October, 1919, the Brooklyn City Railroad has expended for the purpose of extending and improving its service approximately $11,000,000 for capital additions, betterments and improvements. Of this amount approximately $1,000,000 was derived from the sale of capital assets. Additional securities have been issued and are now outstanding in respect of such expenditures as follows: $4,000,000 of stock issued in September, 1924, as a stock dividend and $3,000,000 of equipment trust certificates, of which $750,000 have been retired. The balance of such capital expenditures, something more than $3,000,000, the railroad's officers believe could be capitalized under the law. In the belief that the commission would approve the proposed general and refunding mortgage and the issuance of securities thereunder, which the company had arranged to sell, it borrowed some $800,000. The action of the commission denying the application must result in a considerable delay in any proposed financing. H. H. Porter, president of the company, points out that under decisions of the Supreme Court of the United States in valuation cases concerning other utility companies the property of the Brooklyn City Railroad has a value largely in excess of the par value of its stocks, bonds and all other securities.

Texas Line Surrenders Railway Charter

Economic necessity is given by the Paris Transit Company, Paris, Tex., as the reason for the surrender of its charter to the Secretary of State. The company has owned and operated the railway system of Paris 37 years. It began with old-time mule cars, but in 1894 it converted the system to electric operation. Notwithstanding the fact that Paris has grown to a city of more than 15,000 population, the company finds itself unable to compete with the private automobile and the "For Hire" car and has decided to abandon its lines. W. G. Moore, manager, said that in authorizing fare increases and preventing bus competition the city officials had undoubtedly prolonged the life of the company, but the competition from privately owned automobiles reduced the revenues of the company to a point where hope had disappeared that the line could ever again be made profitable. The company operates 5.5 miles of line.

Philadelphians Purchase Washington-Virginia Road

The Washington-Virginia Railway, which operates a railway line connecting Mount Vernon, Alexandria, Washington, D. C., Falls Church and Fairfax Courthouse, has been sold under the hammer, including equipment, and brought $575,000. The purchasers represented bondholders and noteholders and were all Philadelphians. It is understood they will operate the road just as soon as the sale is confirmed by the court.

The property was sold in parcels. Lewis H. Parsons bought the Mount Vernon division, extending from Washington to Mount Vernon, for $300,000; the Falls Church division went to John McMullin of Philadelphia for $150,000; the equipment to John Wayne of Philadelphia for $125,000.

The road has 60 miles of track and there were outstanding bonds totaling $3,500,000. It has been in the hands of receivers since November, 1923.

Approval of $20,000,000 Brooklyn Refunding Issue Sought

The New York Rapid Transit Corporation, the subway operating subsidiary of the Brooklyn-Manhattan Transit Corporation, applied to the Transit Commission on May 7 for permission to issue $20,000,000 in additional refunding mortgage 5 per cent sinking fund gold bonds. The proceeds will be used to cover $3,375,000 spent for equipment from July 1, 1923, to April 1, 1927, and $12,625,000 for the purchase of equipment for subway and elevated lines.

William S. Menden, president of both the B.-M. T. and the Rapid Transit Corporation, told the commission that the B.-M. T. proposed to take over the $20,000,000 in bonds at 80 per cent of par, or to pay $16,000,000 for them. He said this was all that could be obtained for the bonds in open market. Duncan A. Holmes, vice-president Chase Securities Company, confirmed this assertion, and added that 80 per cent was all the bonds would fetch.

Of the $12,675,000 to be spent, $9,700,000 will be for operating equipment, mostly for 363 new steel cars which the company has been directed by the commission to buy, and $2,700,000 will be for the Fourteenth Street-Eastern line shops and yards. Transit Commissioner Leon G. Godley reserved decision on the application.

Stockholders of Grand Rapids Company to Meet May 25

Stockholders of the Grand Rapids Railway, Grand Rapids, Mich., at a special meeting on May 25 in Grand Rapids, Mich., will act upon the proposed readjustment of the finances of the company in accordance with the plan outlined in the ELECTRIC RAILWAY JOURNAL for April 16, page 718. This plan of readjustment contemplates the organization of a new company to take over the assets of the present company and the cancellation of all of its common stock, and extinguishment of $600,000 of its indebtedness through the issue of common stock of the new company, and the exchange of preferred stock on the basis of two shares of new company common stock for one share of present preferred stock, the depositors of which are also offered subscription rights. The plan also provides for the authorization of additional preferred stock by the new company to provide funds further to reduce existing indebtedness and for other corporate purposes.

Question of P.R.T. Underlying Companies Again

Governor Fisher of Pennsylvania on May 3 signed the Daix bill enabling the city of Philadelphia to institute proceedings for the condemnation of the underlying companies of the Philadelphia Rapid Transit Company and the Philadelphia Rapid Transit Company itself. Under the Daix act the city need not take the entire system, but may condemn the underliers only, if it so desires. Mayor Kendrick expressed satisfaction when he heard about the Governor's act. He said he thought it was a step in the right direction and would aid materially in the solution of the transit problem in Philadelphia at some future date. Under the Daix act the city could condemn and acquire not only all surface, underground and elevated transit facilities but also buses, taxicabs and trackless trolleys within the city, and leases for such operation and all plant and equipment connected with these facilities.

Seattle Financial Status Improves

The Seattle Municipal Railway system, Seattle, Wash., is recovering from the strain of a $1,100,000 bond interest and principal payment which followed refusal of the local banks to assist the utility over a financial emergency. By June 10, it became known recently, the railway will have paid off, out of its current earnings, $735,000 loaned from other city funds to tide it over the recent crisis and will have no indebtedness outstanding except bonds and warrants representing capital investment.

In order to have ready the money due on March 1, 1927, to Stone & Webster as interest and principal on the railway purchase bonds, the city treasurer started on Dec. 19, 1926, to turn all the railway's daily receipts into the special bond interest and redemption fund. At the same time the railway's current fund, known as the city railway fund, was placed on a warrant basis. When the banks refused to cash the payroll warrants, two loans totaling $735,000 were made from the city light department. So rapidly have these loans been repaid that now only $250,000 remains unpaid. It is expected this sum will be wiped out within the next five weeks. On Aug. 1, 1927, it will be necessary to have on hand $255,050 to meet the semi-annual interest payment on the purchase bonds due on Sept. 1, but the city officials believe this can be handled without the need of putting the railway fund on a warrant basis.

Figures Show Trend in Sioux City Since Fare Increase

In March, 1927, the first month the rate of fare on the cars of the Sioux City Service Company, Sioux City, Iowa, was advanced to 8 cents and two tickets for 15 cents, passenger revenue showed an increase of only 2.20 per cent, while the revenue passengers showed a decrease of 13.8. That month happened to be a poor riding month due to nice weather and also to the agitation over the fare increase. During April, a good riding month due to rainy and cold weather, the passenger revenue increased 11.09 per cent, while the number of revenue passengers decreased 6.43 per cent. This is in line with the previous decrease in the company's revenue passengers.

Company officials are said to believe this condition to be difficult to correct as it is due to the preponderance of automobiles. During 1926 the company suffered a decrease of 7.60 per cent in the number of revenue passengers carried and 7.70 per cent in passenger revenue. The old rate of fare was 7 cents with four tokens for 25 cents.

Passenger Receipts Slightly Lower in Allentown

The operating results of the Lehigh Valley Transit Company, Allentown, Pa., for 1926 do not compare favorably with those of former years. This was the initial statement of P. B. Sawyer, president, in his report to the stockholders. Passenger receipts are still on the decline, although the loss has been offset in a measure during the latter part of the period by the establishment of bus service operated where that form of transportation appears to be practical and more economical than railway service. Owing to increased expenditures for maintenance, the current operating expenses have increased approximately 2 per cent.

CONSOLIDATED INCOME ACCOUNT OF THE LEHIGH VALLEY TRANSIT COMPANY AND SUBSIDIARIES FOR THE YEARS ENDED DEC. 31.

	1926	1925
Total gross earnings	$4,950,443	$5,047,104
Total operating expenses including taxes	3,710,217	3,603,062
Net earnings from operation	$1,240,226	$1,444,041
Income from interest on bonds	977	906
Income from interest on notes and deposits	28,025	3,618
Income from dividends on stocks	110,075	110,075
Total net earnings	$1,379,303	$1,558,642
Depreciation allowance	$277,712	$377,798
Interest—funded debt	599,585	599,802
Amortization of discount and expenses	21,593	21,705
	$898,890	$999,306
Net income	$480,413	$559,335

The physical property of the company has been adequately maintained and the transportation service supplied to the public has been kept up to the past standard.

With the approval of the Public Service Commission, the company has abandoned 11.9 miles of line between Wales Junction and Chestnut Hill and the service is now being supplied by buses, operated by the new subsidiary, the Lehigh Valley Transportation Company. In addition to this service, the company has entered new territory with a bus line operating on Turner Street, Allentown. These additions bring the total buses operated by the bus company to sixteen, covering four routes.

The company is now operating, in addition to the bus service 312 passenger, freight and work cars, over 203 miles of track. The accompanying table shows the income account for 1926 compared with 1925.

Depreciation Case Goes Over

Postponement has been secured by the electric railways of the hearing by the Interstate Commerce Commission on the depreciation case. This deferment will hold until further order of the commission.

Lucius S. Storrs, managing director of the American Electric Railway Association, said that the electric railways were fortunate in having additional time to prepare carefully the case of the electric carriers and must be able to present to the commission the complete economic and statistical aspects of the theory of depreciation as applied to the electric railroads and as called for by the forms previously sent out. For the purpose of having this complete presentation it will be necessary actively to continue collecting and collating the statistics of the industry. The committee now at work desires the hearty support and co-operation of all in the industry. All those who have not already filed their answers to the association's depreciation questionnaire are requested to do so as promptly as possible.

Net Earnings Show Improvement.—For the year ended Dec. 31, 1926, the gross revenues of the railway department of the Northern States Power Company and subsidiaries were $268,705, against $277,578 for the year previous. Net earnings showed a loss in 1926 of $30,654, against a loss in 1925 of $61,858. The Northern States Power Company is operated by the Byllesby Engineering & Management Corporation and runs railway lines in Fargo, N. D.; Eau Claire and Chippewa Falls and a line connecting Eau Claire, Chippewa Falls and Altoona.

Defaults on Bond Payment.—Talmadge G. Cherry, vice-president of the Rochester & Syracuse Railroad, Inc., Syracuse, N. Y., announced on May 2 that the company was obliged to default the payment of $62,500 interest on the $2,500,000 of 5 per cent gold bonds of the company. Mr. Cherry declared that the road would continue to function as in the past.

Net Income Increases.—For the first quarter of 1927 the gross revenues of the Twin City Rapid Transit Company and subsidiaries, Minneapolis, Minn., were $3,665,898, against $3,839,102 for a similar quarter of the year previous. Operating expenses fell off from $2,794,755 to $2,608,388 for the 1927 quarter. After the consideration of fixed charges and taxes the net income for the 1927 quarter was $481,402, against $448,360 for the first quarter of 1926.

Deficit in Buffalo.—For the three months period ended March 31, 1927, the operating revenue of the International Railway, Buffalo, N. Y., was $2,515,944, against $2,709,594 for a similar period in the year previous. Expenses and taxes increased from $2,283,271 in the 1926 period to $2,290,797 in the 1927 period. After the consideration of income deduction, the three months operation of 1927 ended with a deficit of $124,888, against a net income of $64,298 for the period from January to March, 1926.

Settlement of Affairs of Indianapolis Property Awaited.—A step nearer settlement of the affairs of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., was taken recently with attorneys filing additional special findings in the foreclosure of the $2,000,000 mortgage. Resumption of the case follows a recess due to the death of Charles L. Henry, founder of the line and its president and receiver. It is expected that Judge Will M. Sparks of the Circuit Court at Rushville, Ind., will name another receiver. More than fifteen attorneys, representing many clients, are interested in the case.

Book Reviews

Mathematical Principles of Finance—Second Edition

By Frederick C. Kent. New York, N. Y.: McGraw-Hill Book Company. Price, text alone, $2; text with tables, $4; table alone, $4.

Frederick C. Kent, associate professor of mathematics Oregon State Agricultural College, has revised this textbook on the mathematics of investment and insurance. In the new edition special attention has been given to interpolation methods. The original problems have been simplified and many additional practical problems have been added. The book covers the fundamental principles of the theory of interest and annuities and gives application to valuation, depreciation, amortization and other financial elements.

What Price Progress?

By Hugh Farrell. New York: G. P. Putnam's Sons. 323 pages. Price, $2.50.

Here is a book akin in some of its aspects to "Anticipations," by H. G. Wells. The subject of the author is the stake of the investor in the discoveries of science appraised in the light of the question: Is America keeping step with the rest of the world in the application of science to industry? The publisher of "What Price Progress?" is correct in his statement that this book answers that question. It boldly sets forth that which is and that which is not being done toward holding the country's place in the economic world. And the author does so in simple, non-technical language, in a style that has been likened to that of Matthew Arnold.

Not many of us have thought about it in that light, but the chemist is making a new world. Mr. Farrell makes plain how this is being done. He also makes plain how many other things are being done. He has a positive genius for uncanny presentation of facts. What, for instance, could be more engrossing in a discussion such as that of Mr. Farrell's than to couple under one head paint, silk stockings and dynamite and at another point phonographs, photographs and philanthropy. There is alliteration in the one and the idea of catastrophe in the other.

It is hardly an exaggeration to say that the book should appeal to everybody everywhere with an intelligent interest in the progress of industry. Of special interest to railway men is the chapter "Science and the Railroads." Here much that is controversial is touched upon by the author, but whether or not one agrees with all that Mr. Farrell says, there can be no question about the stimulating effects upon the reader of what he has set down. The author sees the railroads in the grip and under the domination of the rate makers. He says their only hope of adequate returns on their capital appears to lie in the direction of increased efficiency and lower costs of operation. Least of all, can they afford to look with complacency upon the drying up of the sources of new knowledge.

While he does not minimize the good work along scientific research lines that has been done in the United States, Mr. Farrell feels that there is not in this country the interest in and the understanding of the immense importance to every sort of scientific research, both pure and applied, there should be, and that unless industrial leaders and investors change their methods and bring American industry to the front by full utilization of scientific help it is likely to be outstripped in the keen competition of these modern, scientific times. He says:

> Every application of science which results in lower production costs through either a saving in labor or in raw materials, or which gives a new, useful product or increases the use of old products is directly beneficial to every man, woman and child living in the areas served by the industries making the improvement. The benefits extend even beyond that, they go to generations yet to come and to remote corners of the earth.

At the risk of repetition, be it said again of Mr. Farrell that there is nothing of Dryasdust about him.

Making Transportation Pay

A digest of presentations made by electric railways to the Charles A. Coffin Foundation; edited by Henry H. Norris, with an introduction by Frank R. Coates. American Electric Railway Association, New York. 227 pages, exclusive of appendix and index. Price, $2.

Important changes have been made in this, the fourth in the series of "Electric Railway Practices." Most significant, of course, is the change in name of the volume to "Making Transportation Pay." Sprinkled through the book at the bottom of some fifty pages are principles which start with "Better Service Is the Answer to the Problem of Competition," and finish with "A Fair Valuation Includes Going Value." It may appear that emphasis of the last-mentioned innovation just at this point is out of proportion to its significance. While the change is, of course, one of typography, it is noteworthy because it has resulted in emphasizing principles that need constantly to be reiterated. This list of principles, for that is what it really is, distributed throughout the chapters epitomizes many of the outstanding characteristics of good electric railway service in a form calculated to attract attention. The principles should prove useful in advertising, in educational work and in other directions. They are in line with the general tendency to formulate codes and creeds based on experience and conviction. The principles are based on the text of the book, but the editor has had the co-operation of the managers of the companies represented in the volume in formulating them and in estimating the relative importance of the different achievements of the companies.

If ever a book were the bible of an industry, "Making Transportation Pay" is that book. This does not mean that the practices set forth therein are the only ones to be followed in a given case. No one would be so foolish as to make any such claim, but the practices of the contestants as set forth represent the application of principles that have been tried and not found to be wanting. The topics were selected and the material classified to show, first, the present status of the electric railway as a revenue producer, as a public service agent and as a part of the community. Then the ways in which this status has been improved are described. Finally, the means for operating a property more economically and smoothly are taken up and illustrated.

As H. H. Norris, the editor, points out, a comparison of this volume with its predecessors will disclose the particulars in which progress is being made most rapidly at present. Most noteworthy is the place being given to the bus. Co-ordination of rail and bus is already taken as a matter of course, but numerous details are still in the problem stage. Progress is being made in the accounting aspect of co-ordination. It is essential to know just what bus operation is costing in order that service may be rendered with full knowledge even if it cannot be directly profitable.

Attractiveness of all equipment is another element now recognized as essential to good service. Cars and buses are being designed with due reference to comfort, brightness, noiselessness and safety, all features which appeal to the public. This does not imply that the operating and maintenance features, like durability, general reliability and low power consumption, are being overlooked. The reverse is true. But the aim is to make service salable, as well as efficient; hence the present stress on items of strong public appeal. This leads directly to salesmanship, which now is taken to include a wide range of activities, such as public relations, advertising and ride-selling fare plans, as well as direct selling.

From the beginning of the series the "Practices" have been segregated somewhat in order to make them readily accessible for reference. In the present volume the segregation has been carried farther, bringing together, for example, in one chapter the items of greatest interest to the master mechanic, in another those of interest to the way engineer, and so on. Thus construction and maintenance in a given department are brought together, which will render easier than before the finding of any one class of articles.

But to return to the physical make-up of the volume. In the early part the electric railway is considered largely from the standpoint of the public; in the latter part from that of the management. In other words, the quality of the service is first set forth and then the ways in which the quality is maintained are taken up in detail.

In his foreword to the volume Frank R. Coates, president of the American Electric Railway Association 1925-1926, is correct in the statement of his belief that it will profit every electric railway looking for ways to make public transportation pay to study carefully the many methods employed by all of the contestants for the 1926 Charles A. Coffin award. In fact, the main title, "Making Transportation Pay," was selected for the volume because it epitomizes the present trend of managerial thinking. The book shows that transportation is being made to pay, and therefore can be made to pay even more generally. Still more important than this, the volume tells how to do it.

Benjamin Garver Lamme

Late chief engineer of the Westinghouse Electric & Manufacturing Company. An autobiography, New York, N. Y.: G. P. Putnam's Sons. 1926. 271 pages. Price $3.

B. G. Lamme was a great engineer, and his autobiography is more than an account of the personal accomplishments of the man. Beneath the record of events which is set down the reader will quickly discern the reasons for the author's success. It is true that the book is primarily an engineering history, but as much as Mr. Lamme might seek to mitigate his own part in the record of engineering accomplishments the record of his interest in people and his sympathy for the problems arising from human causes shines through the formal record. This was inevitable. And the human characteristics weave themselves into the descriptive matter so inconspicuously as to hold the reader's attention. One forgets the leaven because the bread is so good.

The manuscript covers a record of his first thirty years of engineering work. After it was nearly completed Mr. Lamme began to revise the material. This work he never completed. In editing the two manuscripts an attempt has been made to give every thing possible from his own memorandum to cover the development in the art of designing dynamo-electric machines.

The material has been grouped into ten chapters with an appendix. The first covers the life of Mr. Lamme from birth through college. The second relates his early test room experience and the third early machines from pre-calculated designs. The next four chapters cover different periods of development. Chapter IV covers the period of 1892 and 1893, with its relation of the work done for the World's Fair and on the Niagara power development. Chapter V takes the period of 1893 and 1894, when the induction motor began to receive serious consideration. Another chapter covers the period from 1895 to 1900, with its demand for alternating-current motors for use in hoist, crane work and the like. Railway electrification is treated in Chapter VII, which covers the period from 1901 to 1919. Three other chapters cover other lines of work done by Mr. Lamme, his personal traits and hobbies and his recollections of some old timers. On the whole, the work is an intimate history of the pioneer development of electrical engineering by one who took a leading part in it. It is especially inspiring to the young engineer.

Personal Items

Burt Hamerstrom Vice-President at San Francisco

Burt Hamerstrom, manager of the commercial department of the Market Street Railway, San Francisco, has been elected a director and a vice-president of the company. Mr. Hamerstrom will continue in charge of the commercial department. No other changes in the directorate or officers were made.

Mr. Hamerstrom's appointment to the company was noted in the ELECTRIC RAILWAY JOURNAL for Oct. 16, 1926, page 749. He spent about ten years as a newspaper reporter and feature writer in San Francisco, Chicago and Seattle. For more than ten years he has been associated with public utilities, serving with the United Gas Improvement Company and Welsbach Company in Philadelphia and with the North American Light & Power Company—Illinois Power & Light Company—in Chicago, where he helped to direct the commercial, customer - ownership, public relations and advertising activities for properties in more than 100 communities in several states.

Charles E. Smith Expert in New York City

With the keys of the city which were unofficially presented to him, Charles Edward Smith, transit expert, will try to unlock the Times Square door for the outpouring of New York City's millions. Mr. Smith, who was appointed by Comptroller Berry to make a transit survey, has already started upon his task, as was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of April 16, page 712.

This Western expert, who will likely submit his report between May 30 and June 1, has had broad experience in railroad construction, in municipal development and in the service of the government. From 1897 to 1908 he acted as civil engineer for various municipalities, railroads, industrial organizations and for the government. In 1908 and until 1915 he was in charge of the maintenance and new construction of 7,000 miles of railroad for the Missouri Pacific. At that time he entered private practice in St. Louis, remaining in that work from 1915 to the outbreak of the war.

Since the war and with the exception of the interruption for war service Mr. Smith has been adviser to the city of St. Louis on railroads, river and utility matters. He built a reinforced concrete river terminal, negotiated franchises and made valuations for settlement of railroads and electric railway difficulties, acted as an arbitrator in wage controversies and gave expert testimony in law suits. Among his specific accomplishments are the construction of a railway belt line around Oklahoma City, electrification of 20 miles of track in St. Louis for heavy electric locomotives and building of numerous bridges for the Texas & Pacific Railroad. While in the government service he supervised and advised upon much of the war-time construction, particularly on undertakings in the South and West.

Mr. Smith was born in Somerville, Mass., in 1877. He received the degree of bachelor of science in civil engineering from the Massachusetts Institute of Technology in 1900. His society membership includes the American Society of Civil Engineers and A.R.E.A. He belongs to the Engineers Club of St. Louis.

Status of Appointments to Ohio Commission

In a Senate caucus it was decided not to confirm the nomination by Gov. Vic Donahey of Walter McKinney for the third place on the Public Utilities Commission of Ohio. However, this action was not reported out on the floor of the Senate and no further action will be taken on the matter at once. The Senate previously had confirmed the Governor's appointment of James W. Huffman, his son-in-law and former secretary, and Judge William Klinger, Lima, to places on the commission. They succeeded George Poor and Charles C. Marshall, whose terms expired some time ago. George Mauller is the other member now serving on the commission. His term also expired some time ago.

C. C. Giles Resigns from Porto Rico Company

Carl C. Giles, for the last two years president and general manager of the Porto Rico Railway & Light Company, San Juan, P. R., has resigned and is returning north. In the short time he has been in charge Mr. Giles has worked wonderful changes in the service of the railway system. The new cars now in service were designed by him to meet tropical needs. Wages were increased, a pension fund and a sick benefit fund were established and bonuses were provided as rewards for particularly meritorious services. It is said that the passage of the Butler bill, which he believed added unnecessary burdens to doing business in Porto Rico, affected his decision about renewing his contract.

Changes in Rhode Island Personnel

Several changes affecting various departments were effective as of May 1 on the lines of the United Electric Railways, Providence, R. I.

Thomas E. Tefft has been elected comptroller to succeed George S. Hutchins, who has resigned.

Ralph E. Nock has been elected assistant comptroller, the position formerly held by Mr. Tefft and, in addition, will for the time being continue his present duties as office manager.

Ralph Gordon, who has been auditor

of property accounts, will assume the position of chief clerk, in the assistant comptroller's office, now held by Arthur E. Cawthorne, who has resigned.

Robert T. Watt will succeed Mr. Gordon as property clerk and will be in charge of property accounts.

Cecil E. Waldron, who has been chief clerk in the office of the superintendent of equipment, has been transferred to the accounting department and will be succeeded by J. Edward Shaw, now employed in the office of the superintendent of equipment.

Thomas G. Webber, who has served as electrical engineer in the office of Vice-President Slade, will assume general direction of the equipment department, as acting superintendent of equipment.

New Members of Indiana Commission in Office

The three new appointees to the Indiana Public Service Commission took their positions on May 1. The appointment of Calvin F. McIntosh, Worthington, and Harvey Harmon, Princeton, to be the Democratic members to succeed Frank Wampler and Clyde H. Jones, respectively, and the reappointment of Howell Ellis, Indianapolis, Republican, were announced by Governor Jackson after several days of consideration of the various applicants for the vacancies. Mr. McIntosh is a member of the federal board of vocational education. Mr. Harmon secured his appointment through the resignation of Mr. Jones and his term will expire May 1, 1929. Mr. Ellis was appointed to the commission in December of last year to fill a vacancy caused by resignation, and his term, as that of Mr. McIntosh, is for four years. Mr. Ellis had served as secretary of the commission for about eighteen months before his appointment to the body. He was a newspaper man before that, assigned to the statehouse for one of the Indianapolis papers.

Richard Siegmann, manager of the Städtische Strassenbahn, Rostock, has returned to Germany after a visit to the United States as a member of the delegation sent to this country to study traffic regulation. He visited New York, Washington, Philadelphia and Buffalo, in which he deemed conditions to be sufficiently representative to serve his purpose. He was especially impressed with the handling of rapid transit traffic on the lines of the Brooklyn-Manhattan Transit Corporation and the Interborough Rapid Transit Company. In an interview with a representative of the ELECTRIC RAILWAY JOURNAL he emphasized the fact that the German companies were quick to see the need for co-ordinating the railway and bus services and said he was struck by the evident extent to which this same trend was apparent in the cities that he visited here and in those about which he had obtained facts. He will report his findings to his own directors and also to Ludwig Spängler, director of the Städtischen Strassenbahnen at Wien and president of the Internationaler Strassenbahn und Kleinbahnverein.

Changes in Buffalo

M. L. Campbell New Interurban Manager, Succeeding Robert C. Larkin —New Incumbent Former Freight Conductor

M. L. Campbell

B. J. Yungbluth, president of the International Railway, Buffalo, N. Y., recently announced the appointment of Marcus L. Campbell, Lockport, as operating manager of the interurban division, effective on May 5. Mr. Campbell has been manager of the Lockport division since 1924. In his new position he will be responsible for service on the Buffalo-Niagara Falls high-speed line, the Buffalo-Lockport-Olcott division, the company's electric freight service, local service in the cities of Niagara Falls and Lockport, the Canadian Park and River division from Chippawa to Queenstown, and the Canadian side of Niagara's Great Gorge Trip.

The new manager entered the service of the company in 1922 as a freight conductor. His ability was quickly recognized. A year later he was made assistant superintendent of the Lockport division and in January, 1924, he became superintendent of that division. Less than two years later he was made freight traffic manager of the company. These two positions he held until his recent promotion.

R. C. Larkin

Mr. Campbell is well known in transportation circles on the Niagara Frontier and throughout the country, having been for some time with the Louisville & Nashville Railroad, the Washington Terminal Company and the American Railroad Association. He also is known for his service with the United States Marine Corps from 1913 to 1919, entering as a private under Gen. Smedley D. Butler and being discharged as captain. During this period he saw 5½ years of foreign service.

In commenting on the appointment, President Yungbluth said that Mr. Campbell's experience and ability have been valuable assets to the company.

Robert C. Larkin, Mr. Campbell's predecessor, was associated with Mitten Management for eight years. He spent four years as operating manager of the Darby, Media and Chester lines of the Philadelphia Rapid Transit Company in Philadelphia and for the past four years has been stationed at Niagara Falls, N. Y., as operating manager of the interurban lines of the International Railway. These include the Buffalo-Niagara Falls high-speed lines, Buffalo-Lockport & Olcott high-speed lines, all freight service, the local lines at Niagara Falls, N. Y.; Lockport, N. Y.; the Park & River division on the Canadian side; the Canadian portion of the Gorge Belt line, and the two international bridges.

Previous to that assignment Mr. Larkin was general manager of the Denver & South Platte Railway for seven years and served for twelve years with the Denver Tramway under the John A. Beeler management.

Broader Field of Safety for Victor T. Noonan

Victor T. Noonan, supervisor of accident prevention for the Chicago Surface Lines, Chicago, Ill., has resigned to become manager of the accident prevention department of the Chicago Motor Club. Mr. Noonan is going into a broader field of public safety work, in which he has already had a wide experience. For six years he was State Director of Industrial Safety in Ohio and afterward he organized the accident prevention work of the Cleveland Railway. In 1923 he became connected with the Chicago Surface Lines and installed a system of accident prevention which, since that time, has produced remarkable results. He established accident prevention committees in all departments, installed accident prevention suggestion boxes throughout the organization, conducted safety meetings for the trainmen and all employees at regular intervals and, to stimulate further the work, started an accident prevention contest in the train service.

Mr. Noonan was chairman of the general advisory council of the Chicago Surface Lines, which represented principal department heads. He was also a member of the Mayor's Safety Commission of the city of Chicago. He was chairman of the committee which had charge of safety during the Eucharistic Congress in Chicago and at present is chairman of the public safety committee of Metropolitan Chicago. He is a member of the board of directors of the Chicago Safety Council.

W. Kesley Schoepf Dead

Former Head of Cincinnati Traction Company Succumbs to Heart Disease at Age of 62—Noted Engineer Active in Railway Field in Many Cities—Organized Cincinnati Car Company

W. KESLEY SCHOEPF, president of the Cincinnati Car Company and former head of the Cincinnati Traction Company, died of a heart attack at his home in Cincinnati on May 6. He had been thought to be recovering from a recent attack of illness, but succumbed suddenly. Mr. Schoepf withdrew from active participation in the transportation field on Oct. 28, 1925, when he relinquished control of the railway in Cincinnati. He continued, however, as president of the Cincinnati Car Company, organized in 1913 to manufacture cars. At the time of his death he was also one of the directors of the Dalton Adding Machine Company and trustee and treasurer of the Hillsdale School for Girls.

Men of strong convictions and direct action like Mr. Schoepf are frequently misunderstood. That was his lot on several occasions, for it is a human failing to appraise by an incident rather than to take into account the acts of a lifetime. But it is by the acts of his lifetime that Mr. Schoepf must be adjudged, and by that token, however much he may have seemed to others at times to be in the wrong, he was a power for good. To few other men, if to any, is the debt of gratitude of Cincinnati greater. Many men now prominent in public life in the city owe their start to him. Acknowledgment to this end was made on the occasion of the banquet that he tendered to the veteran employees of the company when he formally withdrew from railway service in Cincinnati.

On this occasion much fuss rightly was made over the fact that Mr. Schoepf at his own expense presented a gold watch to each of 454 men as a token of his esteem. Naturally this was big news of its kind, the kind that cannot well be kept from the newspapers, but it represented only a tithe of the total of the generous, kindly things done unobtrusively by the man that endeared him to his immediate followers.

Career Started as Engineer

Quite naturally it was within Mr. Schoepf's power to have the material things that money will buy, but it is not platitudinous to say that among the possessions he prized most was the remembrance of the farewell banquet made permanent in the form of a book edited and published under the auspices of the Optimists' Club and the Queen City Club of Cincinnati. This is a work that will now be cherished more than ever by his associates and friends.

This man, who for more than 25 years presided over the railway at Cincinnati as its head, was without college training, but he was a man of liberal education. He was by profession a civil engineer. He had been chief engineer of the Rock Creek Railway, Washington, D. C. He was vice-president of the Eckington & Soldiers' Home Railroad and the Belt Railroad of Washington, D. C. He was general manager and chief engineer of the Columbia & Maryland Railroad, Baltimore, Md. In Pittsburgh he was vice-president and general manager of the Consolidated Traction Company. In Cincinnati he was president and chairman of the board of the Ohio Traction Company, which owned the stock of the Cincinnati Traction Company, the operating company in that city before it was succeeded by the Cincinnati Street Railway, with Walter A. Draper at its head, in the fall of 1925 on the occasion of Mr. Schoepf's withdrawal as an operating executive with the city system.

Mr. Schoepf arrived in Cincinnati from Washington, D. C., on Feb. 21, 1901, about the time that Hugh J. McGowan arrived from Indianapolis. Both were connected with the interests that had leased the electric railway system from the Cincinnati Street Railway. For the short time that Mr. McGowan was president of the company Mr. Schoepf served as chairman of the board. Soon afterward Mr. Schoepf became president of the company, representing the Widener-Elkins syndicate of Philadelphia.

W. Kesley Schoepf

During the 25 years Mr. Schoepf headed the electric railway system in Cincinnati he was, perhaps, more definitely in the public eye than any other man in the city. Electric railway men frequently are. He first delegated public relations work to the late Benson Foraker, son of Senator Foraker, and later to Walter A. Draper, both vice-presidents of the Cincinnati Traction Company. Each in his peculiar way possessed the faculty of turning away wrath. But the most unforgiving enemies of Mr. Schoepf do not deny that in the quarter of a century he made many real contributions to the welfare of the city.

One of these achievements was his part in the rescue of the Zoological Gardens from extinction. At the time he was induced to take hold the property was run down. The stock of animals was small and of scant variety and the attendance of the public decreasing. By hard work Mr. Schoepf brought the Zoo to its former renown and helped to advance it still further in reputation.

In 1903 Mr. Schoepf built the second skyscraper in Cincinnati, the Cincinnati Traction Building, the first being the Union Trust Building. He gave Cincinnati one of its large industries, the Cincinnati Car Company. He started the orphans' outings that have since been taken over by the Cincinnati Automobile Club and other organizations of a civic and professional nature.

In his long tenure as operating head of the railway the only serious conflict with employees was the strike of 1913. Personally his relations with the employees were friendly.

A District Loss to City

The place that he scored for himself was achieved by Mr. Schoepf by his keenness of brain, tireless energy and willingness to "play the game." He was both the doer and the dreamer, quick to translate thought into action, so quick at times that he confused his adherents at the very time he confounded his opponents. These characteristics of the man are reflected in the comment of the Cincinnati *Times* to the effect that:

> The sudden death of W. Kesley Schoepf removes from Cincinnati life one of its most interesting figures. For 25 years he had been constantly in the public eye as the head of the Cincinnati Traction Company. Naturally in the period of that organization's vicissitudes, the period of increasing car fares and decreasing car profits, he loomed large in popular discussion. He had battles to fight, and he fought them with vigor. He had contentions with citizen organizations, labor organizations, public officials and private interests. He asked no quarter and gave none. All in all, however, Mr. Schoepf was a many-sided man—a fast friend, a dauntless foe, a public-spirited citizen and a progressive man of affairs. He also was a patron of art and culture and a liberal steward in philanthropy. He contributed materially to Cincinnati's progression. Cincinnati regrets his going.

Marshall G. Linn, vice-president and general manager of the Des Moines Electric Light Company and the Iowa Power & Light Company, died in Des Moines recently. He first attracted notice in the railway field in 1917 when the railway at Bloomington was purchased and later combined with the Consumers Company by the late William B. McKinley. The combined property was placed in charge of Mr. Linn. Greater responsibility further developed his capabilities and his administration of the Bloomington company ranked with the most successful of any controlled by the Illinois Traction System. In Bloomington Mr. Linn was trained for greater opportunities and when the opening in Des Moines appeared he took charge of the affairs of the Des Moines Electric Light Company. With the formation of the Iowa Power & Light Company, after the company at Des Moines had been acquired by the present Illinois Power & Light Corporation, Mr. Linn was made vice-president and general manager.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Commercial Car Service Magazine

So that operators of commercial cars may have the benefit of Studebaker's extensive research and experimental work in the field of successful automobile operation and service, a commercial car edition of *Studebaker Service*, a monthly publication for the promotion of universally satisfactory service, has been announced by the Studebaker Corporation of America.

This new publication is devoted entirely to new and most efficient methods of insuring 100 per cent service from Studebaker commercial cars. It deals with every type of commercial car produced by Studebaker. It contains helpful information on the occasional service that is necessary to any automobile and how such service may be rendered in the most efficient manner.

In the first issue of the commercial car edition there is a wealth of material that will benefit the operator and the service manager who are interested in commercial cars. There are expert discussions of "How to Order Parts," "Care of Valves," "Bus Chassis Loads," "Ordering Bus Chassis Springs," "Touch Up Outfits for Lacquer," "Keeping Cars on the Road" and a number of other articles that contain valuable information.

2½-In. Paving Brick Again Recognized

Taking cognizance of an increase in shipments of 2½-in. paving brick from 31,802,533 in 1925 to 58,468,007 in 1926, the permanent committee on simplification of variety and standards for vitrified paving brick of the Department of Commerce of the United States, at its meeting in Washington March 31, reinstated this size in the list of recognized types and sizes.

The revised list of recognized types and sizes of vitrified paving brick as determined by the committee and the percentage of total shipments represented by each size is as follows:

	Per Cent
PLAIN WIRE-CUT BRICK	
2½-in. x 4-in. x 8½-in.	14.1
3-in. x 4-in. x 8½-in.	38.2
3½-in. x 4-in. x 8½-in.	5.9
REPRESSED LUG BRICK	Per Cent
4-in. x 3½-in. x 8½-in. Wire-Cut L,,	14.5
WIRE-CUT LUG BRICK	Per Cent
4-in. x 3½-in. x 8½-in.	6.4
	79.1

NOTE.—Remainder of 20.9 per cent made up of special sizes or types not included in recognized list.

The survey of the industry, made by the United States Department of Commerce to serve as a basis on which the simplification committee annually makes its decisions, revealed a big increase in total shipments of paving brick for 1926 over 1925. Total shipments for 1925 were 353,588,777. Those for 1926 were 413,125,469, or a gain of 59,536,692 for last year. The 2½-in. brick was the only size showing a notable gain in percentage of total shipments, representing 8.9 per cent in 1925 and 14.1 per cent in 1926.

New Reo Line to Be Announced

Two new bus chassis are to be announced by the Reo Motor Car Company, Lansing, Mich. Because of the company's announced decision last January to discontinue bus bodies from the line and because right now the company is between "hay and grass" so far as old and new models are concerned, it has been rumored that Reo has abandoned the bus field. This the company denies. An announcement of interest will be made within the next few months. During the last four months Reo has gone right on delivering bus chassis. Greater Reo values and more advanced designs are ahead and a new field said to have been neglected until now by the bus manufacturers will be developed at the same time that Reo's present field is exploited.

Economic Conference Opens in Geneva

American Delegation Prepared to Help Europe, Not to Attempt to Tell It What to Do to Restore It to Full Industrial Vigor—Stout Defense, if Necessary, of Position of This Country

THE first four days of the International Economic Conference at Geneva, opened on May 4 with 47 countries, including Soviet Russia, represented by delegates, were devoted to a survey of the world's economic ills. There was general agreement that increased production was the indicated remedy, thereby increasing purchasing and consuming power and raising the standard of living. A striking note was the general solicitude for the wellbeing of workers, which was probably a new idea with European employers. In the opinion of W. T. Layton, editor of the *Economist*, a new equilibrium must be established, due, first, to the great increase of industrialization; second, to the fact that the United States is now a creditor nation, but apparently does not desire to buy from the countries she finances, contrary to the policies of former financing nations; third, to the decrease of European emigration; and, fourth, to the alteration of trade relations resulting from the payment of reparations and international war debts. The situation is more acute because Russian imports are small and Central Europe is divided by high tariff walls, resulting in duplication of industrial plants and preventing specialization, which is the essential feature of modern industrialism.

E. J. Mehren, in attendance at Geneva for the McGraw-Hill publications, cabled that Mr. Layton's insistence that the tariff walls of Central Europe must be lowered was approved by numerous speakers. There also was general approval of tariff stabilization regardless of the level, thus encouraging long-time contracts, uniform tariff classification and nomenclature. Long-time commercial treaties were advocated. There was no reference to American tariff rates, but several indirect references to our prohibition of immigration. Financing of backward countries was urged to stimulate production.

Seeing Is Believing

Remember to have your exhibit at Cleveland, when the

A.E.R.A. Meets in October

Reserve Your Space
Between May 16 and June 15

Dr. Carl F. Von Siemens of Germany criticised government intervention in industry, which was particularly interesting as coming from the representative of a country where government assistance and compulsion are considered normal. Zimmerman of Holland cited increased government services and restrictive labor legislation as increasing the industrial burden by raising prices, restricting consumption and reducing trade. The remedies suggested were removal of government interference and reduction in number of non-productive public servants. Only Shidachi of Japan and Layton of Great Britain cited the wastefulness of armaments.

The speech of Henry M. Robinson, chairman of the American delegation, was well received. He sketched the development of our prosperous industrial situation, stressing the determination of American employers to secure needed economies by better management and machinery, but not by wage reduction. He affirmed the American belief that competition stimulates industrial progress and suggested that the American delegation would probably disapprove of international cartels if governments participated or if they were exploitive in character. Answering Sir Max Muspratt of England, who thought that rubber restriction bore equally on every one, Mr. Robinson contented that there was discrimination against America, which uses 75 per cent of the output, as against only 7 per cent by Great Britain.

It is not expected that the conference will have great or important immediate results, but that it will contribute to a better understanding of international problems and will lay a basis for some definite actions now and in the future. Three speakers advocated permanent organization for the study of international economic problems. The plenary sessions closed on May 7, and committee sessions on commerce, industry and agriculture began May 9.

Sokolnikoff of Russia painted an optimistic picture, declaring that industrial and agricultural production are now in excess of pre-war outputs, but the figures are doubted at Geneva. He made a plea for closer capital and trade relations, contending that the capitalist and socialist systems can work harmoniously together. He protested the boycott of Russia.

Obolenski Ossinski of Russia criticised the capitalist system severely, declaring it to be the cause of the World War. He condemned cartels and repeated Sokolnikoff's plea for trade relations, emphasizing the importance of the Russian market. In conclusion he offered eleven suggestions for restoring world trade and prosperity:

1. Cancellation of war debts.
2. Increase industrial wages.
3. Eight-hour day for all workers except miners, who should have six.
4. Fullest liberty for trade union organization and complete liberty for strikes.
5. Relief for the unemployed.
6. Raise funds for the unemployed by taxation.
7. Decrease unproductive expenditure, especially for armaments.
8. Abolish barriers against immigration.
9. Cancel protectorates and mandates and permit self-determination for all peoples.
10. No intervention in China.
11. Suspend economic boycott on Russia and extend credits to that country.

In a cable received from Mr. Mehren dated May 9 he refers to transactions in the various committees on commerce, industry and agriculture. Henry M. Robinson, the American member of the industry committee, told the delegates that there was no excuse for America to discuss general conditions except objectively. This was in response to doubts that American methods were suited to European conditions. Both questioners admitted that waste prevention and increased output were desirable and added that the interchange of methods and practice among industrial firms would be advantageous. The substitution of mechanical equipment for hand labor was considered not immediately possible due to extensive unemployment. Figures on the latter were considered uncertain, inasmuch as 1923 American estimates from two sources varied three million to five millions, with discrepancy not yet discovered. Peyerimhoff of the French coal mines committee eulogized the social harmony prevailing in America and requested information as to how this was obtained. He recognized the fact that class conflict is non-existent in America and showed an excellent understanding of American conditions. He said that Europe is seeking a cure for its ills by first obtaining financial stability.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	May 10, 1927
Copper, electrolytic, cents per lb	12.775
Copper wire, cents per lb	15.125
Lead, cents per lb	6.73
Zinc, cents per lb	6.50
Tin, Straits, cents per lb	68.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	2.175
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.50
† Quotations withdrawn because of strike	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.625

Copper, at 13 Cents, Comes to Life—Other Non-Ferrous Metals Quiet

COPPER sold in large volume during the week ended May 11, 1927, with prices almost uniformly at a firm 13 cents delivered basis, says *Engineering and Mining Journal.* Little business was reported in tin and lead was only moderately active. Zinc was in good demand and exhibits a somewhat stronger tendency than lead, in spite of a further reduction in ore prices at Joplin. The platinum market continues demoralized, with further important reductions in price.

With large buying by the leading consuming interest, copper became suddenly active on May 6 and a good business followed, though on May 11 there was perhaps a little cessation in the inquiry. Most of the buying has been by consumers in the East, including an occasional order from a wire mill, and the price has been almost uniformly 13 cents delivered. In the Middle West an occasional order has been placed at 13⅛ cents, but sellers have found a disinclination to pay that much, and it seems likely that copper—perhaps Michigan copper—has been offered to Middle Western consumers at close to 13 cents. There is some talk of advancing quotations to Eastern consumers to 13⅛ cents, but apparently no one has yet taken that step.

Most of the orders placed have been for June shipment, with a liberal quantity for July, and an occasional request for May and August. All are quoted at the same price. Foreign business has picked up markedly, and the export association has been limiting the amount sold. The export price is unchanged at 13.33 cents, c.i.f.

The zinc market has been more active than for seven weeks with practically all business at either 6⅛ or 6.15 cents, St. Louis, though some was sold as low as 6.10 cents. Zinc generally is in strong hands. Though stocks increased last month, it is felt that production will be curtailed to accord with the demand, especially now that ore in the Tri-State district has dropped below $40 a ton, and that further price reductions are unlikely.

Statistics of the American Zinc Institute, in tons of 2,000 lb., follow:

Stock, April 1	36,279
Produced	51,626
Shipped	46,697
Stock, April 30	41,208
Shipped from plant for export	1,876
Total retort capacity, April 30	136,644
Number idle retorts available within 60 days	57,297
Average number of retorts operating during April	81,582
Number retorts operating April 30	81,096

Little change had taken place in prices for lead in either the foreign or domestic markets during the week ended May 11. The American Smelting & Refining Company maintained its official contract price at 6.75 cents, New York, and 6.40 cents was the prevailing figure in the St. Louis market. Occasional lots were sold at prices from 2½ to 5 points below these, but the total tonnage at cut rates was not large. Despite the fact that Mexican ore lead is all going abroad, prices in London have been well maintained. A significant feature in the domestic market is that practically all of the moderate volume of business is for May shipment. This indicates "hand-to-mouth" buying in an unusual degree and suggests that one of the periodic buying waves may start if and when consumers reach the conclusion that the bottom of the market has been reached. On May 11 600 tons of antimonial lead arrived in New York from the Burma mines in India. It is believed that this is low-grade material sent here for refining.

On May 5 it developed that very little Straits tin for prompt shipment was available in the domestic market. The price jumped more than a cent, though it was largely nominal. Subsequently some consumers postponed delivery on early contracts, thereby releasing sufficient nearby metal to supply the meager requirements of consumers. The spread between Straits and 99 per cent is particularly wide because of the fact that an ample supply of the lower grade metal from England is afloat.

$200,000 Bus and Rail Terminal in Michigan City

Contracts have been awarded for the construction of the new union passenger station to be used jointly by the Chicago, South Shore & South Bend Railroad and the Shore Line Motor Coach Company, a subsidiary, at Michigan City, Ind. The cost of the station, together with an adjoining garage which will accommodate 40 motor coaches, will be more than $200,000. It will be a two-story structure with offices for operating officials of the motor coach company on the second floor.

Additional ground near the station has been purchased to provide loading facilities for the motor coaches. A steel-covered canopy will be built leading from the station and covering one-half of the loading area to protect passengers in case of inclement weather.

The interior of the station will be tastefully decorated and comfortably furnished. Adequate accommodations for refreshments will be provided through the installation of a counter where light lunches and drinks will be served. The front of the building will have two large full-length plate-glass windows on either side of a double door.

Because of a special arrangement by

which Shore Line Motor Coach passengers may ride on the high-speed trains of the South Shore Line between Michigan City and Chicago—at their option—Michigan City has become an important transfer point. Motor coaches of the Carey and Leach Bus Lines, Inc., operating between Detroit and Chicago, also will use the new station as their Michigan City headquarters.

The station will be built by the J. H. Lorenz Company, Gary, Ind., and the garage is under construction by the Austin Company, Chicago.

Fifteen New Cars Urged by San Francisco Citizens

Various civic organizations are now behind the movement for the immediate purchase of fifteen cars for the new Judah Street line of the Municipal Street Railway, San Francisco, the money for which would be taken from a $290,000 budget item for track. In a sense this reopens a matter referred to previously in the ELECTRIC RAILWAY JOURNAL. Back of the movement is Mayor Rolph, who is understood to have agreed to ask the Board of Supervisors to divert from other city funds for the time being the money for the new rolling stock.

Meanwhile delivery of the fifteen cars ordered eight months ago will be completed during the next three weeks.

Virginia Company Rushing Trackwork

Virginia Electric & Power Company is reported as assembling material for the double tracking of its Bay Shore line in Tidewater, Virginia. It is understood also that the company expects to begin work on this improvement and on the construction of the Church Street track, between Eighteenth and 25th Streets, as soon as the Naval Base line has been revamped.

While work on the Bay Shore line will be in full swing this summer, it appears now almost certain that the double track will not be completed until fall and that the heavy summertime traffic to and from Ocean View, seaside resort, will move this year, as it has in the past, over the present main line through Norfolk and Bay View.

With an even break on the weather, completion of the new track on 25th Street and Hampton Boulevard, which will shorten considerably the running time to the Naval Base, is expected before the battle and scouting fleets come to Hampton Roads for their week's visit on May 28.

Rolling Stock

El Paso Electric Company, El Paso, Tex., has placed an order with the American Car Company, St. Louis, for seven 39-ft. 11½-in. single-end motor bodies to be mounted on Brill 177-EX trucks.

Interstate Public Service Company, Scottsburg, Ind., recently placed an order for six interurban cars with the G. C. Kuhlman Car Company. The new cars will be mounted on Brill 177-EX trucks.

Montreal Tramways, Montreal, Canada, received its first new Versare bus May 4, according to advices from the office of D. E. Blair, general superintendent. Tests of the new equipment will go forward immediately.

Galveston Electric Company, Galveston, Tex., has placed an order for four 44-ft. 11½-in. double-end bodies to be mounted on Brill 177-EX trucks.

Brazilian Traction, Light, Heat & Power Company, with offices in Toronto, Ont., is reported as having placed an order for cars with the Canadian Car & Foundry Company of Montreal, Canada. In some quarters this is taken as indicative of active South American trade with the Canadian industry.

Track and Line

Public Service Railway, Newark, N. J., will lay new rails and roadbed along Cass Street, Trenton, N. J.

Pennsylvania & New Jersey Railway, Morrisville, Pa., will extend its lines from Trenton and Morrisville, Pa., to Manor Park and along the Delaware River front.

Atlantic City & Suburban Railway, Atlantic City, N. J., has been requested by the Atlantic County Board of Freeholders to bring its roadbed up to grade along the shore road.

Utah Light & Traction Company, Salt Lake, Utah, is reported as contemplating the expenditure of $350,000 for repairing, replacing rails, new overhead work and new equipment.

Los Angeles Railway, Los Angeles, Cal., has started work on complete reconstruction of tracks on West Washington Street between Estrella and Burlington. The old 60-lb. rail formerly used will be replaced by the new, heavy 116-lb. steel girder rail, of which the first 550-ton unit of a 2,000-ton order placed by the company arrived in Los Angeles harbor on board the S.S. *Felix Taussig*, May 7. This new rail is not only a great improvement from the standpoint of efficient operation, but also is a long step toward smoother and more comfortable riding for the passengers. Replacement of the old rail is also being made on Figueroa Street, between Eleventh and Washington.

Milwaukee Electric Railway and Light Company, Milwaukee, Wis., will spend nearly $800,000 this year in reconstructing tracks and paving in Milwaukee and suburbs, according to a recent announcement by R. H. Pinkley, vice-president. About $35,000 has been spent at Broadway and East Wisconsin Avenue. Two jobs are now under way; one on 35th Street from Wells to State Street, which is estimated to cost $25,000; the second on National Avenue from 22d to 24th Avenue. Other projects scheduled are: Twenty-fifth Street, Clybourn to Park Hill, $38,500; Juneau Avenue, Third to Seventh Street, $30,800; East Water Street, Michigan to Mason, $25,200; Kinnikinnic Avenue, Falling Heath to Ludlow, $38,000; Third Street between Center and Burleigh, $32,000; Center Street, Third to Eighth, pavement only, $15,500.

Shops and Buildings

Indiana Service Corporation, Fort Wayne, Ind., is rumored as having plans drawn for a $250,000 terminal building and offices at Fort Wayne, Ind. The structure is to be built of brick, concrete and steel.

Trade Notes

American Brass Company, New York City, opened an office in the Military Park Building, Newark, N. J., May 2. J. B. Benedict and L. B. Smith are in charge.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been granted permission by the Trenton City Commission to lay a double track on Princeton Avenue.

Van Dorn Coupler Company, Chicago, Ill., reports the recent sale of 400 couplers to the Philadelphia Rapid Transit Company and the placing of an order for 302 couplers for the company's new subway cars.

Moloney Electric Company, St. Louis, Mo., a subsidiary of American Brown Boveri Electric Corporation, New York City, will shortly occupy its new plant in St. Louis, which will permit of increased output to meet its present bookings.

Detroit Stoker Company, Detroit, Mich., announces the appointment of A. Kastello as district sales representative for its eastern Canada and Montreal, Que., territories, with headquarters at 915 New Birks Building, Montreal. Mr. Kastello is a well-known Canadian engineer, having served for many years with different railways in Canada in the capacity of mechanical engineer and power plant efficiency engineer.

New Advertising Literature

Economy Electric Devices Company, Chicago, Ill., is featuring its Economy meters in the four-page folder which is a reprint of an advertisement which appeared in ELECTRIC RAILWAY JOURNAL March 19, 1927.

Acme Electric Heating Company, Boston, Mass., has published a new catalog, series C, complete and revised and possessed of valuable information in the electric heating and resistor field.

Smith Welding Equipment Corporation, Minneapolis, Minn., announces the issuance of its new 1927 junior catalog. It is a convenient pocket size edition, giving prices on and illustrating oxy-acetylene equipment.

Samuel Cupples Envelope Company, New York City, is distributing a circular containing samples of its various envelope products. The mailing piece is especially designed for the convenience of the purchasing agent.

Roller-Smith Company, New York, manufacturer of electrical measuring and protective apparatus with works at Bethlehem, Pa., has recently issued two loose-leaf bulletins describing its type FR relays and type HTD d.c. voltammeters.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 21, 1927 *Number* 21

Master Mechanics Are Leading the Way

IN TWO sections of the country the master mechanics have taken into their own hands the matter of improving their performance. This is being accomplished through the Southern Association of Equipment Men and the Central Electric Railway Master Mechanics' Association. Though working along entirely different lines, the objectives of these two groups are the same, namely, comparison of routine maintenance practices and the stimulation of improved methods.

These men do not come together for ordinary meetings in the usually accepted sense of the term. Their gatherings are actually working conferences and their purpose is to learn from each other. Consequently, there is a benefit to each man which can be applied in his daily work and there is a self-created stimulus toward improvement which is of immeasurable value to the property he represents. There is no better way to arouse ambition in a man's mind than the example afforded by progress on the part of his neighbor.

Both these groups of mechanical men have found a point of common interest which ties them together and furnishes the theme for their meetings. For the Southern men this consists of a continuous comparison of maintenance costs and pull-in records. Regular reports are furnished to a secretary and each member receives a complete record of his standing in comparison with his associates. A truly remarkable improvement in the performance of most of the participating properties has resulted. The Central Master Mechanics' group is tied together by the common problem of interchanging freight equipment. Already its work has resulted in the design of a standard freight car, in the preparation of standard rules for inspection and in considerable progress on a standard set of charges for interchange equipment repairs. It is hard to realize now that these men originally formed their association in the face of executive opposition from some of the properties in the territory!

Nitrocellulose Lacquer Finishes Are Passing Through a Development Stage

SINCE the introduction of nitrocellulose lacquers for painting electric railway cars maintenance men have been extremely interested in the results obtained. The advantages of quick-drying and chemical inertness offer possibilities for reducing the shopping time of cars and increasing durability of the paint that have great economic value. The use of lacquers for painting steel cars is increasing, but there are several problems to be solved which make progress slow. One of the most serious of these is that most of the painting of electric cars is done by placing new paint over the old. The majority of cellulose lacquer manufacturers do not guarantee satisfactory results unless the old paint or varnish is removed completely.

The matching of different shades of color is another problem that has been commented on quite frequently by maintenance men. There seems to be considerably more difficulty in matching a particular color with cellulose lacquer than with the types of enamels and paints commonly used. Lacquer acts quite differently from the usual types of enamels, varnishes and paints used and the spray method of application is necessary. This may cause prejudice among painting forces, which can be overcome only by considerable educational effort, supplemented by improved equipment and facilities adapted particularly for use with cellulose lacquers.

The investigation of painting results made by the equipment committee of the American Electric Railway Engineering Association last year indicated that while many of the cellulose lacquer systems when applied to steel cars had excellent wearing qualities, when applied to wood they gave very unsatisfactory results. It also appeared that there is a wide variation in the qualities and properties of the lacquers of different manufacturers. Railway maintenance men judge all lacquers by the results which they obtain with the particular product they are testing. At present there are 70 or more producers of cellulose lacquer paints and a variation of quality is to be expected quite as great as results from the various oil paints and varnishes. It should be kept in mind that some are sure to prove unreliable, but the success of the entire lacquer principle should be judged by the best results obtained rather than by the failures of inferior grades.

Serious Damage to Pavement Caused by Overloaded Trucks

TIME was when a well-laid pavement lasted many years. No longer is this true. Nowadays pavements often go to pieces before the bonds issued to pay for their construction mature. The reason for this short life, of course, is the widespread use of automotive vehicles. The exact relation between use and wear is of vital interest to those responsible for paving construction, including most of the electric railways, but it is extremely difficult to determine this relation accurately.

Tests made by the United States Bureau of Public Roads show that the impact force of a moving vehicle is much greater than the static load. Hence the design and condition of the springs and tires have a direct

This is the issue in May that is devoted essentially to maintenance and construction subjects

relation to the wear on the pavement. So far as the original design is concerned, it is entirely possible for the public authorities to enforce regulations that will protect the pavement from damage. Methods of maintenance and operation, however, are of equal importance, and are much more difficult to control.

Illuminating figures have been compiled in Connecticut indicating that much damage is due to the overloading of motor trucks. A transportation survey in that state disclosed that among 34,817 trucks actually weighed, 10,523, or more than 30 per cent, were loaded over their rated capacity. The larger trucks were found to be more often at fault than the smaller vehicles. Many carried loads that exceeded not only their own rated capacity but also the maximum legal load of 25,000 lb. Of the total number weighed, 2.1 per cent exceeded this legal maximum.

The harmful effect of this practice is easy to understand. Every truck loaded beyond its capacity subjects the pavement to an excessive strain under the treads of its wheels. Those loaded beyond the maximum limit are even more destructive. Few pavements are designed with a large factor of safety, and any load considerably in excess of the allowable limit is likely to cause serious damage.

It is comparatively easy to limit the rated capacity of a truck to a weight that can be carried safely on wheels with any given bearing area. But it is difficult to prevent the loading of the truck considerably beyond that point. Realization is needed of the harm which results from this practice. Electric railways have a large paving investment at stake, and they might well take the lead in a campaign to prevent this needless destruction.

Order and System Are in the Interest of the Individual

ENVIRONMENT plays a large part in the lives of most of us. It would be incorrect to say that we take on the character of our surroundings, but we do tend to reflect their character. The force in a shop headed by a man lackadaisical in his attitude tends to become lackadaisical in its general conduct. The man who turns a steel car wheel should be no less exact about his work and do the job no less expeditiously and expertly than the banker who is putting through a loan that requires an analysis of the financial stability of a borrower. Each man is probably following the bent of his talents, and each should give to the job before him the best that is in him. Does this sound platitudinous? Does it smack of Henty? Let us admit that it does. Was ever anything accomplished without an ideal?

Of course, craftsmanship in an electric railway shop—if such a term may be applied—does not offer the opportunity for the exercise of that degree of skill which would be possible to a man working, say, as a silversmith. Still, each is an artisan in his line. Each should take an equal interest in the work he turns out. All of which brings up the point that the relationship between the employer and the worker is a bilateral one—that it is reciprocal. The responsibility does not rest on the workman alone.

Men do not do good work in a shop that is cold in winter, improperly lighted at all times, poorly ventilated and ill-equipped for the work that is to be carried out in it. This would seem to be so self-evident that the need would not exist to repeat these strictures against management. Too frequently, however, conditions do exist that militate against a man doing his best. If the management is without pride, soon the men don't care. That is inevitable. In the shop and in the carhouse there should be a place for everything and everything should be in its place. It is possible to be orderly without being fussy. And order makes for the dispatch of work—any kind of work. Shops come to mind that are the last word in appurtenances, and they are the shops in which production is the greatest. This is not a matter of expediency. The man really works hardest who is constantly in a turmoil as to what he shall do next and how he shall go about it. Taylor in his time studies proved this to be the case.

If order and system should rule in the shop and the carhouse, so should it rule with respect to the buildings themselves. The grounds should be kept shipshape. This is easy to do by stimulating interest to that end among the employees. In many instances the shop and carhouse men have been stimulated to greater effort along these lines by competition among them. That is a detail. Where pride alone fails to offer the necessary stimulus, then the task is one that should be formally assigned. Let us achieve these ends by stimulation if possible, but let us achieve them anyway.

Postponement of Depreciation Case Should Not Lead to Neglect

IT WAS good news, indeed, for the electric railway industry when the sub-committee of the depreciation committee, consisting of Ralph R. Bradley, B. W. Warren and Managing Director Storrs, obtained an indefinite postponement of the depreciation hearing before the Interstate Commerce Commission which had been set for May 23. Had the industry been called upon at this time to go through with its hearing the lack of adequate data would have made it extremely difficult to make an effective presentation of the electric railway situation.

Among far-sighted executives it is generally recognized that depreciation must receive adequate consideration by the properties themselves and that on many properties more liberal reserves for obsolescence as well as depreciation must be provided in the future than have been set up in the past. In some few cases, perhaps, inadequate depreciation reserves may be attributed to negligence. But in the vast majority of cases this is not the situation. For a number of years the industry has been faced with the primary problem of meeting its current operating costs and fixed charges. Due to pyramiding costs, on the one hand, and restricted fares on the other, to say nothing of automotive competition that nearly proved to be overwhelming, the principal task of the railway executive for a number of years was to find a way of continuing operations on almost any basis. When one reviews the list of receiverships during the war and post-war years it is not surprising that some properties did not adequately take care of their depreciation.

Now that the industry is fast coming out of the doldrums, under service-at-cost franchises and a more liberal public policy regarding transportation fares, it is important that the rate of fare be determined with an adequate regard for the needs of both obsolescence and depreciation. But the fixing of an arbitrary and inflexible requirement by the commission at this time for setting up depreciation reserves would have set back the entire electric railway industry just when it is beginning to work out its salvation.

Postponement of the hearing by the Interstate Commerce Commission is therefore a welcome respite. It is important, however, that this should not lead to neglect by the industry of so important a matter. The commission's action merely allows more time for adequate preparation of the electric railway case. This the depreciation committee is endeavoring to do. It has a difficult and burdensome task in collecting needed data and is entirely dependent on the co-operation of operating companies. Questionnaires have been sent out for this purpose. Each company called upon for information must do its full part in helping the committee to show why a depreciation order for electric railways at this time is not in the best interests of the properties or the public they serve. Companies whose operations are entirely local in character should be equally interested with those that are interstate carriers, because a ruling by the Interstate Commerce Commission would probably have a very strong effect on the subsequent action of state regulatory bodies. Now that the opportunity is afforded for adequate preparation, it would be extremely unwise to let the matter drag.

Good Patterns Help Reduce Machining Costs

MANY electric railways make their own patterns for certain types of castings and then send them to a local foundry when castings are needed. The castings are machined in the railway company's shops. This procedure usually insures early delivery of the parts needed to return a car to service much more quickly than would be possible otherwise. One great objection to the practice is that sometimes, due to unfamiliarity with foundry practice, patterns are not so designed or constructed that they will produce economical castings.

The importance of high-grade patterns is not confined to the economical production of castings. It includes machine shop costs, expenses of assembly, serviceability of the castings and losses due to rejections, as well as cost and selling price. Patterns constructed properly assist in obtaining better castings, quicker delivery and lower machining costs.

Modern foundries are insisting that patterns be mounted. Nearly all the molding operations, when a loose pattern is used, require hand work, and uniformity is dependent entirely on the skill and judgment of the molder. Mistaken judgment regarding risers may result in shrink holes in the castings, sometimes detected in the foundry, but often not found until considerable machine work has been done. Lack of care in choosing the parting line results in patched molds and castings with improper contour. Excessive rapping of patterns unnecessarily increases casting dimensions and weights and reduces the life of the pattern.

Poorly constructed patterns are likely to warp, which causes dimensional errors in the castings. Loose patterns are subject to more breakage than mounted patterns on account of the molding procedure required. Pattern repairs delay production. Where single castings or very small quantities are used, electric railways frequently consider that the additional cost for a mounted pattern is not warranted, but frequently benefits will result that more than justify it.

In days preceding the present keen competition and intensive production foundries accepted any kind of pattern equipment which might be furnished. As cost and production were of minor consideration, judged by our present standards, castings accepted as satisfactory were produced from such equipment. These conditions have changed, and the fact that foundries have developed improved methods of making castings which necessitate new standards for patterns is an illustration of progress.

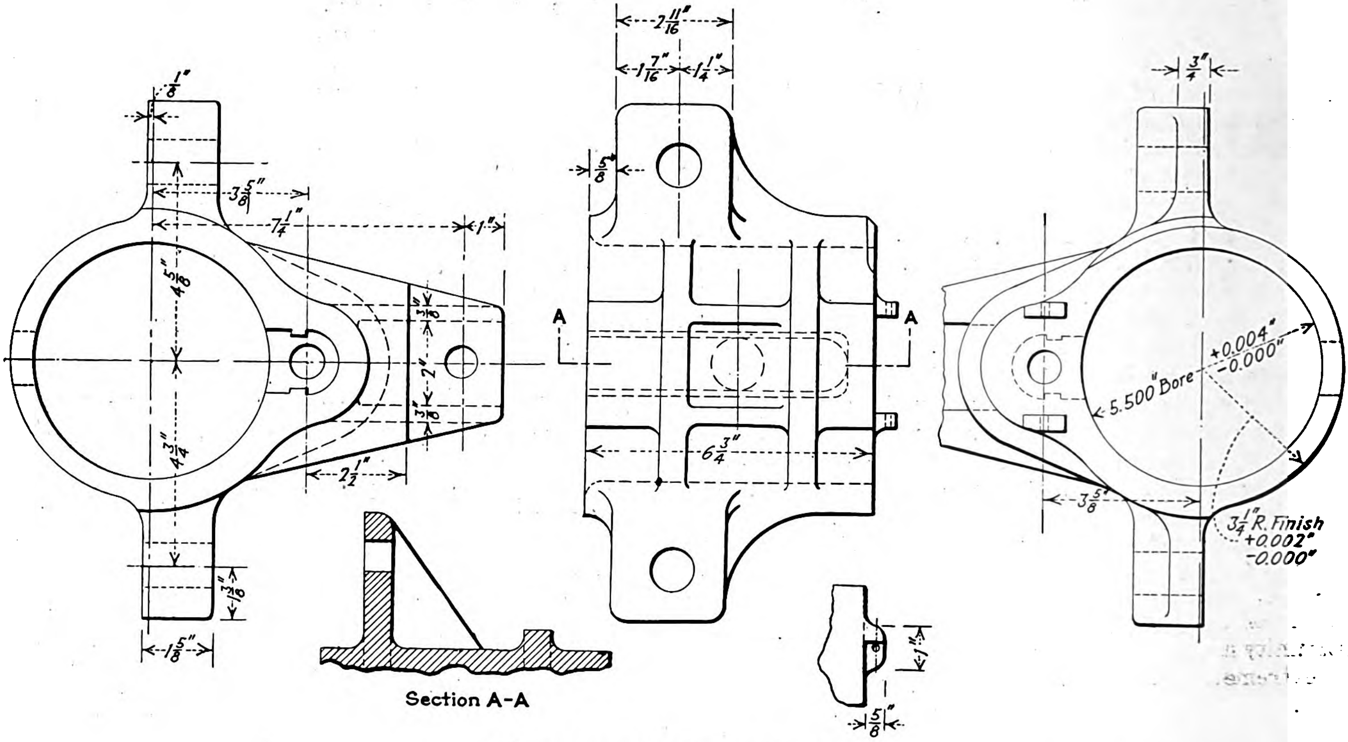
Why Not March Along the Hypotenuse

WHEN the German army tried to crush the British on the retreat from Mons, it made the fatal mistake of marching along two sides of a triangle when it could have intercepted the column of the "Old Contemptibles" by marching along the hypotenuse. While it is a far cry from the strategy of Von Kluck in 1914 to the deliberations of the purchases and stores committee of the A.E.R.A., nevertheless we may gain much from a comparison. To wit: During a discussion on May 16, 1927, of the sub-committee's report on the tracing and expediting of ordered material, W. E. Scott of the Philadelphia Rapid Transit Company made a constructive and telling argument against the long-accepted practice of the purchasing department being the official "tickler" for the tardy vendors.

In other words, Mr. Scott proposed that the stores department, after placing its requisition with the purchasing department, make direct contact with the vendor to expedite delivery, thereby eliminating the work of several clerks, to say nothing of proving that a straight line is the shortest distance between two points.

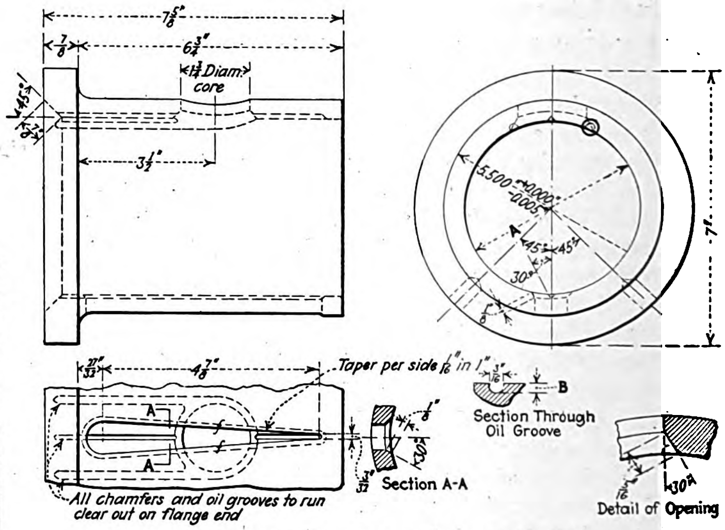
Although with one exception, that of C. A. Harris of the Philadelphia Company, the committee was against Mr. Scott's proposal, he nevertheless made such a conclusive argument that Chairman Fleming suggested that Messrs. Scott and Harris prepare their arguments in the nature of a minority report for discussion at the coming annual convention of the association.

Chairman Fleming undoubtedly acted wisely in taking this means of developing a minority viewpoint. Any method, no matter how radical, that will cut the red tape that is prevalent in all business; that will speed up the selling of popular transportation, should surmount all precedents, no matter how long such precedents have been established. While Mr. Scott's proposition may have some very practical objections from the purchasing department's viewpoint, it seems worthy of serious consideration. In the handling of important contracts it may be better for the purchasing department to follow the matter of delivery. But in many cases this is now done directly by the department for which the order is placed, particularly when that department handles the matter of inspection during construction, as in the case of an order for new cars. In following delivery of the large volume of miscellaneous material that is purchased during the year, therefore, there seems to be merit in Mr. Scott's contention that the stores department is the logical agency for maintaining contact with the vendor. In this age of efficiency and short-cuts none of us want to march along two legs of a triangle when we can accomplish our purpose by treading the hypotenuse.



2 11/16"
1 7/16"
1 1/4"
1/8"
5/8"
3/4"
3 5/8"
7 1/4"
1"
4 5/16"
4 3/4"
3/16"
2"
2 1/2"
3/16"
1 5/8"
A
A
6 3/4"
5.500" Bore +0.004" -0.000"
3 5/8"
3 1/4" R. Finish +0.002" -0.000"
1"
5/8"
Section A-A

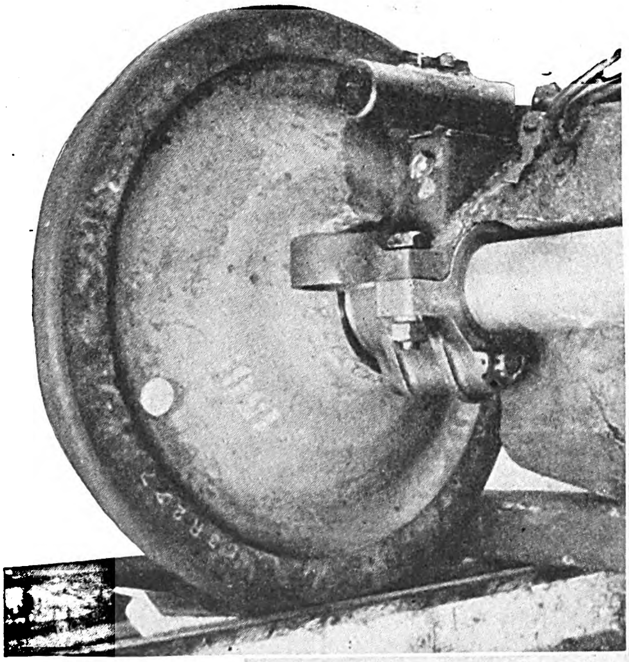
Wedge key axle bearing housing

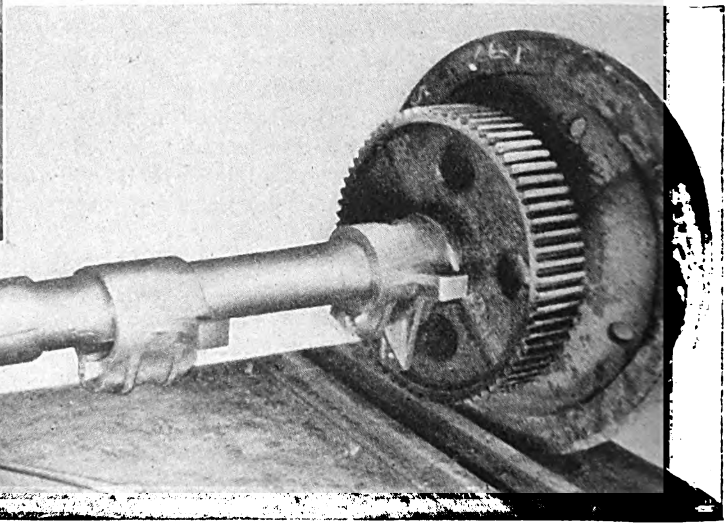


7 5/8"
7/8"
6 3/4"
1 1/4 Diam. core
45°
3 1/2"
7"
5.500 +.0000 -.0005
A
45°
45°
30°
27/32"
4 7/8"
Taper per side 1/16" in 1"
3/16"
B
A
A
1"
30°
Section A-A
Section Through Oil Groove
All chamfers and oil grooves to run clear out on flange end
Detail of Opening
30°

Details of axle bearing used with wedge-type housing

Below, wedge-type axle bearing housing in place on truck

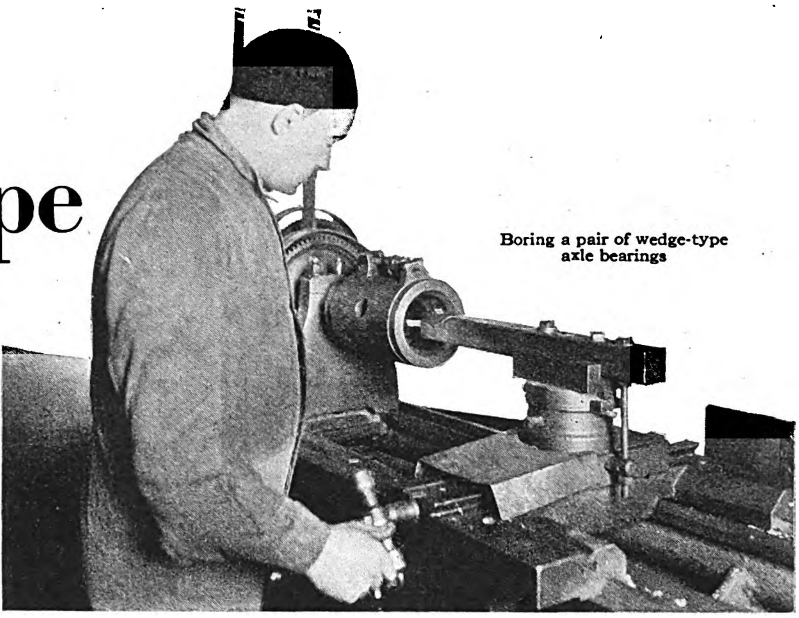




At right, the housings are placed on the axle before wheels are installed

Housing Type Bearing

Adapted for Axles



Boring a pair of wedge-type axle bearings

Wedge type axle bearings used by the Third Avenue Railway, New York City, make accurate fits easy to obtain and, due to the tight fit of bearings in their housings, wear, with its resulting noise and trouble, is reduced

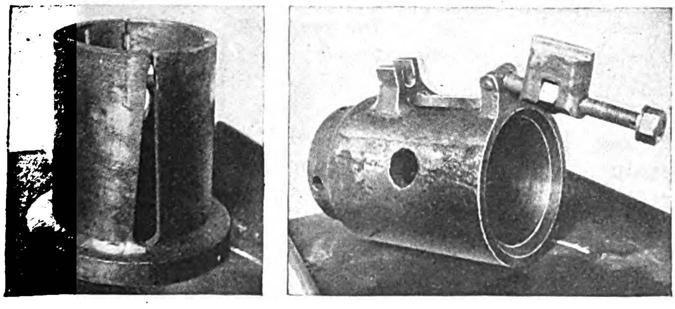
OBTAINING accurate fits for railway motor axle bearings has always been difficult on account of the type of construction used. In order to place them on an axle they must be of a split type. Even though the inside bore fits the axle accurately, when used on old motors there is sure to be found some wear in the axle bearing fit of the motor frame. If the original movement be ever so slight the bearing will be subjected to blows of impact which are destructive and soon cause rapid wear and looseness of fit. Due to the wear of axles in service, the bearing fits are of widely varying sizes. Where axle bearings are carried in stock with bores arranged in steps to fit different diameter axles the workman is supposed to pick one that fits best, but usually he picks one that fits easiest. As a result, bearings start off with a poor fit.

To overcome the troubles which result from improperly fitted axle bearings, J. S. McWhirter, superintendent of equipment of the Third Avenue Railway System, New York, has developed a new type of axle bearing which is now being marketed by the Waugh Equipment Company. These bearings have been applied to the GE-210 and Westinghouse 56 types of motors operated by the Third Avenue Railway, and it is planned to adopt them for all other motors operated by the company.

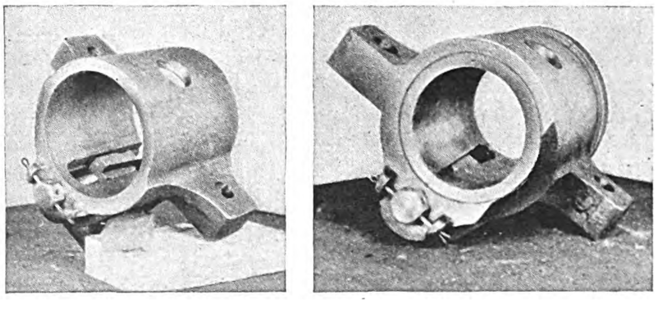
In the construction of this bearing a wedge-shaped piece of nickel steel fits into a corresponding wedge-shaped space at the split of the two halves of the axle bearing. The wedge can be drawn up or loosened by means of a screw, and so the bearing liners are forced tightly against the inside bore of the axle bearing housing which takes the place of the axle cap on the motor. Accompanying illustrations show the details of construction.

The axle bearings are made of bronze and when finished have a ½-in. wall. The opening for the wedge is 4⅞ in. long and each side has a taper of 1 to 16. The large end is 43/64 in. wide and the narrow end 1/16 in. The wedge has an upper section 1.23 in. wide by 1⅜ in. high that fits into a correspondingly sized opening in the housing. This upper section of the wedge is tapped for a ¾-in. stud, which when turned draws the wedge back and forth in the slot in the housing and forces the axle liner tightly into the housing bore. The wedge also serves as a key to prevent turning of the bearing relative to the housing.

The general construction of the housing is similar to that of the axle cap which it replaces, but it is made solid, the thinnest section of the wall being ½ in. On motors having cast-iron babbitted axle bearings there is room for the new housing with ½-in. bronze

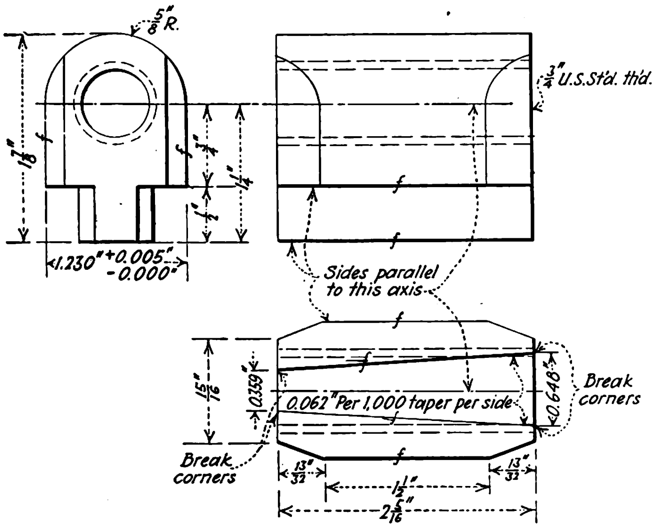


At left, a pair of finished axle bearings ready for installation. At right, type of chuck used for boring wedge-type axle bearings



At left, housing for wedge key axle bearing. At right, bearings in place in axle housing. Screw for tightening wedge at bottom bearings. The Westinghouse 56 motors to which this has been adapted had cast-iron babbitted axle bearings and no additional work was necessary on the motor shells. The GE-210 motors have bronze axle bearings, so it is necessary to rebore the axle bearing fit of the motor shells to ½ in. larger radius to accommodate the new housing.

Since the housings are solid, it is necessary to place them on the axle before wheels are pressed on. This is no disadvantage, however, since the life of the housings is several times that of a pair of wheels, and new bearings can be installed as easily as with the previous arrangement. The housings are bolted to the motor frame with the same bolts that formerly held the axle caps, so no additional drilling and tapping is needed.



Type of wedge key used. This is made of nickel steel and fits accurately the corresponding space in the bearing

Particular care is taken in the various machining operations to make certain that accurate fits will result when the bearings are installed. The two halves of the axle bearing after being finished on the outside are placed in a wedge chuck for boring. This chuck is essentially a housing of the type that will be used with the bearings. With the bearings inserted, the wedge is drawn tightly so the bearing is expanded into position. The chuck is screwed to the lathe headstock and the boring is done with a bar attached to the lathe carriage. With this set-up for boring a fit is assured that will remain the same after the bearing is installed in its housing. Each bearing is fitted to the axle with which it is to run, the inside bore for new axle bearings being 0.015 in. larger than the axle diameter.

The practice of the Third Avenue Railway is to install all bearings at the general overhauling shop. The work is then done by experienced men and is taken out of the hands of inexperienced carhouse men. The installation is very simple; with the housings on the axle the bearings are pushed in and the wedge is drawn. The wedge screw is kept from turning by a cotter pin which passes through the housing and head of the bolt. The housings are bolted into position the same as the ordinary axle cap. Dirt is prevented from getting into the end of the bearings by counterboring the wheel hub so that it forms a permanent dust guard for the bearings.

Overhead Fixtures Inspected on a Car-Pass Basis in Cleveland

By Determining the Number of Car Movements that Can Be Allowed Safely at Points of Severest Service a Maximum Is Established for that Particular Line

By Angus Scott
Assistant Superintendent of Overhead Lines,
Cleveland Railway, Cleveland, Ohio

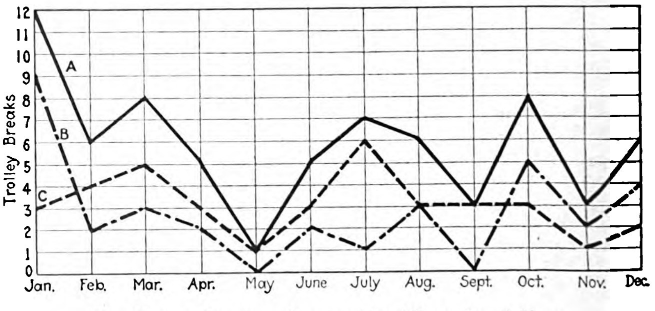
Excellent results have been obtained from the method of inspection and maintenance of trolley wire fixtures used by the Cleveland Railway, which sets a definite number of car movements as a basis. For ears the number of car movements is established at a point just ahead of car stops where they receive the severest usage. Figures will, of course, vary with different localities, types of material and the equipment running over the lines. The figure that is now being used in Cleveland is 60,000 car passages. When this number of car movements has been covered on a line, a crew will inspect the fixtures and remove the worn-out material.

Taking, for example, a line which has 240,000 car movements per year, 60,000 passages are registered in three months time. In this fashion a table is drawn up to include every line on the system and the renewal dates are set down, as follows:

Line (Limits)	Movements Per Year	Renewal Span, Months	Renewed	Foreman	Next Renewal Date
Thale Ave.—Hill Street to Date Street.	Eastbound 240,000 Westbound 240,000	Three Three	Jan. 1 Feb. 1	J. Lee R. Burt	April 1 May 1

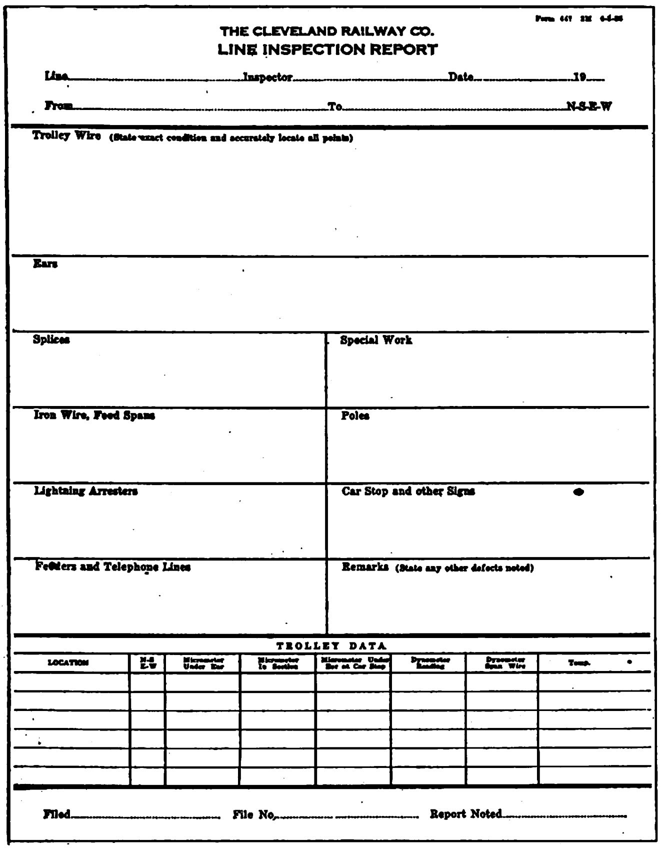
The fixtures between the car stops in the line will of course last the longest. Following this plan, when the utmost life is secured from the material it is removed and a constant inspection of the equipment is maintained quickly and when necessary. Also the points where severe wear is encountered are well taken care of.

The crew going over the line also functions to some degree as an inspection crew. If trolley wire or other equipment is found in poor condition this is noted and reported. Then a specially trained inspector is sent over the area involved. He fills out an inspection report of the type shown in an accompanying illustration, giving micrometer and dynamometer readings. From these data it may been seen readily whether the equip-



Trolley wire breaks on the Cleveland line during the year 1926

C, burnt down and pulled down.
B, other causes.
A, total



Form [illegible]

THE CLEVELAND RAILWAY CO.
LINE INSPECTION REPORT

Line............ Inspector............ Date............19....

From............ To............ N-S-E-W

Trolley Wire (State exact condition and accurately locate all points)

Ears

Splices

Special Work

Iron Wire, Feed Spans

Poles

Lightning Arresters

Car Stop and other Signs

Feeders and Telephone Lines

Remarks (State any other defects noted)

TROLLEY DATA

LOCATION	N-S E-W	Micrometer Under Ear	Micrometer In Section	Micrometer Under Bar at Car Stop	Dynamometer Reading	Dynamometer Span Wire	Temp.

Filed............ File No............ Report Noted............

Form of line inspection report used in Cleveland

ment need be renewed or the amount of life that remains.

Through this method of automatic renewals and inspection the trolley failures on the system have been kept to a low figure. A graph of the breaks and an analysis of them for the year 1926 are given. A great many deductions may be made from the graph and causes determined for the increase of trolley failures or breaks in various seasons of the year and at various locations.

It will be seen that graph *A* is the sum of graphs *B* and *C*. Looking at graph *B* it will be noticed that *B* crosses *C* in the month of February and remains below *C* until October, when it again crosses *C* and remains above for the balance of the year. This relationship simply means that the proportion of trolley breaks due to failure in the wire or fixtures shows up in the months when the weather is coldest. Thus when the first cold spell comes in the fall graph *B* reaches a peak in October.

On the other hand, the number of burn downs is shown to be at a maximum during the fair weather months when track and building activities in all lines are at their height. Graph *C* reaches a peak in the month of July. Studying this graph along these lines discloses other subjects on which desired information readily may be secured.

TROLLEY BREAKS FROM ALL CAUSES, 1926

Worn wire	19
Defective fittings	2
Burnt spot	2
Crystallization	6
Flaw in wire	3
Worn fittings	1
Burnt down by foreign shovel	5
Burnt down by Cleveland Railway shovel	2
Burnt down by Cleveland Railway grinder	1
Burnt down by Cleveland Railway welder	1
Burnt down by Cleveland Railway wires	3
Burnt down by foreign wires	11
Burnt down by foreign cars	4
Burnt down by Cleveland Railway cars	7
Pulled down by Cleveland Railway cars	3
Total	70

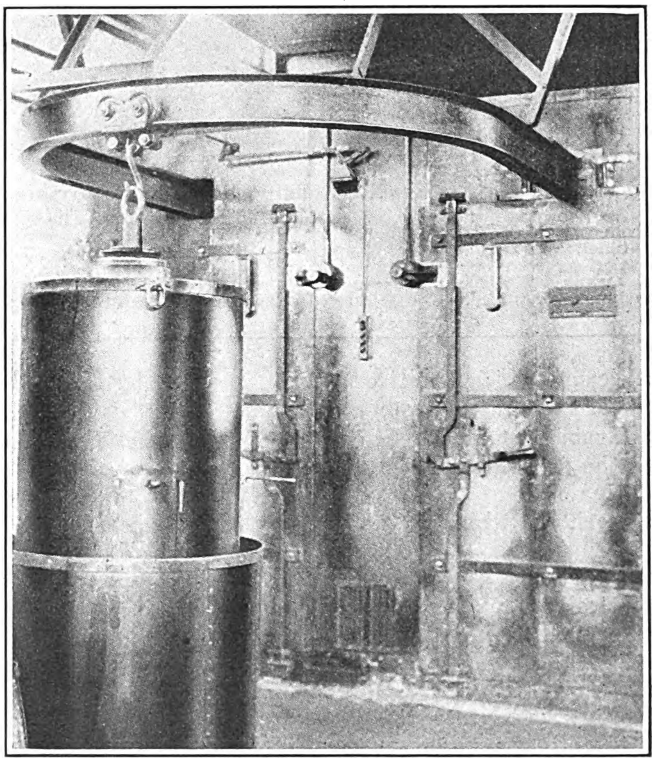
LOCATION OF TROLLEY BREAKS

Due to worn wire:	
In section	3
At end of ear	3
Under ear	9
Under structure	2
At end of splice	2
Total	19
Due to crystallization:	
At end of section insulator	3
At end of crossing	2
In curve	1
Total	6

Handling Armatures on Monorail System

Entire Process of Cleaning, Dipping and Baking Carried Out While They Are Suspended by Eyebolts from the Trolley

REWOUND armatures on the Los Angeles Railway are transported on a monorail system through the various stages of final finish, including dusting, dipping and baking. The armature is suspended from the monorail carriage by an eyelet which is screwed into the commutator end of the armature shaft. For the purpose all armature shafts on this property are drilled out at the commutator end and tapped for a $\frac{5}{8}$-in. standard machine screw. The eyelets, made in the shop, are

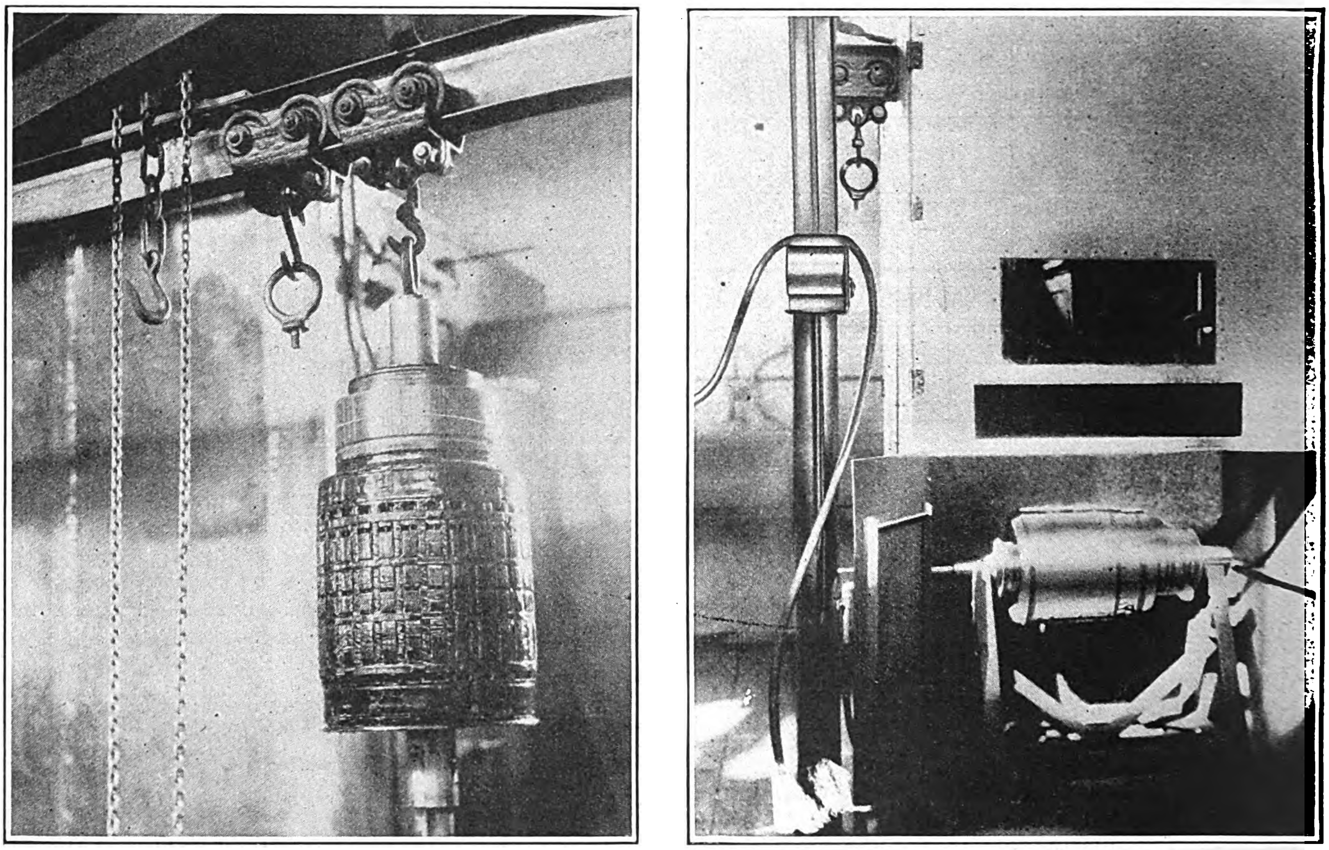


Monorail system used to handle armatures

From the preheater oven, on the right, the monorail conveys the armature on a curved piece of track to the main heater, on the left. Between the two heaters is the dipping vat, which is raised by hydraulic pressure to submerge the armature.

forged out of ¾-in. round steel to an inside diameter of approximately 3 in.

After the armature is repaired or rewound it is transported on its carriage truck to the monorail system, where it is raised by a ½-ton differential hoist to the monorail carriage. First, the armature is run into the cleaning cabinet. An opening in the side of this sheet metal cabinet permits the operator to play air at a pressure of 90 lb. on the suspended armature. This removes the dust and dirt from the crevices in and around the winding. The air is exhausted from this chamber by a blower fan which carries the air through a cleaner which removes the dust and dirt by means of water running over screens.



Handling equipment used for armature cleaning, dipping and baking operations

As shown in the view at the left, armatures are suspended from a carriage on a monorail system and conveyed to cleaning cabinet, preheating oven, dipping vat and main heater. The eyelet screwed into the commutator end of the shaft serves as a means of raising the commutator to the carriage, where it is hooked in place. The ½-ton differential hoist is shown.

The illustration at the right shows how armatures are first cleaned in a cabinet, where air at 90 lb. pressure is played upon them. An opening in the cabinet enables the operator to insert the nozzle of an air hose to blow off dust and dirt. This armature has not been raised to the conveying monorail carriage, but is resting on its work dolly truck.

From the cleaning cabinet the armature is conveyed to the preheater, which is an oven capable of accommodating four of the large size armatures. It has doors at each end which permit the armatures to be run in on the monorail. A temperature of 205-deg. F. is maintained in this oven by electric heating coils thermostatically controlled. After twelve hours of preheating the armature is removed, progressing to the dipping vat, where the insulating compound is applied. The monorail makes a complete 180-deg. curve out of the preheating oven into the first and second main ovens. Midway between the preheater and main heater on the monorail is the dipping vat. In this particular installation the vat, with 50 gal. of Sherwin-Williams black Ajax compound, is raised approximately 3 ft. by means of a hydraulic ram. The movement of the ram is controlled by both intake and release valves, so that the height of the dipping may be closely controlled. Before the armature is submerged in the insulating compound a sleeve is placed over the lower end of the shaft to protect it. This sleeve is of such length as to inclose the entire shaft. It is held in place by three springs on the inside which grip the shaft close to the armature spider and hold it securely.

The armature is submerged for approximately two hours, after which the vat is lowered and the armature allowed to drip for a few minutes before being conveyed into the heater. A small pan is hung beneath the armature as it goes into the main heater to catch the drippings.

Each main heater will hold eight armatures and is electrically heated with automatic thermal control to a temperature of 205 deg. F. The armatures are baked in these ovens for 48 hours. A feature of these ovens is the automatic shut-off of power. A control button placed adjacent to the door is actuated by a projecting arm and pointer mounted on the door. When the door is closed the button is depressed and the power turned on. When opened the button is released and the power shut off. This prevents accidents which might result should an operator enter the oven with the power on.

With this system of cleaning, dipping and baking the armature room has an output of one armature every three hours.

Maintaining
Proper Gear-Center Distances*

By P. A. Pontius
Renewal Parts Engineer
Westinghouse Electric & Manufacturing Company

With modern types of railway motors there are ten surfaces where wear will cause spreading of gear centers. The minimum desirable wear for these surfaces is given

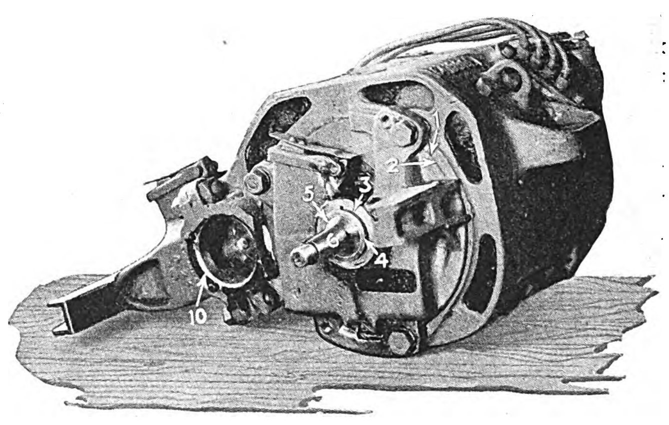
WHEN a railway motor is put in service the gear-center distance is as close as commercially possible to the mathematical dimension specified between the center of the armature shaft and the center of the gear axle for which the motor has been designed. This close fit will be lost more and more with the increased wear of different motor parts. The wear of any or all of the following ten surfaces will affect the gear-center distance: (1) Housing seat in the frame, (2) frame seat on the housing, (3) armature bearing seat in the housing, (4) outside of armature bearing, (5) bore of armature bearing, (6) shaft, (7) axle, (8) bore of axle bearing, (9) outside of axle bearing and (10) axle bearing seat in frame and axle cap.

The first question in the state of evolution of all motors in service is undoubtedly the following: "What is the allowable maximum wear on these different surfaces, i.e., how much wear may be allowed before taking the motor out of service for repair?" This question will be answered in the following for each of the ten surfaces in subsequent order:

No clearance should be allowed between surface 1, housing seat in the frame, and surface 2, frame seat on the housing. A greater allowance than metal to metal fit should always be available; that is, the exact diameter of the housing should always be greater than the fit in the frame. The housing should in no case be loose in a box-type motor and a split-type motor should not be allowed in service if the housing is not clamped tightly enough to keep it from moving in its seat.

If the bolts are kept tight with proper fits, there should be no wear. If the housing is once loose, the wear will increase rapidly, and the housing bolts will tend to work loose and considerable bolt breakage may result. Usually an improved bolt material can prevent, but not eliminate entirely, this breakage. The extensive wear will soon demand a very costly repair of the frame and housing or necessitate a new housing, besides the expense for new and high-grade bolts and the trouble caused by bolt breakage. If the motor is withdrawn from service in due time the comparatively inexpensive repair of the housing only may be necessary. The time for those repairs will be less. Thus the equipment soon can be again on the road, increasing the revenue per car. The total number of cars necessary will be less to maintain a given schedule if the time for repairing the cars and motors is reduced.

Between surface 3, armature bearing seat in the housing, and surface 4, outside of armature bearing, no clearance should be allowed. The metal fit should be such that the bearing is kept in the housing without additional help of the key. The key should be considered as an additional safeguard only to prevent the bearing from turning should it work loose on the road, as a loose bearing may turn so far that the bearing shell closes up the oil opening in the housing, depriving the bearing of the necessary lubrication so that a hot bearing would undoubtedly follow. If the bearing is loose in the housing the established clearance will increase rapidly, as the pounding action of the motor will reduce the outside of the bronze shell and the keyway in the housing will wear. The use of steel bearing shells to reduce the rapid wear on the outside cannot be recommended. Bronze shells are necessary in order to have the additional wearing surface for the armature shaft if the babbitt lining should melt out from hot bearings.



There are ten surfaces subject to wear which affect the gear-center distance

1. Housing seat in frame. 2. Frame seat in housing. 3. Armature bearing seat in housing. 4. Outside of bearing. 5. Bore of armature bearing. 6. Shaft. 7, 8 and 9 are not shown in the illustration. 7. Axle. 8. Bore of axle bearing. 9. Outside of axle bearing. 10. Axle cap and frame bore.

However, as soon as the loose bearing is noticed the motor should be taken out of service and repaired before the bearing fit and the keyway in the housing are worn, as this will necessitate a costly and time-losing welding or machining job, or both.

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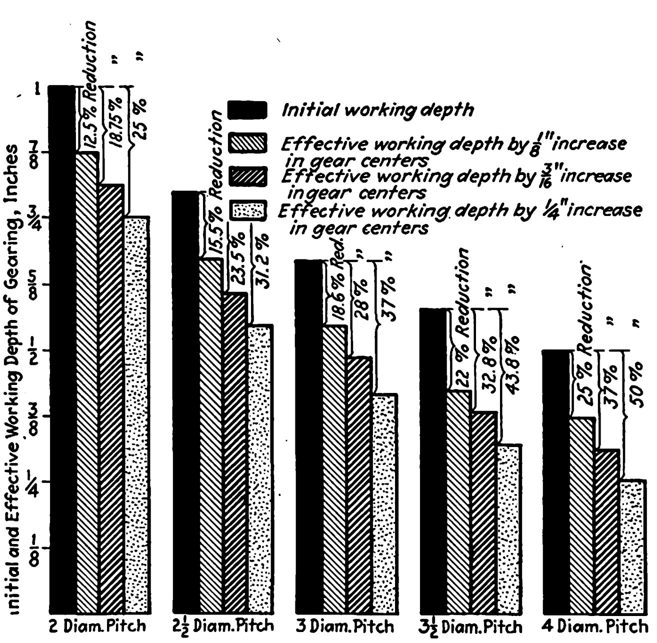
*This is the first of two articles dealing with wear that affects distance between centers of armature and axle shafts.



Reduction of gear mesh caused by increase in gear-center distance and end play

It is recommended that surface 5, bore of armature bearing, and surface 6, shaft, be allowed to wear in service only until there is a total clearance of $\frac{1}{32}$ in. between them. For motors of 50 hp. and above $\frac{1}{16}$ in. is recommended. These close limits on the radial wear are necessary to increase the life of gears and pinions. It also prevents pounding of the armature and wear of motor parts. It eliminates excessive vibration of the armature, reducing wear of commutator, carbon brushes and brush-holders, as well as the breakage of armature coil leads. All these parts will be affected unfavorably by the increased clearance between the armature shaft and bearing bore.

In regard to breakage or wear in the motor caused by interference of stationary parts with rotating parts the maximum total armature end play for motors in service should not exceed $\frac{3}{16}$ in. For motors of 50 hp. and above $\frac{1}{4}$ in. may be allowed. These limits will help to maintain the alignment of the total width of the pinion with the total width of the gear. With reduced armature end play the axial pounding of the armature in the motor will be lessened and interference of the brush-holder with the commutator neck will be eliminated.

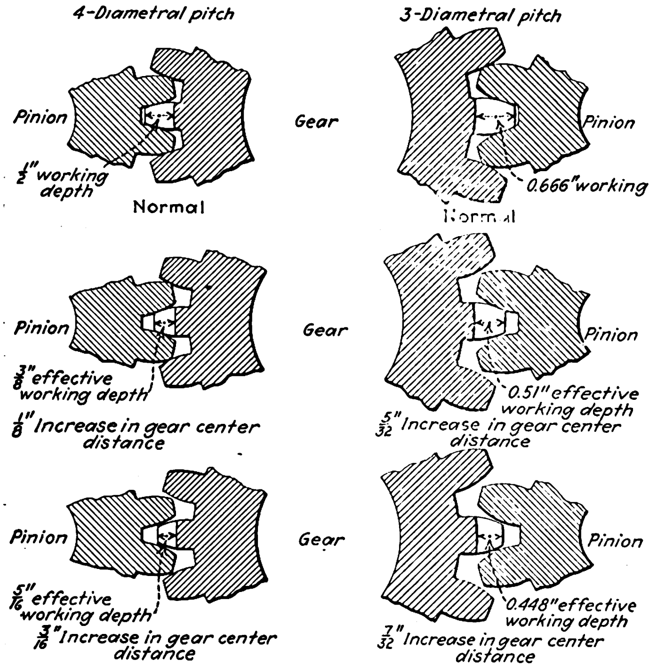
In limiting the total wear of surface 7, axle, and surface 8, bore of axle bearing, the reduction in the mesh of gears and pinions is mainly to be considered. A wear in service should be permitted until $\frac{1}{16}$ in. total clearance between axle and bearing bore is reached; that is, diameter of worn bore minus diameter of worn axle should not be larger than $\frac{1}{16}$ in. for motors smaller than 50 hp. A total wear of $\frac{1}{8}$ in. may be allowed for larger motors.

In addition to the above radial wear it is necessary to limit the motor end play. The maximum total motor end play in service should not exceed $\frac{1}{4}$ in. for motors smaller than 50 hp. one-hour rating. For larger motors $\frac{3}{8}$ in. may be allowed. These limits depend mainly on the clearances between the gear and gear case and other points of interference on the truck. It should not be overlooked that the motor is suspended unsprung on the axle side and shocks of the motor are transmitted through the axle bearing to the axle. These shocks are caused (1) by the vertical pounding of the armature depending on the radial wear of shaft and armature bearing; (2) by the axial pounding of the armature depending on the armature end play; (3) by the vertical pounding of the motor depending on the radial wear of axle and axle bearing, and (4) by the axial pounding of the motor depending upon the motor end play on the axle.

BEARING CLEARANCE AND END PLAY RECOMMENDED AND TOLERATED FOR RAILWAY MOTORS

Recommended maximum reduction of $W \times F$ within 30 per cent.
Tolerated reduction of $W \times F$ within 40 per cent.

Motors with		Clearance Between Points				Increase in Gear-Center Distance				
		5–6 Armature Bearing		7–8 Axle Bearing						
Diameter Pitch	Width of Gear Face	Recommended Maximum	Tolerated	Recommended Maximum	Tolerated	Recommended Maximum	Tolerated	Recommended Armature End Play	Recommended Motor End Play	Reduction of Effective Gear Width
4½	3½	1/32	3/64	5/64	7/64	7/64	5/32	3/16	1/4	[illegible]
4	3½	3/64	1/16	5/64	7/64	1/8	11/64	3/16	1/4	[illegible]
4	4	3/64	1/16	3/32	1/8	9/64	3/16	3/16	1/4	[illegible]
3½	4	3/64	1/16	7/64	9/64	5/32	13/64	3/16	1/4	[illegible]
3½	4½	3/64	1/16	1/8	11/64	11/64	15/64	3/16	1/4	[illegible]
3	4	1/16	5/64	1/8	5/32	3/16	15/64	3/16	1/4	[illegible]
3	4½	1/16	5/64	9/64	3/16	13/64	17/64	3/16	1/4	[illegible]
3	5	1/16	5/64	7/64	9/64	11/64	7/32	1/4	3/8	[illegible]
2½	4	1/16	5/64	7/64	1/8	11/64	13/64	1/4	3/8	[illegible]
2½	5	1/16	5/64	1/8	11/64	3/16	1/4	1/4	3/8	[illegible]
2½	5¼	1/16	3/32	13/64	11/64	13/64	17/64	1/4	3/8	[illegible]


4-Diametral pitch
3-Diametral pitch
Pinion
Gear
Pinion
1/2" working depth
0.666" working
Normal
Normal
Pinion
Gear
Pinion
3/8" effective working depth
1/8" Increase in gear center distance
0.51" effective working depth
5/32" Increase in gear center distance
Pinion
Gear
Pinion
5/16" effective working depth
3/16" Increase in gear center distance
0.448" effective working depth
7/32" Increase in gear center distance

Depth for different spreads in gear centers and for different diametral pitches

These numerous actions of the motor are transmitted to the truck and track, causing wear on all parts affected.

No clearance should be allowed between surface 9, outside of axle bearing, and surface 10, axle bearing seat in frame and axle cap. The bearing should be clamped tight in its seat in order to prevent it from being shaken about. The loose bearing will soon be hammered smaller on the outside, as the motor will pound on the bearing with energy proportioned to the motor weight and the power transmitted from the pinion to the gear when the motor is started. The continuous knocking of the axle against the bearing when the wheels pass over rail joints or switches will also tend to reduce the outside of the bearing. It is, therefore, necessary to make these bearings from high-grade bronze alloy, which, however, should not be so hard as to cause excessive wear on the axle. Cast iron or malleable iron babbitt-lined bearing shells have generally been eliminated.

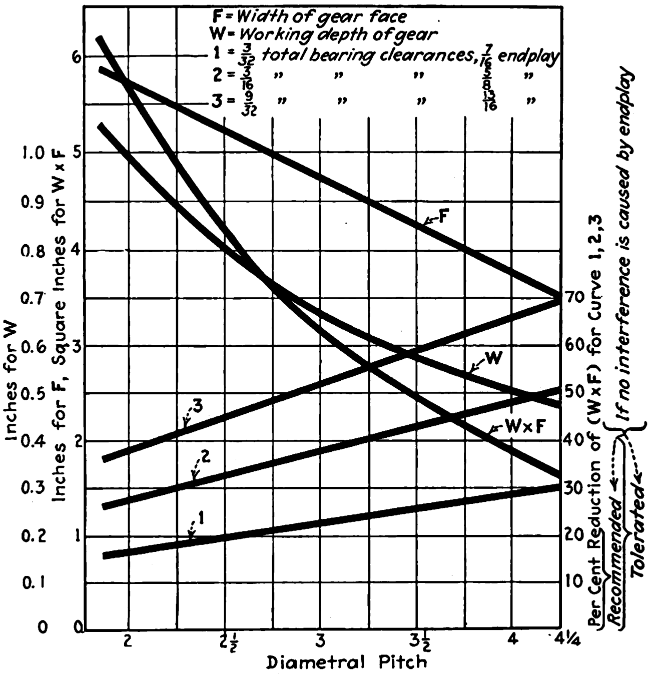
If the axle bearing is loose it should be clamped tight by means of axle cap bolts or by replacing the loose bearing. The motor should be taken out of service as soon as it is found that the new bearing cannot be clamped tight. This is to prevent excessive wear on the frame and axle cap, which would cause loose dowels or worn keyways.

REDUCTION OF GEAR MESH CAUSED BY INCREASE IN GEAR-CENTER DISTANCE AND END PLAY

Clearance Between Points					Armature End Play	Motor End Play	Per Cent Reduction of Gear Width × Working Depth					
1–2	3–4	5–6	7–8	9–10			4 DP 3½ F	3½ DP 4 F	3 DP 4½ F	3 DP 5 F	2½ DP 5 F	
0	0	$\frac{1}{32}$	$\frac{1}{16}$	0	$\frac{3}{16}$	$\frac{1}{4}$	29.0	25.5	22.5	21.5	20.0	Up to 30 per cent recommended if no interference is caused by end play
0	0	$\frac{1}{32}$	$\frac{1}{16}$	0	$\frac{1}{4}$	$\frac{3}{8}$	33.0	29.5	26.0	24.75	23.0	
0	0	$\frac{1}{32}$	$\frac{1}{16}$	0	$\frac{5}{16}$	$\frac{1}{2}$	37.5	33.5	30.0	28.0	26.0	
0	0	$\frac{1}{16}$	$\frac{1}{8}$	0	$\frac{3}{16}$	$\frac{1}{4}$	45.5	40.0	35.5	34.5	30.0	Up to 40 per cent tolerated by some operators
0	0	$\frac{1}{16}$	$\frac{1}{8}$	0	$\frac{1}{4}$	$\frac{3}{8}$	49.0	43.0	38.0	37.0	33.0	
0	0	$\frac{1}{16}$	$\frac{1}{8}$	0	$\frac{5}{16}$	$\frac{1}{2}$	52.2	46.5	41.0	40.0	36.0	
0	0	$\frac{3}{32}$	$\frac{3}{16}$	0	$\frac{3}{16}$	$\frac{1}{4}$	61.7	54.5	47.5	47.2	41.0	Reduction above 40 per cent should be avoided
0	0	$\frac{3}{32}$	$\frac{3}{16}$	0	$\frac{1}{4}$	$\frac{3}{8}$	64.0	57.0	50.0	49.3	43.5	
0	0	$\frac{3}{32}$	$\frac{3}{16}$	0	$\frac{5}{16}$	$\frac{1}{2}$	66.4	59.5	52.5	51.5	45.8	

DP—Diametral pitch, inches.
F—Width of gear face, inches.

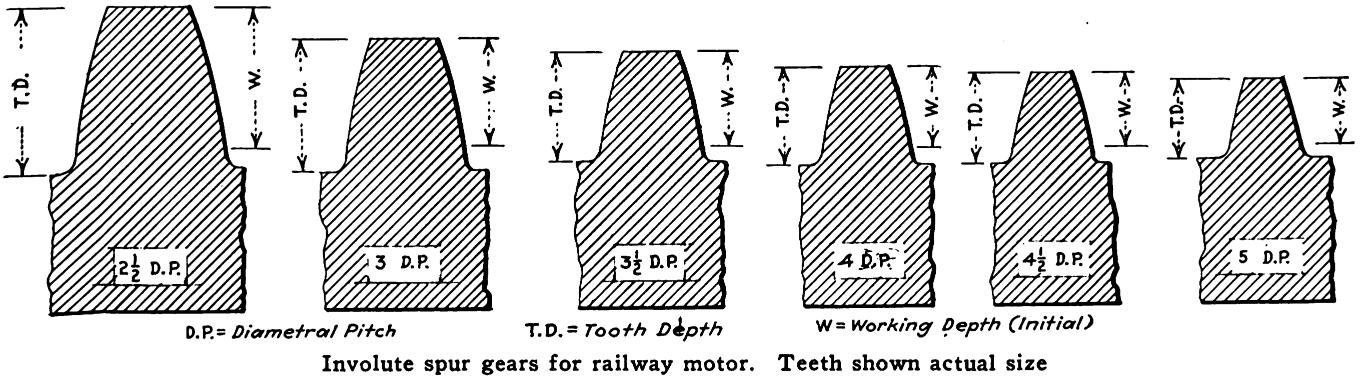
After the several surfaces have been considered the effect of the above clearance on the gear-center distance will be investigated. Experience has shown that the wear on the axle bearing of railway motors occurs very little off the vertical center line of the axle and that the maximum armature bearing wear is approximately 20 or 25 deg. away from the vertical center line of the armature shaft; in other words, the actual gear spread is a fraction of the total bearing wear. However, in order to simplify this investigation it is assumed that the worst conditions may prevail; that is, that the wear on the motor is such that the sum of all clearances between the different surfaces is equal to the maximum increase in gear-center distance. With increased gear-center distance the actual working depth will be smaller than the initial.



Spread of gear centers due to wear between points 5-6 and 7-8

In addition to the working depth, the width of the gear face has to be considered. Under the worst conditions the maximum total end play may be equal to the sum of armature end play plus motor end play. Similar increase in gear-center distance will reduce the depth of gear mesh (working depth) and the end play will reduce the alignment of the pinion width with the gear width. The reduced depth of gear mesh or effective working depth has to be multiplied with the effective gear width and the product of these factors should be compared with the initial dimensions when the gearing is properly aligned. This comparison will show the total reduction in the area of the gear mesh. The reduction in this area will increase the pressure per square inch on the teeth of the gearing and, therefore, the wear increases, which again reduces the mileage obtained on the gear and pinion of such motors. An accompanying table gives the per cent reduction of the product (Working depth) × (width of gear face) when properly aligned for the prevailing pitches and width of gear face of motors in service are calculated. The assumed clearances and end plays for the reductions are also indicated in the tabulation.

A maximum reduction of approximately 30 per cent of working depth times gear width should not be exceeded; 40 per cent is not considered good practice. However, it may be necessary to increase the allowable reduction to this limit on roads where the necessary



Involute spur gears for railway motor. Teeth shown actual size facilities are not available for babbitting bearings and machining motor parts.

In the graphs showing reduction of gear mesh caused by increases in gear-center distance and end play, the diametral pitches of the gearing are plotted on the horizontal axis. The initial working depth of the gear teeth is shown on the vertical axis by graph *W* each depth above its pitch. The width of gear face is indicated by graph *F*. This width of the gear face is assumed to be continually decreasing in proportion to the increase in diametral pitch. The width *F* multiplied by the working depth *W* is the same as the measurement (curve $W \times F$) for the area of the gear mesh. The product of $W \times F$ is also plotted on the vertical axis above the respective pitch. Graphs 1, 2 and 3 indicate the per cent reduction of the $W \times F$ under consideration of their respective armature and axle bearing clearances between points 5-6 and 7-8 plus armature and motor end play as specified. The per cent of reduction which each point of these graphs represents can be found by the scale given on the vertical axis on the right-hand side of the illustration. The different values taken from the graphs are given in the following tabulation for 3 and 4¼ diametral pitch:

Diametral pitch (D.P.)	3	4¼
Assumed width of gear (*F*), initial, inches	4¾	3½
Working depth of tooth (*W*), initial, inches	0.67	0.47
$W \times F$, square inches, gearing aligned perfectly	3.15	1.65
Per cent reduction of $W \times F$ (1) $\frac{3}{32}$ in. increase in gear-center distance, $\frac{7}{16}$ in. end play	23	30
Per cent reduction of $W \times F$ (2) $\frac{3}{16}$ in. increase in gear-center distance, $\frac{5}{8}$ in. end play	38	50.5
Per cent reduction of $W \times F$ (3) $\frac{9}{32}$ in. increase in gear-center distance, $\frac{13}{16}$ in. end play	52	59

The 30 per cent reduction recommended and the 40 per cent tolerated are indicated on the scale for the per cent of reduction. The reduction of $W \times F$ depends largely on the clearance between the wearing surfaces. The end play is of less importance than the gear mesh.

The maximum allowable increases in gear-center distance and end play should depend on the diametral pitch of each motor. The recommended maxima (within 30 per cent) have been calculated and the respective dimensions for armature and axle bearing clearances and end play are given in another table for the most prevailing pitches and gear widths. The corresponding dimensions for 40 per cent reduction of $W \times F$ tolerated by smaller roads are also shown in the same tabulation.

The allowable armature end play and motor end play should be checked carefully in regard to interference of stationary part with rotating parts within the motor or of motor parts with parts of the truck. It should be borne in mind that the life of many motor parts as well as gears and pinions and truck and track will be affected by the foregoing limitations.

Figures Corrected

IN THE article "Base Plate Joint Developed by Eastern Massachusetts Street Railway," published in this paper April 30, two minor errors appeared. At the top of page 775 under "General Summary of Bending Tests," the load for the fishplate joint instead of reading 266,300 lb. should be 244,200 lb., and on the same page under the "Summary of Tests on 9-in. Girder Rail," the same average figure, given as 266,300 lb., should read 244,200 lb., as above. This mistake was made in the original data computation and was due to the fact that the preparation of the material for the article was hurried. On page 776 the two joints on 7-in. tee rail shown in illustrations in the right-hand column were welded with 7-in. x 36-in. x 1-in. plates.

Depot Car Attracts Travelers

FOR many years the taxicab companies in cities large and small have solicited patronage at steam railroad depots, so that the traveling public has cultivated the habit of using the taxicabs almost exclusively from the station to the hotels. It remained for the El Paso Electric Railway to take advantage of its valuable trackage rights in front of the Union Depot at El Paso, Tex., and install special depot service which would draw patronage. On a spur track from one of its main lines in front of the depot is parked a specially painted car which by its attractiveness and the advertising on its sides invites the arriving railroad passenger to use it to get from the station to the hotels. The car is of the one-man, double-end Birney type painted red and blue, trimmed in gold. Covering both sides of the car are the words—"This Car Will Take You to Your Hotel and Also Connects with Juarez, Old Mexico, Street Cars."

The haul is something less than 1 mile to the business section, where the car loops and returns over the same route. Service is given all day, the schedule being varied somewhat so that the car meets arriving trains.

68
THIS CAR WILL TAKE YOU
TO YOUR HOTEL
and also
CONNECTS WITH JUAREZ OLD MEXICO
STREET CARS
68

Depot car of the El Paso Electric Railway waiting for incoming steam railroad trains in front of Union Depot. The attractiveness and the invitation to ride expressed on the car are aimed to wean the traveling public from taxicabs

Finished track on Madison Road with concrete surfacing in track area

Cincinnati Is in Midst of Intensive Reconstruction Program

Terms of new franchise necessitated considerable track reconstruction. Co-operation between the city and railway facilitates progress. Elimination of noise and riding comfort are given careful consideration

ELEVEN miles of 5.21-ft. gage track was rebuilt in Cincinnati, Ohio, during 1926, as the first step in an elaborate program of track reconstruction. This was included in the terms of the franchise granted to the Cincinnati Street Railway, which became effective on Nov. 1, 1925. This reconstruction is only part of an extensive plan for the rehabilitation of the entire property.

Although 11 miles of single track was reconstructed last year, it is planned to make 1927 a year of still greater activity. The program calls for rebuilding at least 27 miles of single track. In the franchise it is anticipated that a considerable part of the total trackage will be reconstructed by 1930.

A thorough analysis of the conditions of the track throughout the entire property showed that after years of service certain sections had become worn out, loose, distorted and in immediate need of replacement. On the major portion of these sections the tracks were completely removed and new foundation, ties and rails installed in accordance with the company's adopted standard design.

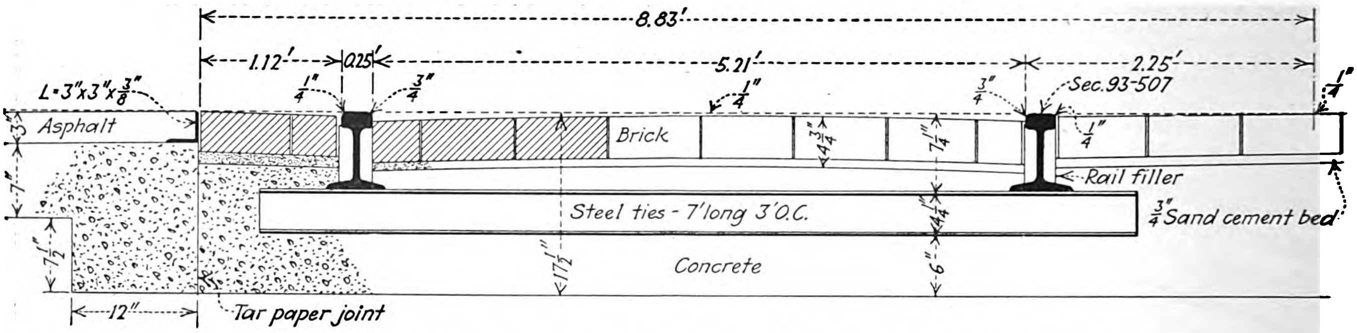
Although the franchise specified reconstruction of certain tracks due to necessary street improvements, the company nevertheless went to considerable expense to rebuild several other sections not covered by the franchise. This additional work, performed primarily to improve the riding qualities of the cars and eliminate unnecessary noise, has caused favorable comments from the communities affected and has had the effect of increasing the public friendliness.

The old foundation of the section of track located in Madison Road between Elmhurst and Observatory Road was retained and, as a result, caused some little difficulty and a slight departure from the company's standard construction. After the pavement was removed from this section it was found that the concrete was in perfect condition and suitable for years of further service. It was accordingly decided to remove and scrap the worn-out rails and ties. The tie pocket centers in this old foundation for wooden ties were 2 ft. apart, whereas the company's standard tie pocket spacing for steel ties is 3 ft.

TEMPORARY TRACK USED TO CONTINUE TRAFFIC

Excavation work was started on April 26. It was decided to work on one track at a time and continue service on a two-track basis, with a temporary track erected on the pavement adjacent to the track under construction. Rails were laid to gage on wooden ties spaced on 24-in. centers. Excavated refuse was placed around and between these ties as ballast. Rails, stone, cement, ties, etc., were speedily delivered to the job by means of motor trucks and rail cars, the method of transportation depending on the urgency and the traffic situation. When possible all excavation was done with power machinery.

Due to the size of the tie pockets and the elevation of the top of the concrete foundation retained it was much cheaper to use a steel tie and a rail of slightly different dimensions from the company's standard than to attempt cutting the concrete to suit the standard material. As a



Cross-section of standard track construction used by Cincinnati Street Railway

result a 6-in. T-rail and a 7-ft. Carnegie M-24 tie with No. 23 clips and bolts were used instead of the company's standard 7-in. T-rail and a 7-ft. M-25 Carnegie steel tie with No. 23 clips and bolts. Girder rail of 140-lb. section was installed on all curves. Steel ties were placed in the old concrete tie pockets with 2-ft. centers and bolted to the rail. A ½-in. space was left in the rail joints to allow sufficient space for thermit welding of the joints. Carey elastite filler was used on either side of the rail.

After the track was gaged, lined up and brought to grade concrete was poured in and around the ties and rails in sections. This acted as a retaining foundation for maintaining the alignment, at the same time leaving room for the thermit welding of the joints. The rail was made solid throughout its entire length and no provision was allowed for any additional expansion or contraction.

The concrete for the pavement in the track area was mixed 1:1½:3, whereas the concrete for the track foundation was mixed 1:3:6. A piece of two-ply tar paper separated the city street pavement foundation at the railway line from the railway track foundation. Similar separation of the track surfacing from the street surfacing was accomplished by means of a 3-in. x 3-in. x ⅜-in. angle laid on the railway line parallel with the rail.

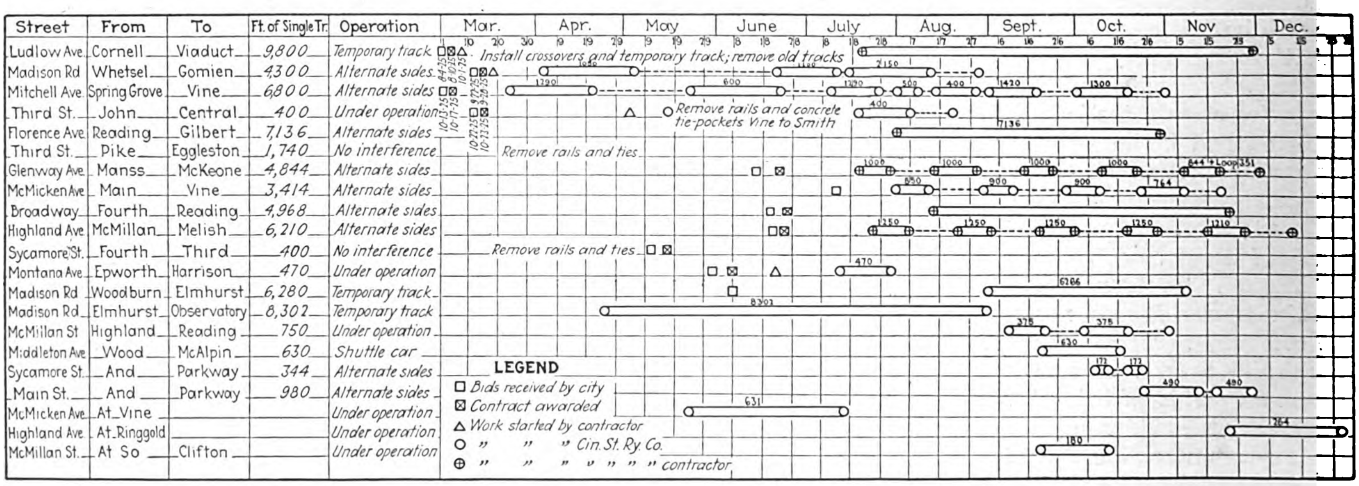
Although the type of construction used on Madison Road is slightly different from the company's standard, it is believed that it will prove equally serviceable. After the completion of the first track the second was torn up and rebuilt in the same manner. Reconstruction was brought to a successful completion without a single service or vehicular interruption of any great duration. This Madison Road job consisted of rebuilding approximately 8,302 ft. of track. An average gang of 70 men was employed on this work for approximately 220 days.

FULL CO-OPERATION EXISTED

The first year's program consisted of the reconstruction of 21 sections of track varying from a minimum length of 344 ft. to a maximum length of 9,800 ft. The tracks removed had been in continuous operation for the past fifteen to twenty years. As it was found that considerable variation existed in the construction, each section had to be analyzed independently and considered as a separate problem. A careful study was made of all details involved and a definite program of procedure was decided upon. Careful preliminary plans of operation were prepared to assure non-interruption of service and a decision reached as to the best method. The decision to use a single track or to install a temporary one for the maintaining of non-interrupted service on a certain section was given to the interested parties before the work was started. Explicit orders were also issued to keep the vehicular traffic in motion.

Full co-operation existed between the railway company and other public utilities. Where it was thought that conduit or other lines of these companies might interfere with the track construction, ample notice was given in order that provisions could be made to take care of the relocation without causing any interruption of the work.

Details regarding grades, roadway, drainage, etc., were discussed with the city engineers prior to starting the reconstruction as well as during its progress. This co-operation between the railway and the city engineer-



Street	From	To	Ft. of Single Tr.	Operation
Ludlow Ave.	Cornell	Viaduct	9,800	Temporary track
Madison Rd	Whetsel	Gomien	4300	Alternate sides
Mitchell Ave.	Spring Grove	Vine	6800	Alternate sides
Third St.	John	Central	400	Under operation
Florence Ave.	Reading	Gilbert	7,136	Alternate sides
Third St.	Pike	Eggleston	1,740	No interference
Glenway Ave.	Manss	McKeone	4,844	Alternate sides
McMicken Ave.	Main	Vine	3,414	Alternate sides
Broadway	Fourth	Reading	4,968	Alternate sides
Highland Ave.	McMillan	Melish	6,210	Alternate sides
Sycamore St.	Fourth	Third	400	No interference
Montana Ave.	Epworth	Harrison	470	Under operation
Madison Rd	Woodburn	Elmhurst	6,280	Temporary track
Madison Rd	Elmhurst	Observatory	8,302	Temporary track
McMillan St	Highland	Reading	750	Under operation
Middleton Ave	Wood	McAlpin	630	Shuttle car
Sycamore St.	And	Parkway	344	Alternate sides
Main St.	And	Parkway	980	Alternate sides
McMicken Ave.	At Vine			Under operation
Highland Ave.	At Ringgold			Under operation
McMillan St.	At So	Clifton		Under operation

LEGEND
□ Bids received by city
☒ Contract awarded
△ Work started by contractor
○ " " " Cin. St. Ry. Co.
⊕ " " " " " " " contractor

Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Install crossovers and temporary track; remove old tracks
Remove rails and concrete tie-pockets Vine to Smith
Remove rails and ties
Remove rails and ties
8302
631

Progress chart used by Cincinnati Street Railway for 1926 track reconstruction work ing staff brought the city and railway in closer relationship and permitted the work to proceed without serious interruptions.

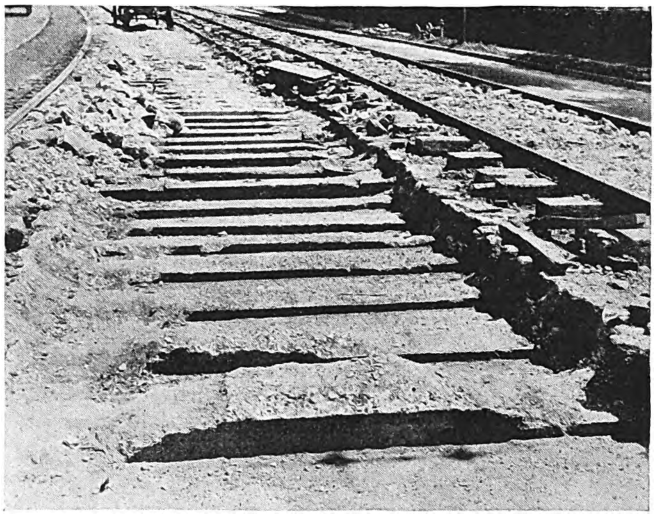
STANDARD CONSTRUCTION WITH STEEL TIES

The company's standard construction used on the other sections consisted of 7-in. T-rail, section 93-507, installed on M-25 Carnegie steel ties 7 ft. long with No. 23 clips and bolts. These ties were spaced on 3-ft. centers and were mounted on a 1:3:6 concrete foundation, 6 in. thick. Concrete was poured around the ties and up the web of the rail to such a height as would permit of the installation of a brick or Durax pavement. A ¾-in. sand cushion was used under all pavement. All rail joints were thermit welded.

A ¼-in. space was left between the pavement and the outside of the head of each rail. The pavement between the rails was laid in an arched formation with the top of the arch ¼ in. below the top surface of the rail and ¾ in. below the top surface of the rail at its connecting point with the rail. Carey elastite filler was installed on either side of the rail.

The arrangement with the city for the company's program of track construction was not completed early enough in the year for the company's own organization to handle the extensive program. It was considered advisable to employ a contractor to take over a portion of the work so that it would be completed before winter weather forced suspension of construction. The work was carried on in an efficient manner by the use of modern excavating, concrete mixing and material handling apparatus.

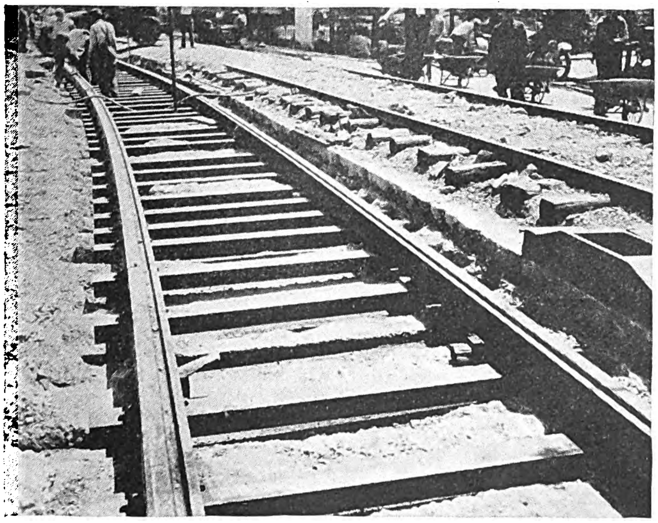
When the track reconstruction program was arranged for 1926 the maintenance of way department of the Cincinnati Street Railway prepared a program chart incorporating the location and length of each section, together with the expected date of starting and the estimated date of completion. With daily notations this print indicated the actual progress of all work and afforded a means for the department to see the entire situation at a glance. All reconstruction work was carried on without any service interruption. Careful consideration was given to the kind of track pavement to be adopted for each section reconstructed, in order that it would harmonize fully with the adjoining street pavement. Some sections required a Durax pavement in order to obtain this harmonious effect, whereas others required brick. Where neither of these were suitable concrete was used.

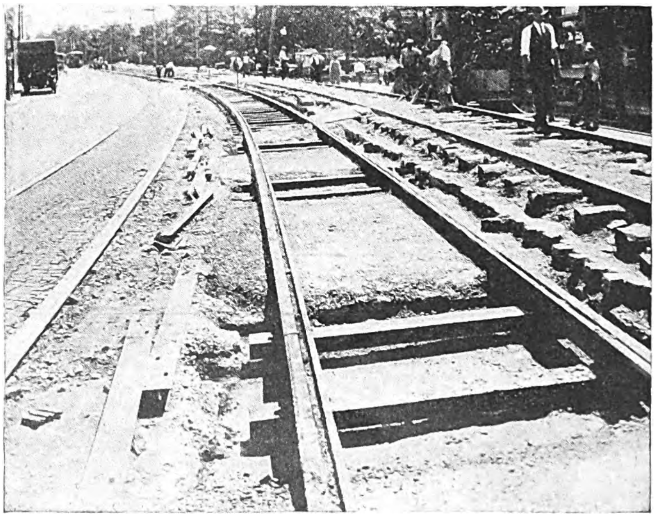

Old concrete foundation on Madison Road after removal of rails and wooden ties

Realizing that unusual noise in any part of the system would cause immediate complaint from the residents of the community affected, the railway gave this subject careful consideration. When the 1926 program was arranged an examination was made of the track sections involved and where there was any doubt whether repair work would eliminate the noise the tracks were completely reconstructed. This matter will be given still greater attention in 1927. Not only were low joints, cupped or corrugated rails considered from a noise standpoint but from a maintainance standpoint as well. It was appreciated that if these defects were allowed to remain the track foundation and pavement would ultimately be destroyed and reflect similar destruction upon the rolling stock. This, of course, would result in higher maintenance costs.

A complete inspection of the track and roadway has been completed for the 1927 program. Plans, specifications and construction schedules are being formulated to carry on the work in an efficient and uninterrupted manner.

Although the franchise does not necessitate the completion of the work before 1930, the company nevertheless is endeavoring to comply with its terms before the specified time.


New steel ties installed in the wooden tie pockets of the old concrete foundation


Temporary track laid on street pavement and method of anchoring track by concrete

Safety Guards in Wilkes-Barre & Hazleton Shops

Study of Working Conditions Resulted in the Design and Installation of an Elaborate System of Shrouds for Moving Parts

NEAT, rugged and well-designed safety guards recently were installed to protect all moving elements of the machinery in the Hazel Park shop of the Wilkes-Barre & Hazleton Railroad, Hazleton, Pa. The installation of these guards was the direct result of a safety campaign inaugurated some time ago, and to which considerable time and study were devoted. It had for its primary object the reduction and as far as possible the complete elimination of various kinds of accidents within the organization. All departments were analyzed thoroughly, including track, roadway, overhead, overhauling and inspection shops and storehouse.

In the Hazel Park machine shop an intensive study was made of the operations performed by each employee for the purpose of determining possibilities of danger of bodily injury to the men. As a result of this study, a few changes were made in the shop arrangements and methods. Material constantly used for maintenance, as well as all waste materials, was centralized so as to give greater working freedom. Safety guards were installed on all moving elements of the machinery which in any way appeared to endanger life or limb.

The Hazel Park shop is rather narrow. Along one wall are installed various bins, benches and tool closets for the storage of material and tools required for daily use. On the opposite side of the shop, along the windows, are the various pieces of shop machinery, such as drill presses, lathes, wheel press, boring mills, armature repair stands, numerous small machines and work benches. In addition, the master mechanic's office and storage space are also located on this side of the shop. A standard 4-ft. 8½-in. gage track is installed throughout the entire length of the shop, on the storage bin side. A portion at the end of this track is taken up by the babbitting department. When cars are jacked up above the track the aisle space between the car bodies and the shop machinery is very small.

This shop is used to maintain not only twenty motor cars, one freight motor car and one electric locomotive of the Wilkes-Barre & Hazleton Railroad, but in addition 41 motor passenger cars of the Lehigh Traction Company. When the track is filled with cars the men are constantly moving in close proximity to the moving machinery and the possibility of bodily injury is necessarily increased.

All of these factors were carefully considered in connection with the study of the characteristics of each machine. Proper safety guards were designed. It was decided to use No. 8 Steelite wire with mesh varying from ¾ in. to 1 in., depending on the location of the apparatus to be protected and the possibility of danger. A steel angle of ⅛x¾ in. section was selected to support the wire mesh, on account of its ability to retain its shape after being bent in various curves. Each machine was studied individually and a design adopted which took into consideration the thorough protection of its parts, the solid fastening of the guard to the machine, as well as providing for accessibility to the moving parts for repair work with a minimum of disturbance to the guard itself.

To protect large parts where there was little danger of fingers or small particles coming in contact with them, a wire mesh screening 1 in. in diameter was used, but where there was danger of personal injury or of small particles coming in contact with the machine, ¾-in. mesh was adopted.

Accompanying illustrations show the relative location of well storage bins, track and machinery before and after the safety guards were installed. Additional illustrations show the safety guards used for individual machines.

All the guards were manufactured along the same general line, the thought being the incorporation of ruggedness, neatness and maximum of protection. Each piece of screening and angle was cut to size and shaped by means of forms. Each piece of screening was then laid in its proper angle frame. On top of it a reinforcing strip of flat steel ⅛x½ in. was placed and all were held together rigidly with ¼-in. rivets. Where any doubt existed as to there being sufficient strength to the finished product, an additional ¼-in. x 1-in. horizontal metal strip was installed and riveted to the angle framing. Where necessary to arrange for periodic inspection or maintenance, the guards were provided with hinged doors or hand holes. Each guard was fitted with brackets for fastening to the machine being protected. The guards were all manufactured in the Hazel Park shop under the supervision of James Brown, master mechanic.

Eliminating Hazards in Car Operation

A COURSE in safety for platform employees of the transportation department of the Tennessee Electric Power Company was inaugurated by J. J. Connors, safety director. The entire department is divided into groups of fifteen men and regular weekly meetings are held for each class. The method used in conducting these classes is known as the "job analysis method," originated by the Federal Board for Vocational Education.

In analyzing the safe operation of a street car every detail is brought out. It has shown in these classes that an operator performs eight distinct movements in taking on a single passenger. The operations are further subdivided, developing the fact that there are thirteen hazards which may result in accident while bringing the car to a stop. Opening a car door develops four more hazards and five hazards are present in closing it. In starting a car eight additional causes of possible accidents arise, and numerous other hazards are encountered in piloting the car through the city streets.

In the final analysis of the problem there are 119 accident possibilities from the time the operator begins to bring his car to a stop to take on a passenger until he has completed the operation of his car to the next block.

The class, under the direction of Mr. Connors, passes on the different methods for safe operation and the best ones offered are adopted as standard. The result is that nothing can possibly happen in the average operation of a street car but that the operator has some known means of avoiding it.

The Readers' Forum

Cold Steam Process Used for Cleaning

CHARLESTON INTERURBAN RAILROAD
CHARLESTON, W. VA., May 16, 1927

To the Editor:

There should certainly be no doubt in any one's mind as to the value of making cars striking in appearance and clean and comfortable to ride in. In the first place, a color scheme of high visibility is at all times a reminder to the public of the presence of the service and has the same purpose as the "repeat" advertising of national products. The cleanliness and brightness of cars is, of course, an invitation to ride, while dirty, dingy, noisy cars attract no one except those who must take that means to get to their destination.

In my opinion, 90 per cent of the value of modernizing equipment is attained by repainting and putting the car in good mechanical and electrical condition. This is particularly true where the roadbed is in good condition. I believe further that cars of really antiquated design cannot be modernized profitably. To sum up the matter, it is merely a question of adopting a higher standard and a more rigid schedule of maintenance than any railways have adopted in the past. The added features of modernization, such as soft, spring-cushion seats and linoleum-covered floors are all good business getters, but the problem of the smaller railways is to make the 90 per cent improvement and operating results will eventually justify the purchase of the latest types of rolling stock, incorporating these nicer refinements in their original design.

In February, 1926, owing to the death of the president of this company, Arthur M. Hill was elevated to the post of vice-president and general manager. It has only been during the last few months that he has been able to devote very much thought and effort to the question of modernization. He has, however, started a program of repainting and rebuilding and this work is proceeding at the rate of about two cars a month. It is hoped to increase this to at least three cars a month.

We have adopted orange as an outside body color, with natural wood finish on doors and window frames. The inside colors being used are white headlining, light green walls to the window ledges, with a somewhat darker green from the window ledges to the floor. This two-tone green combination has been carried around the interior of the cabs as well. All exposed piping and equipment are being painted the same color as the back wall of the cab to camouflage them, in place of inclosing such parts. Floors are being renewed and painted. In some of the cars we have adhered to the rattan upholstery, while in others we are using an imitation leather. We intend to vary the interior color scheme on subsequent cars merely for the sake of variety, but expect to adhere to a two-tone combination. We believe that this variation should not extend to the outside colors.

We are also paying a great deal more attention to the cleaning of the cars, particularly the inside. An installation for cleaning cars by the cold steam process is being made at the present time.

Although our rolling stock had not been allowed to get in really bad condition, we found that a great deal of effort could be spent profitably on rebuilding of trucks, welding of broken motor frames, building up of housings, renewing worn bearings, repairing compressors, controller parts, etc. At the same time we have renewed such minor parts as worn straps, frayed and knotted bell cords, greasy and torn motormen's curtains, and the like.

A number of our cars need painting and the inclination is to neglect the rebuilding work in order to get out repainted cars on a faster schedule. However, we believe that a great deal of the effect on the public is lost when old, worn equipment is permitted to go out in the same condition except for a new coat of paint.

The city equipment operated by this company is for the most part fairly light weight and of steel construction, so that it is comparatively easy to modernize. We have some older wooden equipment with monitor roofs, weighing more than 900 lb. per passenger seat, and this equipment we do not intend to remodel.

Our own repainting plans have not progressed far enough for us to make a dollars and cents comparison between old and rebuilt equipment. We do not expect any marked improvement in this direction for at least a year because of the fact that we are scattering the rebuilt equipment as widely as possible over the various lines of the system in order not to appear to favor any one line. As there is a more than even chance that a waiting passenger may be forced to board an old car, it is not expected that any considerable number of people will abandon other means of transportation in favor of car service. The real effect will come, we feel, when 60 to 80 per cent of our equipment has been rebuilt.

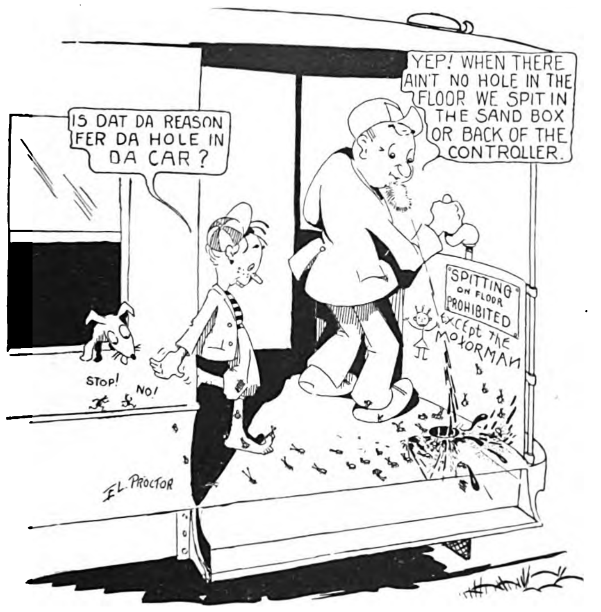
J. E. ALBERT,
Assistant to General Manager.

International Railway Cleans Up and Paints Up

IN LINE with the city-wide spring clean-up campaign the International Railway, Buffalo, N. Y., has painted 134 cars and buses so far this year. The schedule now calls for every car to go through the paint shop at Cold Springs every eighteen months. Particular attention is being directed to the appearance of the Niagara Falls high-speed cars. Simultaneously with advance in fares on the interurban lines a campaign to improve the equipment on the line was begun by the company.

Since the increase has been granted nearly all high-speed cars have been repainted and refinished, and work is now being extended on the Lockport division. The painting schedule calls for refinishing and the placing in the cars of the new announcement of the connection with the Gorge Trip. The cars are finished in a bright yellow, with the lettering along the lower side panels and the front dash in a dark mahogany. The front panels below the motorman's cab carry the wording: "Buffalo-Niagara Falls High-Speed Line." The side panels display the I.R.C. monogram and the new wording: "Buffalo-Niagara Falls High-Speed Line Connecting with Niagara's Great Gorge Trip."

A contract has also been let for equipping the high-speed line throughout with automatic block signals. The I.R.C. electrical force will install the new equipment when it is received.


IS DAT DA REASON FER DA HOLE IN DA CAR?
YEP! WHEN THERE AIN'T NO HOLE IN THE FLOOR WE SPIT IN THE SAND BOX OR BACK OF THE CONTROLLER.
SPITTING ON FLOOR PROHIBITED except the MOTORMAN
STOP!
NO!
E.L. PROCTOR

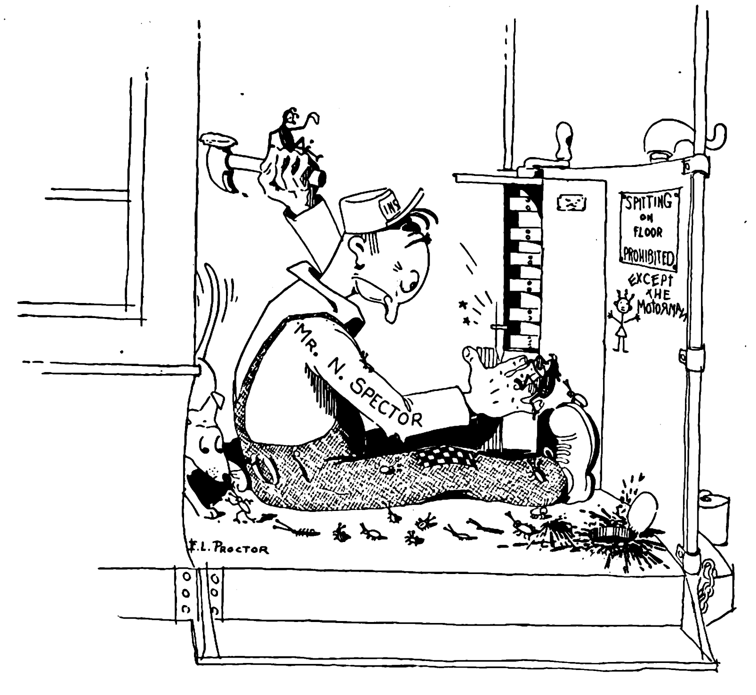
Adventures of

Old Man Trouble

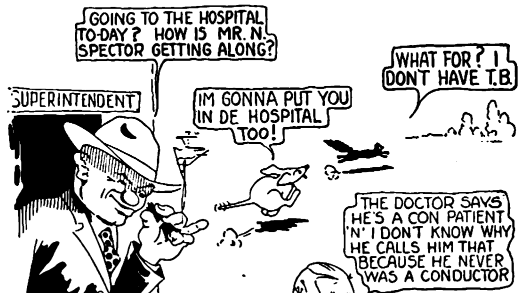
on the

Hicksville Railway

May Flowers Look Nicer in the Woods than They Do in the Hospital


INS
MR. N. SPECTOR
SPITTING ON FLOOR PROHIBITED
EXCEPT THE MOTORMAN
E.L. PROCTOR

The practice of spitting on the floor by car operators not only makes the front end filthy but is responsible for the spread of disease which casts a dark shadow over many happy homes


GOING TO THE HOSPITAL TO-DAY? HOW IS MR. N. SPECTOR GETTING ALONG?
SUPERINTENDENT
IM GONNA PUT YOU IN DE HOSPITAL TOO!
WHAT FOR? I DONT HAVE T.B.
THE DOCTOR SAYS HE'S A CON PATIENT 'N' I DONT KNOW WHY HE CALLS HIM THAT BECAUSE HE NEVER WAS A CONDUCTOR
N. SPECTORS' DAUGHTER
E.L. PROCTOR

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

The Judges Who Will Pass Upon the Articles Submitted in "Journal's" Maintenance Competition

WITH the co-operation of Daniel Durie, president of the American Electric Railway Engineering Association, judges who will serve in connection with the ELECTRIC RAILWAY JOURNAL'S maintenance competition have been selected. They include the three chairmen of the standing committees having maintenance work to do. They are A. T. Clark, Baltimore, chairman of the committee on rolling stock; F. McVittie, Rochester, chairman of the committee on power distribution; Howard George, Newark, chairman of the committee on way and structures; Guy C. Hecker, special engineer of the American Electric Railway Association, and Charles Gordon, editor of the ELECTRIC RAILWAY JOURNAL. These men are recognized leaders in the work of their particular departments and as chairmen of the various engineering association committees their standing will lend weight to the decisions they render.

Judges of the "Journal's" Maintenance Competition

Top, left, Howard George; top, right, Guy C. Hecker; center, A. T. Clark, chairman; lower, left, Charles Gordon; lower, right, F. McVittie.

As recognized leaders in the work of their particular departments and as chairmen of the various engineering association committees, the standing of these men will lend weight to the decisions they render

A. T. Clark

Mr. Clark is superintendent of rolling stock and shops of the United Railways & Electric Company, Baltimore, Md. He has been connected with the company there since 1907. He was graduated from the Sheffield Scientific School with the degree of M.E. In the past he has served with the J. G. Brill Company, the Southwark Foundry & Machine Company, the Link Belt Engineering Company and the Bethlehem Steel Company.

F. McVittie

Mr. McVittie is electrical engineer of the New York State Railways, Rochester Lines. He is a Canadian by birth, received his early education in the public and high schools at Rochester, N. Y., and his technical training at Rose Polytechnic Institute, Terre Haute, Ind. For the past twenty years he has been connected with the New York State Railways in various capacities, and in 1917 was appointed electrical engineer of the Rochester Lines.

Howard George

Mr. George is with the Public Service Production Company, Newark, N. J. He took his present post in the fall of 1925. Before that for five years he was engineer of maintenance of way for the Public Service Railway, another subsidiary of the Public Service Corporation. He has been connected with the companies in New Jersey since 1906. He served the company first as field engineer, then as division engineer, assistant to the chief engineer and as engineer of maintenance of way. During the term of his service in this last-mentioned capacity the responsibility was made his for the design and construction work on building operations, his transfer to the production company was a natural result of the widened activities of the man.

G. C. Hecker

Mr. Hecker has been special engineer of the A.E.R.A. since March, 1922. In that post he succeeded J. W. Welsh, now executive secretary of the association. His connection with the industry dates from 1903, when he became connected with the Citizens Traction Company, Pittsburgh. He was advanced eventually to the position of chief electrician, a post that really carried responsibilities much greater than the title he held would indicate. In 1920 he became a general engineer in the railway department of the Westinghouse company and from that position he went to the association. He has to his credit to a scholastic attainment the completion of the course in electrical engineering at the Carnegie Institute of Technology at Pittsburgh.

Charles Gordon

Mr. Gordon is by training a car equipment engineer. He served formerly in this capacity with the Chicago Surface Lines, responsible under H. H. Adams for engineering development in connection with the operation of about 4,000 surface cars engaged in the hardest kind of city service. He entered the railway field in Chicago in 1912, upon his graduation from the electrical engineering department of the University of Illinois, and continued in railway work until the fall of 1917, when he entered the army air service. On his return to civilian life he served with the Vacuum Oil Company for a year, but then became equipment engineer with the Chicago Surface Lines, with office in Chicago. He entered journalism with the ELECTRIC RAILWAY JOURNAL in 1923.

All Articles in This Section Submitted in Maintenance Competition

THIS section contains the first group of items submitted in ELECTRIC RAILWAY JOURNAL'S maintenance competition. The judges whose names are published on the adjoining page will select one of these for the first $25 prize awarded for the month of May. The winner will be announced in next month's maintenance issue, dated June 18. In addition, the author of each item in this section will receive $5 immediately. The winning article, together with all others submitted before Aug. 1, 1927, is eligible for the capital prizes of $200, $100 and $50 respectively, as previously announced.

Maintenance Men, Don't Overlook This Opportunity of Winning Recognition! There are eleven of these monthly prizes left, besides the three capital prizes. Get your articles in early. That gives you a better opportunity of winning one of the early monthly prizes. Track and distribution men are particularly urged to enter the contest. At present, the equipment department has by far the best showing. Don't complain later that the track and line was not properly represented. This is your contest. Get those maintenance kinks in now! See the April 16, 1927, issue, pages 700 and 701 for full details.

REMEMBER!

ANY employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items suitable for publication in this section.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

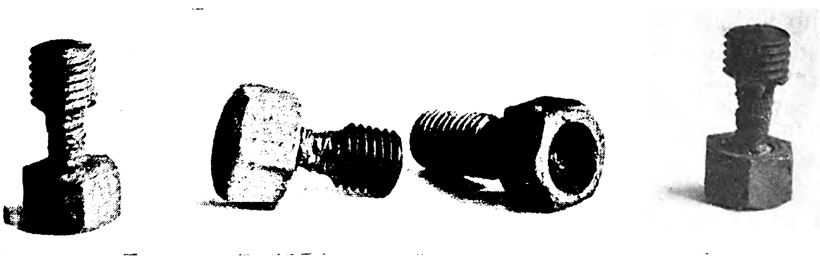
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—13

Method of Removing Broken Cap Screws*

BY P. A. GILBERT

Foreman Welder Rolling Stock and Buildings Department,
Philadelphia Rapid Transit Company, Philadelphia, Pa.



Broken cap screws which have been removed by welding an extension with nut for turning

IN THE maintenance of certain types of motors operated by the Philadelphia Rapid Transit Company considerable difficulty was experienced due to breakage of cap screws holding the axle bearing caps in place. Frequently this breakage occurred in such a way that a short end of the cap screw still remained in the aperture. This prevented the insertion of a new cap screw until the broken portion was removed. To facilitate the removal of these broken ends a special procedure is used in the shops.

First an acetylene torch is used to heat the aperture long enough to burn out any accumulation of oil or grease that may be present. Following this a column of metal is built up on top of the broken end of the cap screw by electric welding. This is brought up to a height so that it will extend somewhat above the top of the aperture. An old nut of proper size is then dropped down over the column of metal and the welding operation is continued until the hole in the nut has been filled up and is thus welded in place. With this method the nut is firmly welded to the broken part of the cap screw through the column of metal, and a wrench can be applied for removal.

An inexperienced welder may have some difficulty in performing this operation, particularly if the aperture is under ¾ in. diameter. To overcome this the end of the electrode is wrapped with friction tape, which serves to prevent it from coming in contact with the side of the hole. The tape, of course, burns off as the arc progresses. It is very seldom that this treatment has failed to remove the broken end of the screw.

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*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest

Electric Railway Journal Maintenance Data Sheet

SIGNALS—1

Clearing Indicator Assists One-Man Operators*

By Jay McDonald
Signal Maintainer Chattanooga Traction Company, Chattanooga, Tenn.

A CLEARING indicator which shows the motorman when the signal has cleared behind him is used with all Nachod signals on the lines of the Tennessee Electric Power Company, Chattanooga, Tenn. It has been found of particular assistance in one-man operation. The clearing indicator lamp is the same as is used in the signals. It is inclosed in a small box with a hinged top. The light shines through a 5-in. bull's-eye lens. The color of the lens is optional with the railway. The box which we are using is 7 in. x 7 in. x 4 in. It is placed on a pole about 10 ft. above the ground and far enough from the clearing contactor to be visible plainly to the motorman when the trolley wheel passes under the clearing contactor. The lamp used is a 50-watt, 220-volt size and is wired in multiple with the red light in the signal with two wires each No. 10 solid weatherproof. The clearing indicator shows the motorman when he has cleared the block and also indicates when another car is following him through the block.

In the accompanying diagram an outbound car hitting the setting contactor will set a white light in signal *A* and a red light in signal *B* together with a light in the repeater or indicator. When a car hits the clearing contactor the lights are cleared in the *A* signal, the red light in the *B* signal and the light in the indicator in front of the clearing contactor. The diagram does not show the operation of the white light in the indicator.

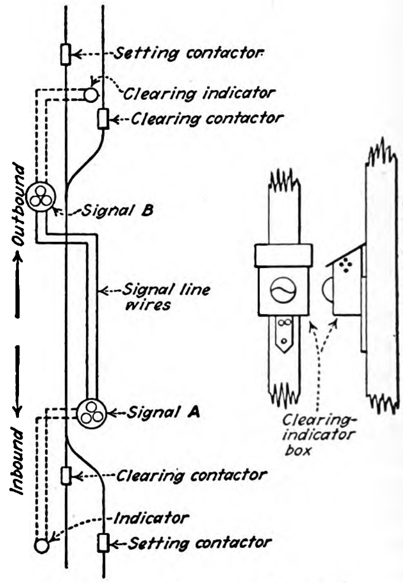

Diagram of connections for clearing indicator

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*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—14

Convenient Hydraulic Bearing Press*

By Equipment Department
Georgia Power Company

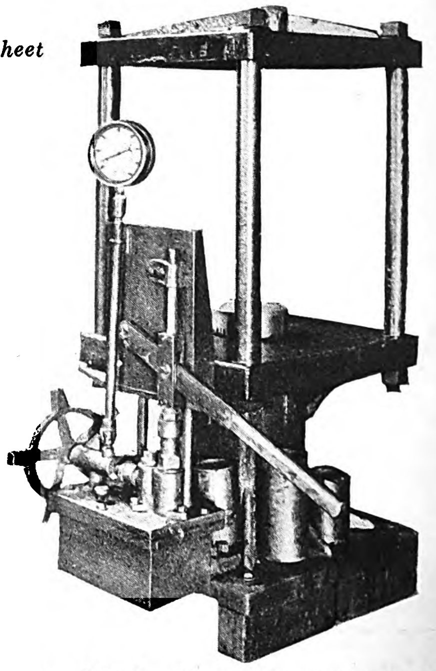
FOR pressing armature bearings into housings, the Georgia Power Company, Atlanta, Ga., uses two hydraulic presses, one at the main shop of the railway and the other at an operating carhouse where armatures are changed.

The base and top plate are made of cast iron. The base contains the pressure cylinder and provides bolting lugs for the reservoir and pump. The top and bottom plates are fastened together with four 1½-in. bolts. Extra heavy pipes of 2 in. diameter are used as spacing sleeves over the bolts. The distance between the face of the ram and the top plate is 21 in. and the travel of the ram is 15 in. The cylinder is lined with a ½-in. sleeve bored out to a diameter of 5 in.

The pump used in connection with the press is a single-acting check-valve type. It is operated by a lever having a four to one ratio. The pump piston rod has a top guide to keep it in line. The pressure release is controlled by a handwheel which is shown at the back of the press in the illustration.

The pressure gage is arranged to indicate from 0 to 30 tons. It is protected by a choke in the pipe, which prevents sudden shock pressures reaching the gage. An assortment of sleeves and mandrels are used to take care of the various diameters of bearings used.

Since the installation of the press at the main shops a saving of 75 per cent in time alone has been realized in the removing and pressing-in operations. The use of the press has eliminated broken babbitt and bruised ends of bearings which, with the previous method, resulted from driving bearings in and out with a hammer and copper block. Another advantage is that positive knowledge is obtained of the fit of the bearing and the pressure used for forcing it into position.



Type of hydraulic bearing press used in the shops of the Georgia Power Company

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*Submitted in Electric Railway Journal Prize Contest

Electric Railway Journal Maintenance Data Sheet

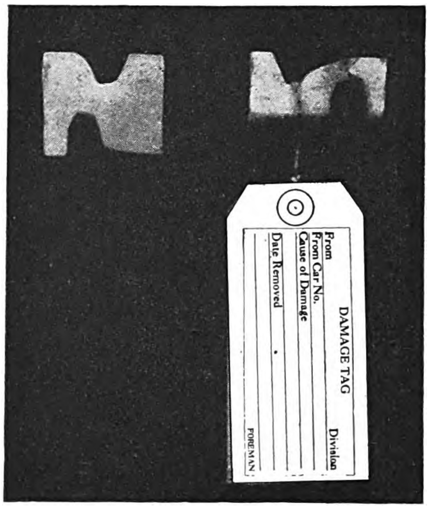
ROLLING STOCK—TRUCKS—5

Parowax Method for Determining Flange Wear*

By J. B. Blaiklock
Master Mechanic Washington Railway & Electric Company, Washington, D. C.

IN ORDERING cars to the shop for a change of wheels it is sometimes difficult for a carhouse foreman to judge correctly the condition of the flanges and report only those wheels for change that have reached the limit of allowable wear. In order to provide for the removal of wheels at uniform limits of flange wear and so that the various carhouse foremen on the Washington Railway & Electric Company's system can keep the mechanical department office informed properly as to flange wear of wheels parowax impressions are made. The practice of taking these impressions was established seven years ago and has proved quite satisfactory.

The accompanying illustration shows two impressions that were taken and sent in to the mechanical department office. Impressions are made in a piece of ordinary parowax about ⅝ in. thick by 1 in. x 2 in. This size will take care of flange impressions for two wheels. The impression is made by pressing the wax against the flange of a wheel which has first been warmed by means of a blow torch to a temperature just sufficient to soften the wax. The impression is then numbered and dated and is sent to the mechanical department office, where it is examined by the master mechanic, who determines whether the car should be shopped and wheels removed or whether it should be continued in service for a longer period. If the latter course is decided upon the wax impression is filed away for future reference and attention.



Parowax impressions of steel wheel flanges

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest*

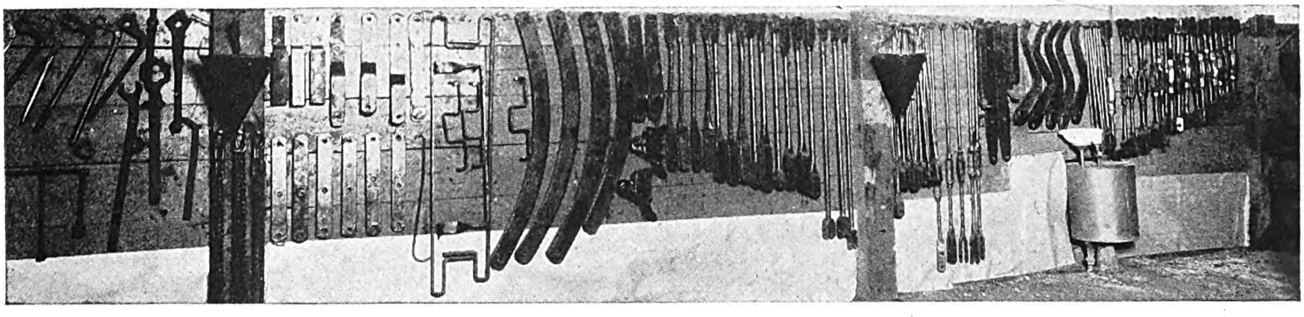
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—7

Tool and Truck Maintenance Parts Board*

By R. M. O'Brien
Superintendent of Rolling Stock and Shops
New Orleans Public Service, Inc.,
New Orleans, La.

A COMBINED tool and truck maintenance parts board which is in use in the Canal shop of New Orleans Public Service, Inc., is proving of great convenience. A check system is not used with this board, as it is under the supervision and care of the foremen. Unless the tool board is completely filled the day foreman will not accept it from the night foreman, and vice versa. This board is located near the center of the shop so that walking distance to it is reduced to a minimum. The visible storage of the maintenance parts tends to make any depletion of stock below certain limits very noticeable to the foreman. This type of board helps materially to improve the appearance of the shops and keeps them neat and clean.



Tools and maintenance parts are kept orderly and neat by means of this type of board

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

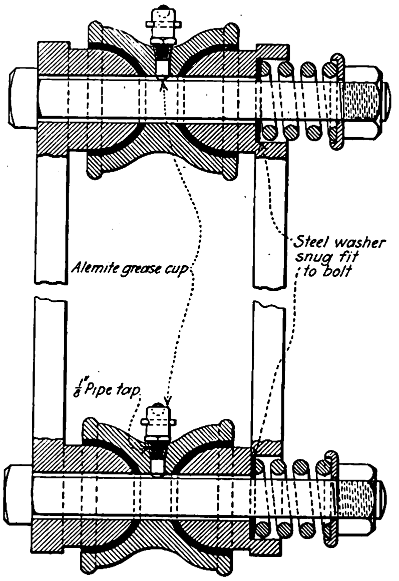
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—6

Alemite Lubrication for Half-Ball Brake Hangers*

By A. Taurman
Superintendent of Equipment, Way and
Structures Birmingham Electric
Company, Birmingham, Ala.

USE of grease cups so as to provide Alemite lubrication for Brill half-ball brake hangers has lengthened the life of these hangers 100 per cent on trucks operated by the Birmingham Electric Company. This has also reduced the wear so that much of the chattering and noise which existed prior to this installation has been done away with. An accompanying diagram shows how these grease cups are attached. The hangers are drilled and tapped for a ⅛-in. pipe fitting at the points where the Alemite cups are placed. The only other change made was to provide a closely fitting metal washer around the bolt at the point where the spring rests against the hanger. With this arrangement the opening at each end was closed effectively. All brake hangers of this type on trucks of the Birmingham Electric Company are being equipped with the Alemite grease cups in this manner.



Application of Alemite grease cups to half-ball brake hangers

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*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—8

Dolly Truck for Crippled Cars*

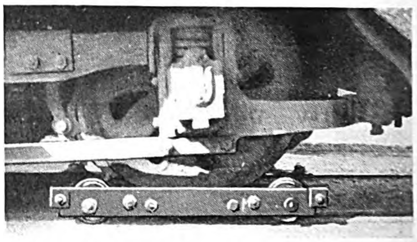
By R. T. Chiles
Master Mechanic Cumberland County Power
& Light Company, Portland, Me.

FOR the past two years we have used a specially designed small truck or dolly for bringing in cars with broken axles, broken gears or other troubles that develop in service which prevent a pair of wheels or an armature from revolving. The truck can be placed in position under the car in about twenty minutes and it requires no chains or fastening to hold it. The pair of wheels to be removed from the running rail is jacked up, together with the car body, and the small truck is pushed into position. The wheels are then lowered until they rest firmly on the inside of the side frames.

Small truck used for bringing in crippled car

The motor geared to this axle, or with four-motor equipments the pair of motors, one of which is geared to the axle, is cut out either at the controller or by removing the carbon brushes. The car can then be operated on its own power without difficulty. The small trucks will pass through special trackwork as readily as a standard car wheel. They can be used with any type of double or single truck car and with wheels from 26 in. to 34 in. diameter, and with a rim width of 4 in. Cars have been brought in a distance of 16 miles on this truck at a speed from 12 to 15 m.p.h. without undue heating of the wheels of the truck.

The general construction of the truck is shown in the accompanying illustration. The side frames are of 1-in. by 4-in. steel, the end crossing bars of 3-in. x 3-in. x ⅜-in. angles and the diagonal braces and motor rests of 3½-in. by ¾-in. steel. The wheels of the truck are 5⅝ in. diameter, with 3-in. tread, 1-in. flange thickness and ¾-in. flange height. They were turned up from 7-in. diameter steel billets and have bronze bushings. Axles are 2½ in. diameter and are drilled so that they can be filled with grease for lubrication. The wheel base is 29½ in. and the truck has a length over all of 41 in., a width of 65 in., and weighs 528 lb. The weight of the car is carried on four bolts, each 1½ in. diameter, shouldered between the side frames of the truck.



Truck installed under 24-ton car

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*Submitted in Electric Railway Journal Prize Contest.

Improved Equipment

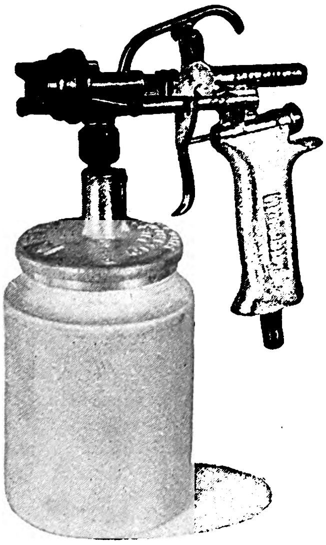
Additional Tools for Electric Railway Maintenance

MANY letters of commendation have been received from our readers regarding the value of short descriptions of improved equipment for railway maintenance. We started the publication of such items in the March 19, 1927, issue, in which sixteen pages were included. Some additional items were published in the April 16 issue and now we are adding the third installment. Such descriptions of the latest tools which can be adapted to electric railway maintenance work enable those responsible for maintenance practices to visualize the shortcomings of their particular equipment and provide for changes which will put their maintenance work on a higher plane. Modern tools speed up repairs and assist in making a railway prosperous.

Paint Spraying Gun

ALEXANDER MILBURN COMPANY
1416-1428 West Baltimore Street,
Baltimore, Md.

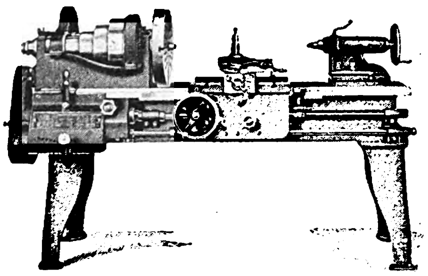
EITHER a siphon feed, pressure feed or gravity feed spray can be used in this spray gun. An adjustment in the multiple head produces a horizontal or vertical flat fan spray or a round spray. When dusting is desired a trip lever is raised, allowing the air to blow alone and shut off the paint supply completely. Both the air and paint valves are operated simultaneously. By pulling the trigger paint flows to the atomizing chamber, is expanded and is forced into the pores of the surface to be covered. A self-centering fluid pin is furnished with the gun which increases or decreases the volume of paint. The gun is all metal, evenly balanced and provided with a natural hand grip.



Standard Cone Head Lathe

REED-PRENTICE CORPORATION
Worcester, Mass.

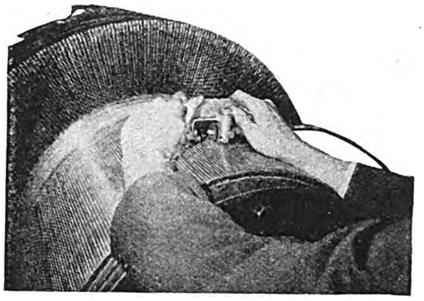
SIXTEEN-INCH standard lathes of this manufacture have four step cones, which in conjunction with gearing of suitable pitches adapts these lathes for a wide range of light and heavy work. The head spindle is made from a steel forging with journals hardened and ground. The spindle bearings are square cast-iron housings which fit snugly into square seats in the headstock. They are lined with babbitt, bored with a diamond and hand-scraped to the spindle. A compound rest is usually furnished with the machine but a plain rest can be furnished if desired. Power cross feed is furnished with both types of rests. An independent feed rod is furnished so that the lead screw is used only for thread cutting. Each machine has a quick change gear box providing 60 changes to both lead screw and feed rod. There are two 13-in. friction pulleys on the countershaft and of a width suitable for a 3½-in. belt. The standard equipment consists of a countershaft, steady rest, tool post, large and small face plates, thread-chasing dial and all necessary wrenches. Motor drive is furnished if desired.



Imperial Under-Cutter

MARTINGALE ELECTRIC COMPANY
Box 2660, Lakewood Branch, Cleveland, Ohio

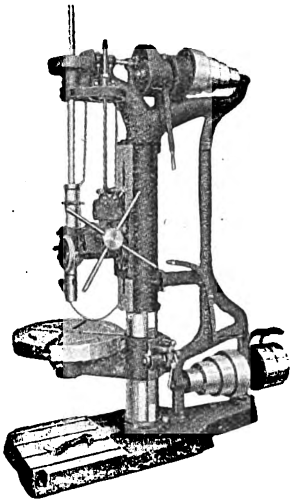
SIMPLICITY of adjustment is a feature of this improved model of the Imperial Under-Cutter. It is claimed to do rapid, clean cutting and to run without vibration. It will cut either the "V" shaped or "U" shaped slot. It has a micrometer screw to adjust the "V" shaped slot guide and a "V" shaped roller guide to ride in an adjacent slot to guide the cutter. A depth gage regulates the depth of slot and a micrometer screw adjusts depth of gage. This cutter is self-cleaning at all times and automatically prevents under-cutting too deep. It practically avoids the possibility of leaving strips of mica along the edges of the bars flush with the commutator surface. Furthermore, it obviates the necessity of going over the commutator the second time to clean out the slots and remove the strips of mica left by square tooth saws. The danger of short circuits between bars is eliminated. The under-cutter is operated by a ¼-hp., 750-r.p.m. motor and is capable of working at the rate of approximately 1 in. per second.



Sliding Head Drills

NILES TOOL WORKS COMPANY,
Division of Niles-Bement-Pond
Company, Hartford, Conn.

SLIDING head drills of the type illustrated have their spindles made of high carbon steel, finished by grinding. There is a ball bearing thrust, quick advance and return. The tool is driven by semi-steel bevel gears of three to one ratio. The spindle speed is graduated and eight speeds are provided. The feed box is located directly on the head and the gears are of hardened steel and run in oil. Handles for changing speeds are stamped with figures to show advance of spindle in thousandths of an inch per revolution and are located within full view and convenient reach. An automatic stop and depth gage is also provided. The sliding head has a long bearing on the column and slides on wide ways



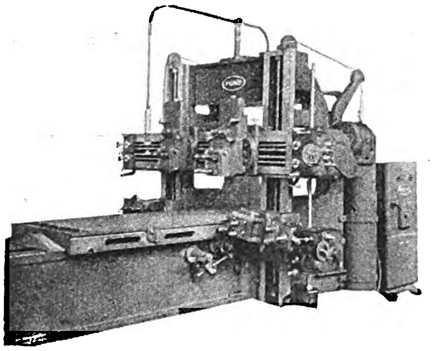
by means of a rack and pinion. The frame has a ribbed and planed base, a large column finished by grinding, a yoke with all gears guarded, a back brace and belt shifter. The table revolves on its center and can be swung out of the way so that the work may be placed on a base plate. The drive is by a four-step cone and sliding back gears operated by a lever. This machine is made in sizes 24, 26, 28 and 32 in.

Planer

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

ONE of the distinct features on this type of planer is the electric feed and traverse controlled by the pendent type switch and levers shown on the gear box at the end of the rail. Single four-position levers, one for each head, control the direction of feed or traverse. These levers, as well as the lever at the top of the gear box for elevating and lowering the cross rail, are all thrown in the direction of motion desired.

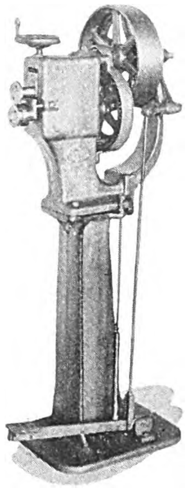
The feed and traverse motor is controlled by the pendent switch and the actual distance the heads or rail travel can be controlled either from the pendent switch or by the levers, whichover is more convenient. The amount of feed is set by a direct reading dial shown on the gear box and ranges from 1/64 in. to 1 in. Electric feed and traverse through the motor on the end of the rail make for simplicity, as the usual feed box in the bed has been eliminated. A self-contained gear box flooded with oil contains all the feeding and traversing mechanism. The control levers are duplicated at the ends of the cross rail, so that with the pendent switch swinging to any position the operator has full control of the traverse and automatic feed engagement of the tool heads, the cross rail elevating, lowering and clamping, as well as control of the table for setting up work from whichever side of the machine is more convenient. The side heads have independent electric feed, also rapid power traverse for raising and lowering. The side head tool can be brought up close to the rail head tool. Also, the rail head and side head tools are in the same vertical plane so that extra length of stroke is not required when using the side head. All driving gears in the bed and the table rack are made of steel and are of the Maag type. They run in oil, and in addition have oil pumped through directly to them. The oil pump is driven from the driving gears in the bed and also furnishes forced lubrication to the table ways. These machines are made in sizes from 36 in. to 72 in.



Machine for Filing and Beveling Cross-Cut and Rip Circular Saws

WARDWELL MANUFACTURING COMPANY
110-112 Hamilton Avenue, Cleveland, Ohio

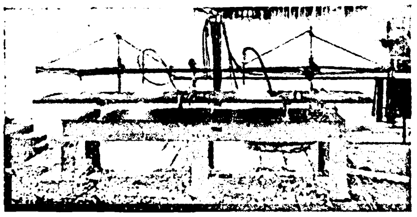
FILING and beveling cross-cut and rip circular saws of diameters from 6 in. to 18 in. can be done by the model Y machine shown. It can be operated by a direct-connected motor or belt drive as desired. This machine will automatically sharpen saws at a speed of 70 ft. per minute and it is claimed that hand work cannot equal it in accuracy.



No. 1A and No. 2 Oxygraph

AIR REDUCTION SALES COMPANY,
342 Madison Avenue, New York City

CUTTING of steel of any thickness from ¼ in. to 20 in. is accomplished with speed and precision on the Oxygraph. The pantograph principle is employed with a motor-driven cutting torch, to copy a drawing, pattern or templet. The pantograph frame of the No. 1A Oxygraph supports a machine torch and an electric motor driving a tracer wheel which acts as a tractor to propel the pantograph in any horizontal direction desired. The relation between the tracer wheel and the machine torch is such that a drawing or pattern is reproduced to half scale.



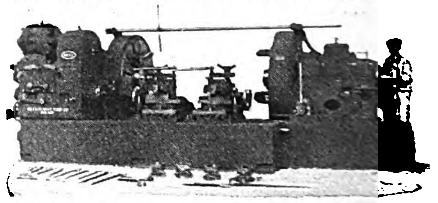
The No. 2 Oxygraph shown is designed for larger and heavier work and has two pantographs which support a horizontal bar mounting one or two machine cutting torches, the motor and the tracer wheel. Designs are reproduced on the No. 2 Oxygraph to full scale. Machine torches of great power have been developed for oxyacetylene and oxyhydrogen cutting with the Oxygraph that operates successfully on the heaviest work.

The cutting action of the torch flame is smooth and rapid, and as any shape can be cut it is comparable to a metal saw of great power, capable of cutting steel 15 in. thick at the rate of 4 or 5 in. per minute, following straight lines, curves and angles, acute or obtuse. Cutting may be started at the edge or within the edge of a piece if conditions require it. The Oxygraph torch flame quickly perforates and thus the cost of drilling and handling is saved. The edges of the cut pieces are square and smooth and in many cases no machining is required for finish. If extreme accuracy is required, the cutting can be done so close to the line that the machining is a light finishing operation only.

Wheel Lathe

NILES TOOL WORKS COMPANY,
Division of Niles-Bement-Pond
Company, Hartford, Conn.

WHEELS from 18 in. to 42 in. diameter on the tread can be turned in this machine. The bed is of a box section casting strengthened by box braces. On the bed are mounted two heads and the tool rests. The left-hand head carries the main driving mechanism, whereas the right-hand head is movable along the bed by a ratchet lever. This head is adjusted to a sliding fit and is clamped to both sides of the bed by a single lever. All driving gears are inclosed and are provided with an automatic lubricating system. The headstock is so arranged that either d.c. or a.c. drive box may be applied.

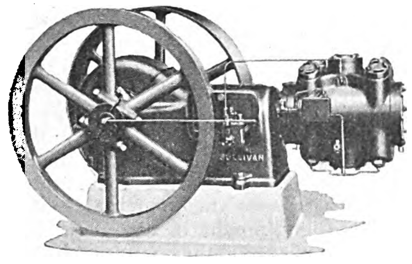


The faceplates are mounted on spindles. T-slots carry the semi-automatic sure-grip drivers which engage the tires directly and enable the full power of the motor to be utilized at the tools. Thrust of the faceplates is taken by the rear spindle bearings with three friction washers. The left-hand faceplate has fast speeds for facing hubs and turning journals or boring car wheels. However, special attachments are necessary for these operations. The faceplates are driven by bolted gears, which engage with steel pinions mounted on a shaft that extends through the center of the bed. The tool rests have in-and-out adjustment on their bases, which in turn have longitudinal adjustment on the bed. The feed is positive and the range per revolution of faceplate is obtained by six feeding strokes, giving practically a continuous speed. A calipering attachment enables the operator to measure the diameter of the wheel without leaving his position at the tool post. All exposed gears are guarded. The machine can be driven by belt or by a variable or adjustable speed motor, as desired.

Belt-Driven Air Compressor

SULLIVAN MACHINERY COMPANY
122 South Michigan Avenue, Chicago, Ill.

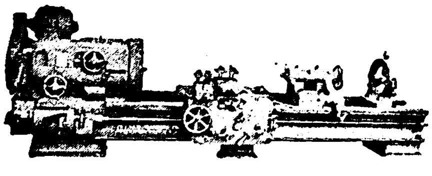
ONE of a line of single-stage wafer valve-type air compressors is shown herewith. The single air cylinder carries the belt pulley on one end and a flywheel on the other. The connecting rods are of open-hearth steel, and are strong and reliable. The babbitt linings are made in halves, and the connecting rod is furnished with wedge-adjusted bronze boxes. The die-cast babbitt bearings of the shaft are carried by seats, facilitating replacement. All parts are accessible. The air cylinder and head are water-cooled. Air cylinder lubrication is accomplished by means of an oil pump connected to the crankshaft. All other moving parts are lubricated by the splash system. An automatic unloader assures constant air pressure. Where the floor space is limited, an idler pulley and bracket can be furnished. These machines run in capacity from 68 to 1,472 cu.ft. They are rugged, simple, compact and economical to operate.



Geared Head Engine Lathe

MANNING, MAXWELL & MOORE, INC.,
Putnam Machine Works, Fitchburg, Mass.

POWERFUL and heavy lathes of this type are made in sizes 36 to 42 in. The deep box section bed is designed with a longitudinal central truss having a cast rack against which the tailstock is braced. The headstock can be driven by a belt, a constant speed motor or an adjustable speed motor. It is of the all-geared type, entirely inclosed, and driven through a friction clutch, mounted on the initial driving shaft. The machine is started and stopped from the apron. Eighteen spindle speeds of a selective type are obtained by the manipulation of only three levers. The headstock contains eighteen gears to obtain the eighteen spindle speeds. A pump provides oil for lubrication of all bearings and gears. The pump and oil tank are located externally on the back of the lathe.

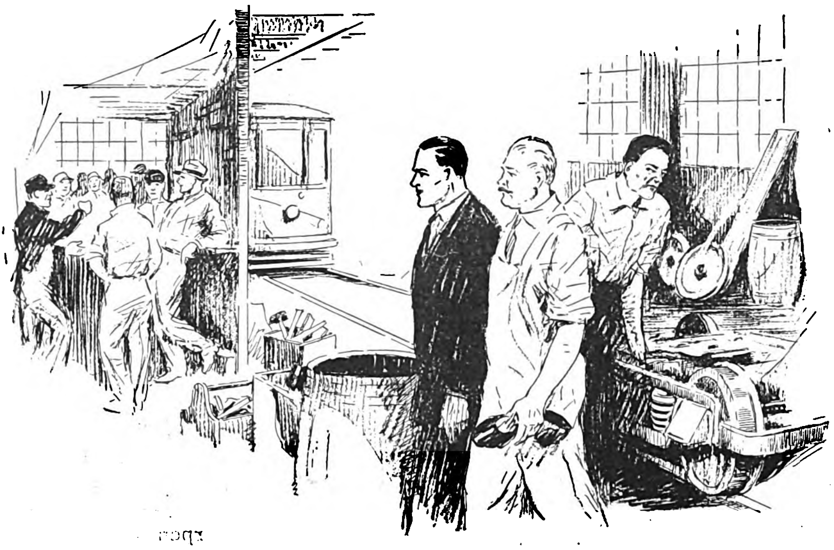


The tailstock is kept in alignment with the head by an inverted V on the rear and has a flat bearing on the front. It has a floating binder to insure correct alignment of the spindle. The four clamping bolts are all operated from the front or working side of the machine. The tailstock is equipped with a side bracket with gear attachment to move it along the bed. The carriage is scraped to fit the entire length of the bed. Each machine has a screw cutting dial, so that all threads can be cut without reversing the lead screw. The compound rest has a swivel base and is graduated in degrees. A unit quick change gear box is bolted and doweled to the front of the bed. It provides 32 changes of threads and feeds in connection with the gearing from the headstock. The steady rest, as regularly furnished, has a capacity of 2 in. to 15 in. diameter on the 36-in. lathe, and from 4 in. to 20 in. diameter on the 42-in. lathe.

Taper attachments, rapid power traverse, cutting compound, circulating system, or metric screw cutting equipment can be furnished if desired.

Dick Prescott Faces the Issue

With Some Misgivings



DICK PRESCOTT, assistant superintendent in the Consolidated Railway & Light Company's shop, quickly realized the seriousness of the situation which Bill Johnson, truck shop foreman, reported. The men refused to go to work. So Steve White, his old friend, the carpenter shop foreman, had been right! Those murmurings he had heard among the men had meant real dissatisfaction and not merely idle gossip of loose tongues.

There was suddenly in Dick's mind an intense feeling of depression and weariness. He had tried to play fair with the men and was thoroughly unprepared for anything of this sort. Had he expected too much? Had he relied too much on his faith that men like to work in a well-managed shop and will take pride in being part of a progressive organization?

"Surely this can't be true," thought Dick. "These men are not objecting to the improvement in efficiency and methods which have been made in the shop. No man with the slightest pride in his make-up would be content to go back to the old shipshod and wasteful methods. I am sure that some of these fellows were getting really enthusiastic about the new order of things and the improvements that have been made in the shop."

There Dick was baffled. He was at a loss to explain any cause of dissatisfaction. Nothing had been done which was not obviously for the improvement of service, reduction of cost or elimination of needless loss in time. Apparently something had suddenly gone wrong. There must be some misunderstanding. Dick refused to lose his confidence in the men and in their fairness of mind when given an opportunity to understand that their interests and those of the company were identical.

These thoughts flashed through the young assistant superintendent's mind quickly. For a moment only he sat silent after Bill Johnson had bluntly reported trouble among the men. There came the idea of appealing to his superior, Tom Mullaney, for aid. He longed for an opportunity to consult with Steve White. But Johnson stood at his elbow and Dick refused to show even the slightest sign of weakness in dealing with this first real test of his ability as an executive. He had been fair and square with the men and he decided to face the issue with them directly, taking the full responsibility for his action.

"Just what seems to be the trouble, Bill?" he asked, calmly.

"Don't know," replied the truck foreman. "Men standin' around lookin' at each other, but won't go t'work."

Dick suspected that Johnson knew more or suspected more than he was ready to talk about. "All right," he remarked, "I'll go right down with you."

As the two men walked into the truck shop, Pete Welsher, shop inspector, whose underhanded work had finally brought on real trouble, puttered around a truck in the far corner of the shop with a sneer on his face.

"Now let's see what this smart young bird's goin' to do," he muttered to himself. "He didn't learn nothin' about this in college, I'll bet."

Association News & Discussions

C.E.R.A. Master Mechanics Hold Two-Day Session

Inspect Shops of Pittsburgh Railways, Westinghouse Air Brake Company and Westinghouse Electric & Manufacturing Company—Further Progress Made in Standardization of Freight Equipment

ATTENDANCE at the Pittsburgh meeting of the Central Electric Railway Master Mechanics' Association on May 11 and 12 was the largest since its organization. This was likewise one of the busiest meetings ever held by the association. The two days were crowded full with the business session and inspection trips to carhouses and shops of the Pittsburgh Railways, the Wilmerding plant of the Westinghouse Traction Brake Company and the East Pittsburgh plant of the Westinghouse Electric & Manufacturing Company.

Every minute of time was occupied in covering the strenuous program laid out by those in charge of the arrangements. During the business session reports of standing committees were gone over, discussed in detail and adopted or referred back with suggestions for further work. Much progress was made in determining standards for freight car equipment in interchange service.

Some slight changes in the details of design of the standard C.E.R.A. box car were adopted. The standard length of coupling hose was changed from 22 in. to 18 in. A set of standard car inspector's gages was approved. A. W. Clarke of the American Car & Foundry Company reported progress in getting approval from the Interstate Commerce Commission of standard safety appliances for interurban box cars. Chairman T. H. Nicholl of the standards committee was complimented by President G. R. Green for the exhaustive and carefully prepared report that was brought in by his committee.

A report of the uniform charges committee was read by Secretary Earlywine. This was received with no objections. The arbitration committee, under the chairmanship of J. B. Corderman, brought in a report regarding a dispute on charges between two member companies that had been referred to it. The decision of the committee was approved by the association.

There ensued a discussion of troubles with the Form 12 coupler resulting from the rough handling of trains or the movement of trains longer than the capacity of the coupler. H. Cordell reported that he had materially reduced this coupler trouble on the Chicago, North Shore & Milwaukee Railroad by the use of a heavier draft spring made up of rectangular steel in place of the round material normally used in this model coupler. A question regarding the operation of so-called 3-in. tread cast wheels that do not actually measure 3 in. was raised by A. J. Challeen. It was voted that such wheels should be rejected for interchange movement.

In the inspection of shops and carhouses of the Pittsburgh Railways the new car washing machines developed and being installed by that company proved to be of great interest. Painting processes used by the Pittsburgh property and the Moorite process of paint removal, which was originally applied in Dallas, Tex., and described on page 292 in the Feb. 13, 1926, issue of ELECTRIC RAILWAY JOURNAL, aroused considerable comment.

The morning of the second day was spent in the Westinghouse Air Brake plant at Wilmerding. After going over the plant and inspecting the manufacturing processes the principal features of brake equipment in use on C.E.R.A. freight and passenger equipment were explained, discussed and inspected. Demonstrations of valve grinding were made for the visiting mechanics by expert workmen. Luncheon was served in the Westinghouse Electric plant in East Pittsburgh and the master mechanics were the guests of that company for the remainder of the day. Those parts of the plant which were of most direct interest and which could be covered in the short time available were inspected.

C.E.R.A. master mechanics at Westinghouse Air Brake Company plant, Wilmerding, May 12, 1927

First row, left to right—John B. Wright, West. Air Brake; A. A. Crawford, Youngstown & Ohio River R.R.; N. M. C. Horner, West. Air Brake; R. S. Bull, Pitts. Rys.; T. H. Nicholl, Union Traction Co.; G. R. Green, Chicago, So. Bend & Northern Ind. Ry.; P. V. C. See, Northern Ohio P. & Lt. Co.; E. J. Jonas, Cincinnati St. Ry.; John Zoll, Louisville Ry.; A. J. Challeen, Detroit United Rys.

Second row, left to right—F. G. Hickling, West. Elect. & Mfg. Co.; Charles Gordon, ELECTRIC RAILWAY JOURNAL; Lawrence Wilcox, West. Tract. Brake; A. F. Rolston, Columbus, Delaware & Marion Elec. Co.; J. A. Duffy, M. W. P. P. S. Co., Fairmont, W. Va.; B. A. Hupp, M. W. P. P. S. Co., Fairmont, W. Va.; O. F. Kemper, West. Ohio R.R.; C. F. Dennis, G. C. Kuhlman Car Co.; L. P. Morris, West. Elect. & Mfg. Co.

Third row, left to right—R. E. Miller, West. Air Brake; B. M. Hartsock, West Trac. Brake; A. W. Reddersen, Indiana Service Corp.; J. B. Corderman, Lima Toledo R.R.; F. A. Bundy, Lima Toledo R.R.; C. E. Keefer, Altoona Logan Valley Elect. Ry.; J. D. Barnhart, Illinois Tract. System; W. I. Conant, Ill. Tract. Syst.; M. W. Barnell, Cincinnati, Hamilton & Dayton Ry.; H. Cordell, Chi., North Shore & Mil. R.R.; W. B. Renshaw, and W. H. Beattys, Jr., West Tract. Brake Company.

Fourth row, left to right—F. P. Snyder, Oakwood St. Ry., Dayton; J. A. Robinson, Consol. Car Heat. Co.; A. B. Wood, West. Air Brake; W. M. Bisel, West. Tract. Brake; G. W. Sword, Oakwood St. Ry.; W. G. Brooks, West. Elect. & Mfg. Co.; M. M. Lloyd, Chi., South Shore & S. Bend R.R.; H. J. Meyer, Beaver Valley Tract. Co.; J. W. Osborn, Cleveland, Southwestern Ry. & Lt. Co.

Fifth row, left to right—A. W. Clarke, Am. Car & Fdry. Co.; L. E. Earlywine, secretary C.E.R.A.; Chas. Sigler, Winona Railroad; R. S. Torgerson, *Electric Traction;* B. W. Sullards, Van Dorn Coupler Co.; R. A. Whisner, Dayton-Xenia Ry.; F. Schmitt, South. Ind. Gas & Elect. Co.; J. H. Trissler, Monongahela West Penn Pub. Service Co.; F. C. Martin, Wheeling Traction Co.; R. Boiselle, Westinghouse Tract. Brake Co.

Top row, left to right—O. L. Franzer, Gary Rys.; R. E. Cornwell, C., S. B. & N. I. Ry.; H. F. Coleman, Ind. Service Corp.; T. W. Cox, I., C. & E. Tr. Co., Springfield, Ohio; C. W. Duncan, Greenfield, Ind.; A. Brownworth, L. S. E. Ry., Sandusky, Ohio; C. C. Kantner, Western Ohio Ry.; J. R. Robinson, Monongahela West Penn Ry.; W. L. Margetts, Gen. Elect. Co.

At noon on Wednesday the visiting mechanical men were the luncheon guests of the Pittsburgh Railways and at dinner they were entertained by the two Westinghouse companies. Speakers at the Wednesday evening dinner included W. T. Rossell, general manager Pittsburgh Railways; President G. R. Green, Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad; J. D. Barnhart, master mechanic Illinois Traction System; T. H. Nicholl, superintendent motive power Union Traction Company, and P. V. C. See, superintendent of equipment Northern Ohio Power & Light Company. Lawrence Wilcox of the Westinghouse Traction Brake Company acted as toastmaster.

Mr. Rossell declared that the industry is moving forward and is making progress in many directions. The new cars in Springfield, Mass., and Joliet, Ill., are signs of the times, he said. Every property is making some progress. Each excels in some things. It is important, therefore, he said, that every effort be made to keep abreast of improvements made by other properties and to apply these new ideas. He felt that every progressive management should send its men out on frequent inspection trips. "No one property can lead in all things," he said, "and it is therefore important that we learn from each other." In the effort to improve maintenance practices on the Pittsburgh Railways, it was found that maintenance requirements alone are so complicated and give opportunity for such important economies that it has been considered wise to avoid adding the additional complication of manufacturing activity. For that reason all possible manufacturing work is being eliminated in favor of better organized maintenance.

President Green expressed appreciation of the courtesies extended by both the manufacturers and the Pittsburgh Railways. He called attention to the progress made by the association and to the valuable work which it is doing in facilitating the movement of interchange freight in the entire C.E.R.A. territory. Henry Cordell said that if managers generally understood the value to master mechanics of getting together for the interchange of ideas and the inspection of others' practices meetings of this kind would receive wider support.

The next meeting will be held on Sept. 8, 1927, in South Bend, Ind.

Bus Convention to Be Held at Philadelphia

THE first annual convention of the Motor Bus Division of the American Automobile Association will be held at Philadelphia at the Ritz-Carlton Hotel on June 15 and 16. One of the important addresses will be made by A. J. Brosseau, president Mack Trucks, Inc., and chairman highways committee, National Automobile Chamber of Commerce. Mr. Brosseau will speak on "The Field of the Motor Bus."

Other speakers on the program include H. G. Wells, member Public Utilities Commission of Massachusetts, who will speak on "Interstate Regulation of Motor Vehicles"; F. J. Scarr, consulting motor transportation engineer and formerly in charge of the Pennsylvania Railroad's auxiliary motor vehicle service, whose topic is "The Relation Between the Motor Bus and Steam Railroads"; Prof. Henry R. Trumbower of the University of Wisconsin, formerly economist of the U. S. Bureau of Public Roads, who will speak on "The Economics of Highway Transportation," and C. T. McConnell, vice-president Ohio Motor Bus Association, whose topic is "System a Prerequisite of Successful Bus Operation."

Appointments in Pennsylvania Association

SECRETARY H. A. BUCH of the Pennsylvania Street Railway Association announces that J. E. Wayne, vice-president and general manager York Railways, has been appointed vice-president of the association and S. S. Crane, vice-president and general manager Altoona & Logan Valley Electric Railway, has been appointed to the executive committee.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 31-June 1-2—**Canadian Electric Railway Association, annual convention, Winnipeg, Man.**

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, St. Louis, Mo.**

June 13-16—**National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

June 15-16—**American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Canadian Convention Program Announced

DETAILS of the program for the 23d annual convention of the Canadian Electric Railway Association have been made available by Secretary Eustace Smith, Jr. Headquarters will be at the Fort Garry Hotel, Winnipeg, Manitoba, and the convention will be held in the Winnipeg Rink.

Sessions will begin at 10 a.m. on Tuesday, Wednesday and Thursday, May 31, June 1 and 2. The program follows:

Tuesday, May 31

9 a.m. Registration.
10 a.m. Business meeting.
11 a.m. Reports of committees: Motor bus and truck; safety and accident prevention; rail corrugation; publicity and merchandising of transportation.
12:30 p.m. Discussion of timely topics: "Car Inspection and Noise Reduction," led by C. Comba, Calgary, and J. E. Watkins, Winnipeg.
1 p.m. Luncheon; official welcome by Mayor R. H. Webb; address by a representative of the American Electric Railway Association.
2:30 p.m. Inspection of exhibits.
4 p.m. Trip to Windsor Park golf course.
9:30 p.m. Supper dance, Fort Garry Hotel.

Wednesday, June 1

9 a.m. Paper, "Economical Distribution of Power," by A. J. Westman, Montreal.
Discussion led by R. A. Brown, Calgary.
11:30 a.m. Discussion of timely topics: "Methods of Conducting Energy-Saving Campaigns," led by D. W. Houston, Regina, and F. D. Burpee, Ottawa.
Trolley Wire, Relative Merits of Phosphor Bronze and Cadminum," led by J. F. Neild, Toronto, and E. V. Caton, Winnipeg.
12:15 p.m. Paper, "Electric Railway Freight Handling," by T. H. Stoffel, Westinghouse Electric & Manufacturing Company.
1 p.m. Luncheon; Speaker, Carl W. Stocks, editor BUS TRANSPORTATION.
2:30 p.m. Inspection of exhibits.
7:30 p.m. Cabaret dinner-dance, Fort Garry Hotel.

Thursday, June 2

9 a.m. Paper, "The Development of Miscellaneous Revenue," by W. H. Boyce, Pittsburgh, Pa.
Discussion led by C. H. Dahl, Winnipeg, and G. E. Waller, Hamilton.
11:45 a.m. Discussion of timely topics: "Depreciation of Buses and Trucks, by Age or Mileage," led by D. E. Blair, Montreal, and W. A. Ernst, Grand River.
"Zone Fare Collection on Interurban One-Man Cars and Buses," led by H. E. Weyman, Levis, and M. C. McElligott, Canadian Cleveland Fare Box Company.
12:30 p.m. Election of officers and general business.
1 p.m. Luncheon.
2:30 p.m. Inspection of exhibits.

For the entertainment of the ladies on Tuesday, there will be an automobile trip beginning at 4 p.m., returning to Fort Garry Hotel for tea. On Wednesday automobiles will leave the Winnipeg Rink and the Fort Garry Hotel at 11:30 a.m. for the Motor Country Club, where luncheon will be served.

In connection with the convention there will be exhibits of electric railway and bus equipment. Some 25 exhibitors already have reserved space of approximately 10,000 sq.ft.

The personnel of the exhibits committee is F. J. Pratt, purchasing agent Winnipeg Electric Company, chairman; E. H. Smith, Canadian Westinghouse Company; Norman Franks, Canadian General Electric Company; A. L. Brown, Northern Electric Company. C. H. Clancy, Toronto, is director of exhibits.

The entertainment committee consists of M. C. Gilman, Winnipeg Electric Company, chairman: F. A. Becker, Canadian General Electric Company; G. E. Miles, Canadian Westinghouse Company; D. D. O'Toole, Northern Electric Company; W. H. Reynolds, E. F. Phillips Electrical Works, Ltd.

An innovation this year is a booth in which will be displayed statistical charts, publicity data, bulletins, etc., which have been issued by the association during the year. The booth will be in charge of J. C. Barker of Toronto.

Radio Interference Studied in New England

RADIO interference and public relations problems featured a well-attended and enthusiastic meeting of the New England Street Railway Club at Boston on May 12. Much discussion occurred concerning practical methods of making the fan's life happier through location of faults in his own equipment and the improvement of operating conditions on cars and lines. President Robert B. Stearns occupied the chair. The meeting was held, as usual, at the Copley Plaza Hotel and brought out a large number of operating men interested in radio reception and the effect of various classes of disturbance upon it. Following the regular dinner, Hon. Lewis Goldberg of the Massachusetts Department of Public Utilities gave a straightforward address upon public relations, outlining the problem of bus versus street car service as it confronts the commission, pointing out the policies leading to the development of good public relations and emphasizing the economic aspects of the Massachusetts system of rate regulation, with special reference to the determination of the rate base in public utilities. Conspicuous in the afternoon proceedings was an address by C. W. Horn, superintendent of radio operation Westinghouse Electric & Manufacturing Company, outlining recent progress in the radio art. Written discussions were contributed by James Thompson, signal department, United Electric Railways, Providence, R. I.; J. B. Crawford and Harry Elliott of the Concord Electric Railways, and E. F. Bickford, electrical engineer Eastern Massachusetts Street Railway, Boston. Abstracts of these papers and discussions will appear in a later issue.

Transportation to Canadian Convention

PREPARATIONS have been made to attach a special car to the Canadian National Railway train leaving Toronto at 9 p.m., Eastern standard time, on Saturday, May 28, for Winnipeg. The train will arrive in Winnipeg about 10 a.m., Monday, May 30. There will be a reduction in fare on this train if ten or more applications are received. Those desiring accommodations should communicate at once with Eustace Smith, Jr., secretary Canadian Electric Railway Association, Toronto, Canada.

Arrangements have been made so that exhibits may be shipped from the United States in bond duty free for exhibition purposes only. Shipments should be addressed to the exhibitors, care of Winnipeg Rink, Langside Street, Winnipeg, Manitoba, for C.E.R.A. convention. Notification should be sent to George H. Young & Company, customs brokers, 303 Confederation Life Building, Winnipeg, accompanied by two invoices. Further information can be obtained from Chairman F. J. Pratt of the exhibits committee, Winnipeg Electric Company.

American Association News

T. and T. Program

THE program committee of the Transportation and Traffic Association held a meeting at the office of the Cleveland Railway on May 6. Those present were: W. H. Boyce, chairman; A. R. Myers, Paul E. Wilson, W. F. Weh, R. W. Emerson and J. W. Welsh. The committee discussed plans for the coming convention and finally agreed on a number of recommendations which it will make to the executive committee of the Transportation and Traffic Association at its next meeting. If the recommendations of the committee are approved the major part of each session will be devoted to discussion of one of the reports of the three major committees. It is planned to devote Monday to bus operation, Tuesday to traffic and safety and Wednesday to service betterment.

A suggestion will be made that a very brief entertainment period be provided for each session, probably in the form of a musical recital. In addition one or more speakers will be scheduled for each session. It was also suggested that at one of the sessions a demonstration be given of the bus schools of the Northern Ohio Power & Light Company.

If the plan of the program committee is carried out the committee reports will neither be read nor approved, but instead the program committee will list the outstanding points or phases of the report as topics for discussion with a predetermined list of speakers.

Purchases and Stores

WITH almost a full attendance, the committee on purchases and stores met at association headquarters in New York City on May 16. Among the important subjects discussed were: "Review of Existing Purchases and Stores Section of the Manual for Revisions and Correction"; "Continued Study of and Recommendations Regarding the Disposal of Unused Inactive Material"; "Study of Routine Methods to Be Followed in the Purchase and Stores Department Recommending that a Report be Made on the Uniform Method of Distributing Material by Supply Trains or Trucks"; "A Uniform Practice of Testing or Inspecting Material on Receipt or at Factory."

After some discussion and favorable comment, the sub-committee's report on subject No. 2, "The Disposal of Unused and Inactive Material," was permitted to stand as previously adopted.

When discussing subject No. 3, which included a routine method to be followed in receiving, tracing and expediting material, a letter from W. E. Scott of the Philadelphia Rapid Transit Company was presented in which he urged that it should be the function of the stores department to follow up and expedite the delivery of material. Mr. Scott was sustained in his argument by C. A. Harris of the Philadelphia Company. So important were the points brought out by these committeemen that Chairman Fleming suggested that their remarks form the basis for a minority report to be submitted at the next annual convention of the association.

At the afternoon session the question of testing and inspecting materials caused considerable discussion, especially that portion of the sub-committee's report which recommended that the stores department assist in the inspection and testing of minor materials. It was held that although the function of major tests rested with the engineering departments of the individual companies, the stores department could be of assistance. After deciding not to specify what materials the stores department should test and with a slight alteration in the text the report was allowed to stand.

The following members were present: J. Fleming, chairman; John Y. Bayliss, A. S. Duncan, A. L. Fischer, B. W. Forkner, A. E. Hatton, F. A. Jordan, T. H. McGarry, A. A. Ordway, W. E. Scott, and W. J. Walker.

Overhead Current Collecting Devices

SPECIAL rolling stock committee No. 11, overhead current collecting devices, held a meeting at the Engineers' Club in Philadelphia, Pa., on May 3, 1927. There were present at this meeting H. Savage, chairman; H. S. Murphy, W. C. Klein and D. L. Smith.

The committee has sent out a questionnaire to the member companies to obtain information on the collection devices used by them at the time of the meeting. A number of replies to this questionnaire had been received. These replies were read and discussed in detail. It was finally decided to arrange the information obtained in a condensed form for presentation to the standing committee on rolling stock at its meeting to be held on June 7 and 8 at the association headquarters in New York City.

The News of the Industry

Figures of Oakland Value

Present Reproduction Cost Put at $40,626,426 by Company's Engineer—Fare Hearing June 21

An adjourned hearing on the application of the Key System Transit Company, Oakland, Cal., for permanent higher rates was held before members of the California Railroad Commission in Oakland on May 10. After valuation figures had been presented, further adjournment was granted until June 21. At that time reports of the engineers of the Railroad Commission will be filed and further testimony taken.

Richard Sachse, consulting engineer for the company, presented figures showing that the present reproduction cost of the Key System is $40,626,426; $29,163,200 on a reproduction cost less depreciation, and $29,987,074 on the historical reproduction cost system. Mr. Sachse said:

> It may fairly be said that with the completion of this detailed inventory the question of the fair value of the property has been answered. The problem will no longer be as to what the Key System is worth and what constitutes a reasonable return on such an unknown quantity, but rather on how the public service that the company is rendering with an unquestioned investment of more than $30,000,000 can be made self-sustaining. This problem becomes still more important when it is remembered that a street railway business, even more than other going concerns, cannot stand still, but that continual large capital expenditures must be made.

The survey completed by Mr. Sachse cost $100,000. It describes every piece of property owned by the Key System as it existed on Dec. 31, 1926. The work was so carried out that it will be possible from now on for the company to keep its inventory up to date.

C. C. Vargas, comptroller of the company, showed that the net return for last year was $1,200,000 and that it will not be more than half of that this year, making it necessary for the company to pass the dividend and enabling it to pay only interest on bonds.

There was no discussion at the May 10 hearing on the question of fare readjustment. This will come up at a later date. The East Bay cities oppose higher rates and have gone on record against the present 7-cent railway and 21-cent ferry fares.

The spring elections have just been held and new city officials chosen in Oakland and Berkeley and it is probable that the new officials will ask for further adjournment on the ground that they want more time to study the case.

Officials of the Key have intimated to civic leaders that they may offer a compromise on the fare question. One plan being considered is the mileage system of assessing fares.

No definite proposition has as yet been officially made, but it is understood that something of the kind is being considered. The company says that it is losing money on the operation of its bus lines and on its "long riders."

At the present time it is possible for passengers to ride from San Leandro to Berkeley and Albany for a 7-cent fare. This may be changed, so as to put the city into zones, with a graduated scale of fares.

Contracts Let for Westchester Extension

The New York, Westchester & Boston Railway will undertake at once to extend the double-track, all-electric lines of its eastern division to Rye, N. Y. Contracts for the job have been let to the engineering firm of Dwight P. Robinson & Company, and the work is expected to be completed within a year.

During the past three years the railroad has instituted all night service and special commuter express trains on all its lines in Westchester. It has authorized the extension of tracks and passenger accommodations at its Harlem terminal, and through its subsidiary, the County Transportation Company, it has inaugurated in Westchester a system of motor coach lines to serve newly developed suburban communities, L. S. Miller, the president, has pointed out.

Enabling Legislation Introduced

Chicago Surface and Elevated Lines Finally Agree on Unification Plans —Bills Presented to Legislature Call for Transfers, Subways, Home Rule, Indeterminate Permits and Provision for City Acquisition

IN THE brief period of an hour last Tuesday morning, May 17, Chicago appears to have moved closer to a complete and harmonious settlement of its troublesome traction question than in all the recent months of unavailing talk and fruitless negotiations. For no sooner had word been received from Springfield that five traction bills had been introduced seeking the necessary legislation to make effective the various franchise fundamentals recently discussed by city and traction officials than announcement was made in Chicago that a plan for a merger had been agreed to by representatives of both the surface lines and the elevated lines.

The traction bills presented by Senator Barr in behalf of the two transportation companies differ in some respects from those recently framed by Corporation Counsel Samuel Ettelson at the instance of Mayor Thompson, but they embody principles fully agreed to by the Mayor during conferences in recent weeks with traction executives and bankers. The bills themselves merely represent the efforts of the companies to make their consolidation plan legal. Since Mayor Thompson's return to office, all of the differences between the companies which have heretofore slowed up progress appear to have been settled.

If the legislators should pass—prior to their adjournment next month—the necessary legislation provided for in the five bills and the companies are consolidated, there will then remain the negotiation of a franchise ordinance between the city and the companies, and finally a public referendum on the ordinance some time in the fall. Both Mayor Thompson and Governor Len Small have indicated that they will not support traction legislation unless a referendum is provided for. Adoption of the program as it now stands would mean that Chicago would have unified local transportation service with universal transfers between street cars, elevated trains, buses and subways, the latter to be built by the city by means of special assessments and use of the present $50,000,000 traction fund. The City Council would dictate the terms of the ordinance, but would relinquish control of service to a county transit commission.

Except for the modified home rule provision, the traction bills, as formulated by the companies, reflect the same stand taken by traction representatives and bankers throughout negotiations with the city during the past six months. In seeking legislative enactment of the terminable permit plan in place of the twenty-year franchise now allowed by state law, however, the companies acquiesced to the creation of a local Cook County transit commission of five members, two to be appointed by the Governor of the state, two by the Mayor of Chicago and one by the county board.

The transit commission, which would be made a part of the state department of trade and commerce, would control all public utilities in Cook County, of which Chicago is the hub, just as the Illinois Commerce Commission now controls all utilities of the state. The plan is a variation of the metropolitan transportation district proposal offered by Mayor Thompson during his last administration, a plan that failed of adoption by the Legislature by two votes. Members of the new commission would be residents of Cook County and would serve four years, each to receive a salary from the state of $12,000 a year, with a secretary at a salary of $7,000.

The legislative program provides for

the major details of local transportation and rapid transit development in Chicago and suburbs as follows:

> Unified operation of all local transportation facilities—surface lines, elevated lines and omnibuses.
>
> Transfers between surface lines and rapid transit lines at convenient connecting points.
>
> Subways to relieve downtown congestion and facilitate rapid transit.
>
> Immediate development of rapid transit service to localities now suffering for lack of it.
>
> "Home rule" control, regulation and supervision of local transportation by a Cook County transit commission.
>
> "Indeterminate permits" instead of twenty-year grants, in the case of all future street railroad grants by the City Council.
>
> Retention of the city's right to prescribe the terms and conditions of any grant, including provision for acquisition of the local transportation system.

The legislation required for giving effect to this comprehensive program is covered in five bills which provide:

Subways

Bill No. 1 authorizes the city of Chicago to build subways, to be financed wholly or in part by general bonds, special assessment, of use of the city's traction fund, and to lease the same on such terms and for such length of time as the City Council may deem wise. The expense of removing or relocating existing underground utility facilities which may be in the way of a subway is assumed in the first instance by the city but with the right to provide for its reimbursement from lessees of the subway: this, to avoid long drawn out disputes and possible litigation with other utilities.

Indeterminate Permits—Municipal Ownership

Bill No. 2 amends the cities and villages act of 1872 by dropping the twenty-year limit on future street railroad grants and by providing that frontage consents will not be required for putting tracks in subways.

Bill No. 3 applies the terminable, or indeterminate, permit principle so generally approved in current discussion. It provides that future grants of authority to construct and operate, or maintain and operate, a street railroad shall continue in force until the property is purchased by the city or until terminated for nonuser or misuser, according to law.

This leaves to the city the right to prescribe, in any grant, such terms and conditions as it may see fit, except that the grant may not be for a fixed term of years and that the terms and conditions may not be inconsistent with the laws relating to public utilities.

The indeterminate permit provision is necessary to meet the financial requirements for carrying out the program for unification and development of local transportation in Chicago. It does not affect existing unexpired franchises, but applies only to future grants.

For Unified Local Transportation

Bill No. 4 permits a single company to acquire and own the street railroads, the elevated lines, the bus lines and other local transportation facilities. It is expressly provided that nothing in the Act shall be construed to authorize street railroad construction or operation without the consent of the local authorities in city, village or incorporated town.

Home Rule Regulation

Bill No. 5 provided for a Cook County transit commission of five members, having jurisdiction over the proposed unified company and all of its lines.

Local responsibility—"home rule"—is assured by providing: (1) That all five members of the commission shall be residents of the county and (2) that two of them shall be named by the Mayor of Chicago and one by the county board. The other two are to be named by the Governor.

In this connection it is explained that in Cook County ten of the fifteen members of the county board are voted for and elected only by citizens of Chicago. Therefore, three members of the Cook County transit commission—two named by the Mayor of Chicago and one by the county board—will always be directly responsible to the people of Chicago. All expenses of the county commission will be borne by the state and these expenses will be subject to approval by the Governor.

The county commission also meets the necessity of recognizing the physical facts of Cook County. There are now in the county, outside of Chicago, more than 85 cities and villages. Many of them are large sized communities, already served by the elevated lines. The future growth of this great metropolitan district will disregard corporate limits and will undoubtedly require extensions of lines throughout the district outside of the city of Chicago.

The point is made that a law giving to the Chicago City Council the power of regulation over a company serving many other cities and villages outside of Chicago would be of doubtful legality to say the least. Nor would it be practicable to have the company's lines regulated in part by the city and in part by the Illinois Commerce Commission. The bill is regarded as the nearest approach to home rule that is both legal and practicable.

A statement signed by Henry A. Blair, president of the Chicago Railways, Britton I. Budd, president of the Chicago Rapid Transit Company, and Leonard A. Busby, president of the City Railway, says:

> The bills have been drawn to meet the necessities of the peculiarly complex and "special" traction situation in Chicago, without contravening the state's constitutional prohibition of special or class legislation. They contain no "jokers." They meet the peculiar complexities of the Chicago situation without disturbing existing conditions in other parts of the state; and they are, at the same time, practicable for application in other parts of the state if circumstances comparable to those of Chicago ever arise there.

As yet Mayor Thompson has offered no definite legislative program, but insists that any solution must assure good service, just wages, decent working conditions and a fair rate of return on actual investment. The Mayor's attitude toward home rule closely approximates the plan put forward in the companies' legislative bills. A public hearing on the three traction bills prepared some time ago by the Corporation Counsel's office at the direction of the Mayor, will be held by the joint senate and house committee in Springfield about May 25. The bills provide for consolidation of elevated, surface and bus lines and for the terminable permit plan as a substitute for the present twenty-year franchise.

Poughkeepsie Recognizes "No Accident" Employees

A marked falling off in accidents is the result of a three months "no accident" contest carried on the lines of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y. The plan is to be continued for another three months campaign.

Prizes of $5 for each member of the winning crew were awarded on May 3 when the men received their pay envelopes. There were seven men on the losing crew who had clear records during the period covered in the contest and consolation prizes of $2.50 were awarded each man. Captain Rhodes of one of the winning crews entered the employ of the company 37 years ago as a horse car driver. E. Schoonmaker, captain of the other winning crew, has been in the employ of the company for more than twenty years.

George W. Wells, general manager, said that the majority of the accidents reported in the past three months were due to motorists driving away from curbs without giving the proper warning signal to the motorman; that there were few accidents involving pedestrians and bicyclists.

Paving Law in Arkansas Upheld

In a decision rendered on May 16 the United States Supreme Court held that an act of the Arkansas Legislature which in effect compelled the Fort Smith Light & Traction Company to bear the expense of certain street paving in Ft. Smith, Ark., was not an arbitrary or unreasonable exercise of the legislative functions.

Under authority of an act of the Arkansas Legislature of 1919, amended in 1921, the utility surrendered its franchise to operate in Fort Smith for an indeterminate permit to operate subject to regulations of a utilities commission. The franchise provided that it should pay the cost of paving streets between its rails and to the end of the ties, and limited its fare to a maximum of 5 cents.

In 1923 the Legislature enacted a law requiring street railways under certain conditions which were met in this particular case, to pave between their rails to the end of the ties and which empowered improvement districts to do the paving and charge the cost to the railway in the event the companies refused to do the work themselves. The Fort Smith company was asked to pave certain streets under this law and refused, whereupon the work was done by the Board of Improvement of Paving District No. 16 of the city of Fort Smith.

The company resisted an attempt to make it pay and the suit resulted. The company claimed that the law of 1923 was unconstitutional in that it was an impairment of a contract. It also charged that the law was so phrased as to apply only to this particular railway in Arkansas.

The Supreme Court held that the act was not arbitrary or unreasonable. It pointed out that while the law of 1919, under which the company surrendered its franchise and obtained an indeterminate permit, did not provide that the company should defray the cost of paving, at the same time it did not exempt the company from such charges and that it was not unconstitutional for the act of 1923 to be so framed as to apply only to the Fort Smith company in effect.

New York State Wage Conferences End

Wage conferences between James F. Hamilton, president of the New York State Railways, and the Rochester-Syracuse-Utica, employees' agreement committee ended on May 18. The result will be submitted to the employees for a vote on May 25. Officials declined to give out the result of the negotiations. The men sought an increase of 9 cents an hour.

Question of Suburban Fares Raised in Cleveland

By the terms of a franchise which a committee of the City Council of Cleveland, Ohio, has rejected, Cleveland Heights agreed to a rate of fare on the lines of the Cleveland Railway always 1 cent higher than the rate within the city. In return the company contracted to make certain extensions within the suburb. The claim of the Cleveland committee, supported by the street railway commissioner, is that this 1-cent differential is not sufficient to pay the cost of service. It proposes, instead, a differential which in case city riders pay 7 cents, as they do now, Heights riders would pay 10 cents.

The 1-cent differential was recommended by the metropolitan committee. According to the Cleveland *Plain Dealer* it represents what that committee, after a painstaking study, believed was a fair adjustment between city and suburban car riders. How difficult it is to fix transportation costs accurately, however, was acknowledged by the committee, which declared in its report:

> Any attempt to provide service-at-cost for the individual car rider must of necessity produce only an approximate result . . . It is only the imaginary average car rider, the man who rides for an average distance on an average line, who gets his service exactly at cost.

The opinion of the *Plain Dealer* is that if the Cleveland Council attempts to club any suburb into accepting a franchise which the suburb's own judgment thinks unfair—particularly, when the suburb's position in the controversy is indorsed by an authority as good as the metropolitan committee—it will set back the progress of traction peace on which the welfare of the whole community hinges. That paper said:

> Years of increasing difficulties for Cleveland's traction system led to the creation in 1925 of the metropolitan transportation committee and its recommendation of a program of co-operation between the city and the suburbs. That program, widely commended at the time, is imperiled by the attitude of a council committee. If it is destroyed, we will see re-established the same chaotic conditions that alarmed the community previous to 1925 and brought the metropolitan body into existence.

Increase in Fares Asked in Sacramento

The Pacific Gas & Electric Company has applied to the California Railroad Commission for authority to increase fares on its electric railway system in the city of Sacramento, alleging that the present rates and fares are inadequate to produce a fair return upon the investment in the properties. The company asks permission to establish the following passenger rates:

One-way fares on all lines, 7 cents; weekly pass, good over entire system transferable with unlimited use to the holder during the calendar week issued, $1.50; school tickets, to be limited to children under thirteen years of age, and to be accepted only on regular school-days between the hours of 8 a.m. and 4:30 p.m.; special car rate, minimum charge, $5.

Newspaper tariff, 10 lb. per 100 papers, 6,000 papers, $4.50; 11 to 45 lb. per 100 papers, 6,000 papers, $7.50; 46 to 75 lb. per 100 papers, 6,000 papers, $10.50; all over 75 lb. per 100 papers, 6,000 papers, $13.50. Bundles weighing in excess of 40 lb., and not to exceed 150 lb. to be handled only when in charge of messenger paying regular fare.

The company alleges in its application that its railway system has an average historical cost of the depreciable property during the calendar year 1927, in excess of $2,460,000, and that the reproduction cost, as of Jan. 1, 1927, exceeded $3,825,000. Operating revenues during 1926 did not exceed $713,941, it is stated, while the operating expenses were $602,505. The depreciation-fund set aside during 1926 to cover actual deterioration and probable losses was not less than $81,227, leaving a net income of $30,209, or a net return of 1.19 per cent of the historical cost of the 44-mile property.

Tornado Damage in St. Louis

A car washing shed of the United Railways at Spring Avenue and North Market Street, St. Louis, Mo., was unroofed in a near-tornado that swept that city on May 9.

The long arched roof, blown off in one piece, was carried north into St. Ferdinand Avenue, blocking that street. A part of the heavy framework crashed down upon a group of nine steel cars.

Street car service suffered at various points in North St. Louis because of the storm. Company officials report there were 100 interruptions of more or less consequence. These interfered with owl service, but at daybreak cars were running regularly on all but the Manchester and Broadway lines.

The Manchester cars were rerouted via the Market and the city limits lines, while shuttle service was maintained on the west end of Manchester Avenue to Maplewood.

North Broadway was blocked until 10 a.m. in the vicinity of O'Fallon Park and Broadway cars were detoured at Franklin Avenue via the Bellefontaine line to West Florissant Avenue and thence via the Taylor line to Broadway. Shuttle service was maintained on Broadway from Franklin Avenue to Salisbury Street.

Fallen trees, poles and wires were responsible for many troubles. The wind reached a velocity of 72 m.p.h., and its force was so great that iron trolley poles along the Grand Avenue viaduct spanning Mill Creek Valley were bent as if twisted by a giant hand. Many wood poles were snapped in two.

Charles L. Henry Memorial by C.E.R.A.

"Whenever the history of electric railways in Indiana and their extensions in the other parts of the United States is written there will be coupled with their growth and development the name of Charles L. Henry, whose memory will be ever cherished and enshrined in the hearts of a grateful people." This is the concluding sentiment in a memorial and resolution adopted at a meeting of the executive committee of the Central Electric Railway Association at Fort Wayne, Ind., on May 4, 1927. It was resolved that a copy of this memorial be sent to the bereaved family of Mr. Henry and inscribed upon the records of the Central association.

"L" Removal Plan in Brooklyn Deferred

Although Borough President Byrne of Brooklyn was moving to speed action on the removal of the "L" from downtown Fulton Street the problem was relegated to the distant future on May 9 at an organization meeting. Recently the appointment of Matthew S. Sloan, head of the Brooklyn Edison Company, as chairman of a committee of 100 was announced. Forty-two civic organizations, including the Civic Council, composed of the representatives of nearly 100 groups, and the Chamber of Commerce have adopted resolutions demanding the removal of the "L" from the business section downtown. A bill was passed and signed by the Governor giving the city the right to condemn the structure.

In connection with the matter of the consideration of the Fulton Street project the Committee of One Hundred has adopted another resolution. This calls for a petition to be presented to the Board of Estimate urging that body to act favorably upon the plans for the proposed Fulton Street Subway. The resolution also favors the elimination of other remaining elevated roads in Brooklyn after the removal of the Fulton Street structure.

Britton I. Budd Medals Awarded for Saving Lives

The medal for the saving of human life, recently established by Britton I. Budd, within the electric light and power and electric railway companies of which he is president, as an award of honor for any employee who saves the life of any one, anywhere and at any time, was presented recently to two employees of the Public Service Company of Northern Illinois, one employee of the Chicago Rapid Transit Company and posthumously to a late employee of the Chicago, North Shore & Milwaukee Railroad. Those receiving the medals on the electric railway properties and their citations were:

Lyman Dean, deceased, motor coach operator for the Chicago, North Shore & Milwaukee Railroad. On Oct. 25, 1926, Dean was driving eighteen school children, when his coach was caught in the path of a Chicago, Milwaukee & St. Paul Railroad train at Northbrook crossing, near Chicago. Dean remained at his wheel and succeeded in backing the coach far enough off the tracks so that only the front end, where he himself sat, was struck. None of the children was killed. Dean is survived by his wife and three children. Mrs. Dean received the medal from Mr. Budd.

Melville Cover, 21 years old, inspector in the communication department of the Chicago Rapid Transit Company, on Sept. 13, 1926, saved the life of Ralph Grieg, eight years old. The child was brushed from a trestle of the Chicago, Aurora & Elgin Railroad into the Des Plaines River. Cover, who was a passenger aboard the train, saw the lad strike the water and he dived from the train into the river 25 ft. below. He removed the boy to a sandbar and then proceeded to the work of reviving him.

Centralized Train Control on North Shore Line

A new plan of organization of the transportation department of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., was put into effect recently by John F. Egolf, general manager of the railroad. Under this plan the superintendent of transportation is responsible for all activities of the department. The number of men reporting directly to him has been decreased from seventeen to nine, and he is relieved of detailed supervision of one of the divisions. Both these improvements free him for the more important work of directing the operations of the department.

One of the most important changes in organization was the discarding of the three-division arrangement in favor of one division and the placing of control of all train operation on all lines (except in terminals) under a new official, i.e., the division superintendent of main lines. Train operation in terminals and all terminal activities are placed under the control of the division superintendent, Milwaukee terminal; division superintendent, Waukegan terminal, and division superintendent, Chicago terminal, respectively.

Train dispatching is all done from one central point, North Chicago Junction, whereas formerly it was done from two remote points, Milwaukee, Wis., and Highwood, Ill. Train dispatchers are responsible for dispatching and recording the movement of trains, but they are relieved of recording the reporting of trainmen. This reporting is now taken care of by employees at the respective terminals and at Highwood. The chief dispatcher is responsible for train dispatching and for assignment of runs to trainmen.

With this and other details of organization in effect, the operation of trains is unified and authorities and responsibilities are direct and clearly defined. Likewise, the plan is economical, for although additional supervision was provided both at the Chicago and Milwaukee terminals, there are fewer employees under the new plan than under the old.

State Supreme in Revoking Franchises

Under a decision handed down by Supreme Court Justice Crosby at Buffalo, the state of New York is the only legal power that can revoke franchises of the International Railway, Buffalo, N. Y. The decision followed the application of the company for an injunction restraining the municipal authorities from revoking six franchises of the International in various streets of the city for alleged non-compliance with orders of the Public Service Commission. The court, however, entered no final order in the matter and suggested that Frederic C. Rupp, municipal corporation counsel, and Henry W. Killeen, of counsel for the railway, try to agree. If they cannot agree, then the court will enter a final order.

Justice Crosby says the original franchises were granted by the state of New York with the city consenting and says the rights can only be revoked by the state, which granted them. The court held, however, that the city should be permitted to pass any and all resolutions, serve any and all notices and papers and do all things that may be necessary or expedient as preliminary steps to the bringing of a proper action to accomplish the revocation of the railway's franchise.

Report at Cincinnati Favorable to Railway

Electric railways furnish the cheapest and most convenient service for moving large masses of people, says the report of the committee on street railways of the Cincinnatus Association of the city of Cincinnati. Among conclusions set forth in the report are:

> 1. A realization that the competition of the automobile has driven the electric railway out of the field of natural monopoly, and therefore it should hereafter be conducted along lines of a private industry, side by side with independent bus lines, so that the enterprise which gives the best service will eventually win out and drive the other entirely out of the field. Our knowledge of the science of urban transportation indicates that electric railways furnish the cheapest and most convenient service for moving large masses of people and it is, therefore, unthinkable at present that this means should vanish from our cities.
>
> 2. Municipal ownership. Whatever the pros and cons of municipal ownership may be, it is agreed that it could not immediately solve the problem. Furthermore, public ownership and public operation in the present state of laws governing municipal action, and especially in the light of present municipal finances, would make its adoption impossible short of a considerable period of years.
>
> 3. Private ownership and operation on a sound, fundamental basis of regulation and control. On this final alternative in the form of the service-at-cost plan recently adopted after five years of negotiation, is based our hopes for the future.

In referring to the report, the Cincinnati *Enquirer* says editorially that public ownership is a delusion and that the question of how best to co-ordinate the bus and the railway service is the problem which must be worked out.

The pamphlet is published with an introduction by the Cincinnati Street Railway. That company says:

> A short time ago a committee was appointed by the Cincinnatus Association and charged with the duty of making a study of the local railway and general transportation situation with special reference to operation under the city control and service-at-cost plan by the Cincinnati Street Railway. The members of the committee were well qualified for making a careful and disinterested study of the subject and devoted an unusual amount of time and attention to the work. The report of the committee was presented to the association by the meeting of its members, but was not given general distribution.
>
> The Cincinnati Street Railway cannot agree with all of the premises in the report or accept all of its conclusions. Notably, we think that street railway industry is by no means immersed in the gloom that Mr. Lowenberg sees. The industry is looking up in all places. Other than this, the points of disagreement are such as might well arise out of an honest difference of opinion, and the report contains so much of value in the way of information, explanation and analysis of the close and mutual relations between the transportation system and the public that in my opinion it should be made available for wider distribution. The permission of the committee having first been secured, the report is now published in the present form.

This statement is signed by Walter A. Draper, president of the Cincinnati Street Railway. The report of the committee was rendered in the name of Laurent Lowenberg, chairman, and Leonard Smith, Jr.

Sanitary Regulations Fixed by Legislation in Ontario

Passengers on street cars in Ontario are to have roomier and more sanitary rides hereafter. That is the way the newspapers are broadcasting the account of legislation recently enacted. The regulations limit the number of passengers to one and two-fifths of the proper seating capacity, but permit an additional five passengers on rear platforms. They require also a thorough cleaning of the car interiors daily, adequate ventilation, thermometers in each car, celluloid covered straps and cushions that are readily cleaned. Eustace Smith, secretary of the Canadian Electric Railway Association, is reported to have characterized these regulations as too stringent and to have said that "a literal interpretation of them would ruin some companies."

Chicago Students Must Pay for Car Damage

Acts of vandalism committed on cars of the Chicago Rapid Transit Company, Chicago, Ill., were publicly condemned by officials of the Chicago public schools in a recent decision requiring students of the Englewood High School to make full restitution for damage done to the cars of a train on the elevated lines. The occasion was on March 24 when homecoming students riotously celebrated their team's winning of the city basketball championship. Two hundred students boarded the train at a north side station, smashed windows and electric lights and ripped advertising posters from the walls of the cars.

Rochester Subway to Be in Operation by August

That the New York State Railways will operate the municipally built subway and freight line in the bed of the abandoned Erie Canal in Rochester, N. Y., was assured by final action of the Common Council on May 10. The line will be operated for a three-year trial period under general terms of the service-at-cost contract between the railway and the municipality.

The question of who was to operate the subway has agitated Rochester for the past two years. More than a year ago the late Mayor Clarence D. Van Zandt appointed a committee to draft recommendations on the operation of the line after a survey. Some three months ago the committee reported in favor of operation by the railways only after a majority sentiment in favor of the report had been ascertained through public hearings and a poll of industries. Agreement to the proposal had been obtained from the four steam railroads entering the city.

An important function of the city railroad will be its use for freight switching connecting the railroad lines with important industries throughout the city. The subway line will provide high-speed transportation for outlying sections and will direct interurban traffic from the streets, thus helping to solve an important traffic problem. Supervision of the new line will be under City Railway Commissioner Barnes.

Excess Paving Costs to Be Paid by Denver Tramway

The Denver Tramway, Denver, Col., and the city of Denver have been at cross purposes for more than a year relative to the tramway paying a certain amount for street paving. The company flatly refused to pay. The outcome of this and some other matters pertaining to the company and the city is docketed in the federal court. However, on May 5 the tramway informed the city that it would pay the excess cost of paving streets on which it operates cars, it costing more to pave streets on which there are car tracks than those on which there are no tracks.

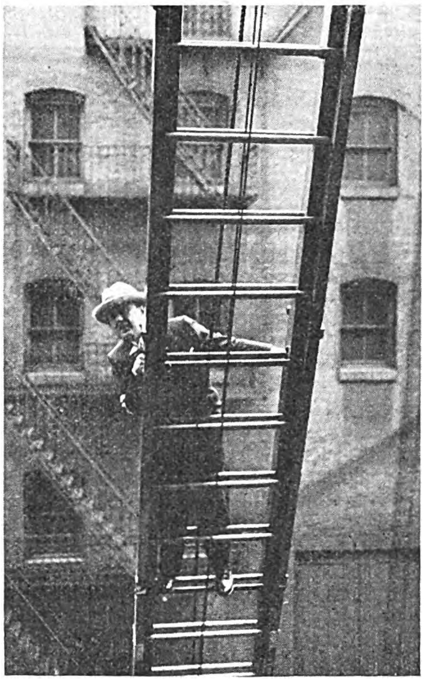
Committee Named to Negotiate Los Angeles Purchase

Following the suggestion of Dr. Delos F. Wilcox, acting in an advisory capacity for the city of Los Angeles, Cal., in the matter of the proposed increase in fares requested by the Los Angeles Railway, the City Council on May 14 named a special committee to negotiate with Henry E. Huntington, the owner of the railway system, or his representative, as to the best price and the most favorable conditions for the acquisition without the necessity of issuing bonds against the general credit of the city. This committee was authorized to ascertain terms upon which the city can procure a standing option to buy the railway lines.

The action of the City Council was not unanimous, there being considerable opposition to the proposition. It was contended that the ownership of the lines of the Los Angeles Railway by the city would mean an actual increase in fares from the present rate of 5 cents to 6 cents or possibly 7 cents. This contention was over-ruled and the committee named.

Engineer Ridgway Talks on Transit in Seattle

The City Council on May 9 unanimously adopted the principle of rapid transit for Seattle, Wash., and requested the rapid transit committee to make further investigation and submit a plan of financing. Robert Ridgway, New York, at the committee's request, arrived in Seattle from San Francisco and spent May 12 going over the ground. That evening a banquet was tendered in his honor by the rapid transit committee. It was attended by the entire City Council, board of public works, comptroller, attorney and treasurer, planning commission and representatives of banks, railroads, port commission, schools, parks and newspapers and by merchants and others, also delegates from about 30 civic organizations. It was impossible for Mr. Ridgway to remain longer. He could not, of course, make a report upon such short investigation, but in response to questions at the banquet stated he saw no faults with the committee's plans. The principal object in inducing him to visit Seattle was to confer upon the city's procedure and consult with him generally.

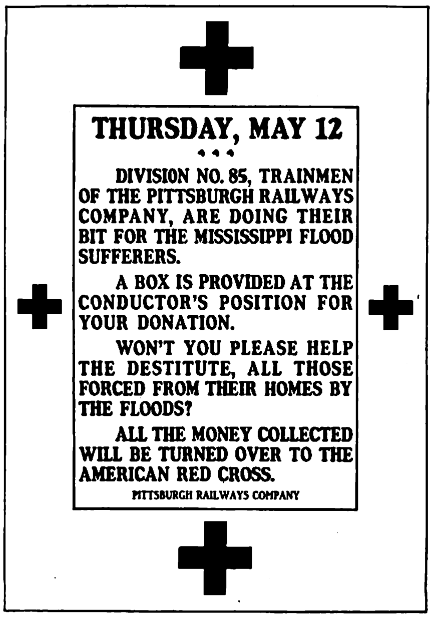


Joe Schenck nears the top in Pittsburgh drive

The Unusual Again in Pittsburgh

Through the opportune presence of the famous motorman-conductor vaudeville team of Van and Schenck, the Pittsburgh Railways was able to enhance its wholehearted Red Cross work on behalf of the Mississippi flood sufferers. On Thursday, May 12, a platform was set up on the street alongside the building of the Philadelphia Company, which controls the Pittsburgh Railways. The 40-piece Railway Employees' band volunteered to play and the Philadelphia Company's quartet to sing between the various vaudeville acts put on by Van and Schenck and other generous artists.

A hook and ladder company, through the courtesy of Richard Smith, fire chief, set up a mighty ladder which Joe Schenck offered to climb rung by rung for every dollar collected by the 25 uniformed railway inspectors. With Gus Van acting as chief barker for his partner, the dollars came in until Joe found himself on the top rung at the sixth story, as a $250 collection indicates.



THURSDAY, MAY 12

DIVISION NO. 85, TRAINMEN OF THE PITTSBURGH RAILWAYS COMPANY, ARE DOING THEIR BIT FOR THE MISSISSIPPI FLOOD SUFFERERS.

A BOX IS PROVIDED AT THE CONDUCTOR'S POSITION FOR YOUR DONATION.

WON'T YOU PLEASE HELP THE DESTITUTE, ALL THOSE FORCED FROM THEIR HOMES BY THE FLOODS?

ALL THE MONEY COLLECTED WILL BE TURNED OVER TO THE AMERICAN RED CROSS.

PITTSBURGH RAILWAYS COMPANY

The appeal of the placard was irresistible

The biggest help from a dollar and cents standpoint came through the action of Division 85, Amalgamated Association, whose trainmen offered to serve as collectors on the cars. To this end, 1,700 Red Cross collection boxes were placed alongside the fareboxes in the cars and a placard displayed in the windows. The Pittsburgh Motor Coach men did likewise. In this way a total of $2,753 was collected, including the returns from street entertainment. So eager were some of the passengers to contribute that they presented car tokens when cash was lacking.

The collection made was not only substantial in itself, but was a splendid advertisement for the cause at large.

Six Cents on All Lines Sought in Los Angeles

Application for an immediate emergency 6-cent fare on all lines operated by the Los Angeles Railway Corporation was filed on May 17 with the California Railroad Commission. A hearing permanently to increase the rate of all yellow lines is now before the commission. The 6-cent rate, according to a statement issued by George J. Kuhrts, vice-president and general manager, is necessary to maintain the present railway system pending the outcome of the present hearing relative to the 7-cent rate hearing.

Mr. Kuhrts says the railway has urged the greatest expedition in the hearing because of its unfavorable financial condition. He said that the company's earnings had further declined and the financial statement for 1926 showed that the company did not earn the interest on its bonds and borrowed money. The estimate for the year 1927 showed that the company would earn even less and fall short of earning its interest charges by about $1,000,000. He added that the railway would be unable to proceed with its plans for the purchase of additional equipment and the carrying out of improvements unless the immediate relief, available through the emergency 6-cent fare, was granted.

More Suburban Electrification Work at Philadelphia

The Pennsylvania Railroad has started the physical work of electrifying its Octoraro branch, extending from Philadelphia through Lansdowne, Morton, Media and Swarthmore to Wawa and West Chester. The first concrete foundations for poles to support overhead wires on the Octoraro branch are now being laid. The work will proceed out the branch to West Chester, a distance of 27 miles.

Steady progress is being made on the electrification work between Philadelphia and Wilmington. All the new larger and higher signal bridges made necessary by the pantographs on top of the electric cars have been installed.

Longer Platforms Speed Chicago Service

Extension of station platforms on all lines of the Chicago Rapid Transit Company, Chicago, Ill., to accommodate eight-car trains has recently been completed. The work started in July, 1925. It cost $701,929. The longer trains and faster operation made possible by this improvement have resulted in a noticeable lessening in congestion and in increased convenience and comfort for riders. At stations on the elevated loop in downtown Chicago as many as three trains may now load and unload passengers simultaneously.

The removal of "L" columns supporting the structure from the center of the street to the curb along Wabash Avenue at intersections has also been completed. This work was undertaken by the company to help relieve traffic congestion in downtown streets. It is part of a three-year program of relocating structure columns in the "Loop" district to be concluded in 1928.

Another Problem in Saturation

The automobile has been its own enemy in urban transportation. For a brief period it robbed public utility carriers of their passengers, but as its use for transportation to the office and shopping zones increased, the traffic problem was created, until today the public is beginning to realize that the individually-owned and operated automobile during business hours is a liability rather than an asset. New York City, because of its geographical restrictions, knows what the saturation point for the automobile will be like, and in that city street car and bus riding has increased. In Detroit, however, a directly opposite condition obtains.

Street railway and bus operators have begun to sense the change. An Eastern city is witnessing an experiment with pneumatic-tired street cars. Even in Washington the sight of luxuriously upholstered buses and street cars, in which one may recline with all the comfort of the fireside chair, is not unusual. Street railway advertising has begun to stress the parking problem as compared with the comfort and convenience of street cars. Mass transportation is bound to be the development of the future, for no other adequate use can be made of every square inch of street surface.—*Washington Post.*

"Zero Hour" Strikes Again in Atlanta

The second "zero hour" drive of the Georgia Power Company in Atlanta is being held from May 10 to May 26 and the Atlanta Safety Council, under the slogan "Help Prevent Accidents," is co-operating in every way to make the campaign more successful. The "zero hour" idea, originated with W. J. Rountree, safety director of the company. It proved so successful in reducing accidents on its first trial some weeks ago that the second drive has been planned, which will have the co-operation of the school department, press and other agencies. On May 10 "zero hour" was fixed from 7 until 8 o'clock in the morning. Since then the "zero hour" has been moved up one hour each day, closing with an hour between 11 and 12 midnight on May 26. During this hour trainmen throughout the city will be particularly careful in their efforts to avoid accidents.

Identification Number Conspicuously Displayed in Detroit

In maintaining a friendly spirit of public relationship, the city of Detroit, Department of Street Railways, believes that the matter of providing a more conspicuous means of identification of its public representatives is an important factor. In furtherance of this plan new badge numbers have been mounted on trainmen's caps, and can be easily distinguished at a distance of 30 ft. or more. The initials and numbers are white enamel and stand out very prominently against the black enamel background. Discernibility is made even more pronounced by the black silk cap on which the badges are worn. On the old type badge the number was so small that it could not be deciphered without close inspection. This was somewhat embarrassing to a patron who might have occasion to report the employee for some offense or possibly commend him for his efficient and courteous conduct. Delivery is now being made on an order for 6,500 of these badges.

Kewanee System Described

The products and activities of the city of Kewanee, Ill., are made the subject of comment in the May issue of *Current Topics*, the official publication of the Illinois Power & Light Corporation. Emphasis is laid on the utility services rendered in the fields of the electric light and power, gas and city railway. All these services are supplied by the Kewanee Public Service Company, which in addition operates the Kewanee & Galva Railway, an interurban line between the two cities.

The Kewanee Public Service Company became affiliated with the North American Light & Power group on Sept. 10, 1926.

Buffalo Men and Management Aid Community Fund

William E. Murphy, president of the International Railway Co-operative Association, announced on May 10 that at a convention of all employee representatives under the Mitten co-operative plan it had been decided that each employee would contribute from his pay to the joint charities drives of the Niagara Frontier. Later, at a meeting of the general committee, representing both employees and employers, it was agreed that the total amount would be matched by the company. The sum so obtained will be distributed in accordance with the budgets of the various drives. Under the new law, the first contribution of $2,500 to the Community Fund was made on May 10. During the campaign every street car in the city carried in space donated by I.R.C. a dash sign reminding citizens of the drive.

News Notes

Drops Five-Cent Fare.—Abolition of the last general 5-cent railway fare in Massachusetts was approved on May 13 by the State Department of Public Utilities. It granted the request of the Union Street Railway, New Bedford, for an increase to 10 cents or four rides for 25 cents. The commission stipulates half fare for school children.

Tramway Rewards Firemen. — The Denver Tramway, Denver Col., sent a check for $100 to the Denver Firemen's Pension Fund. This was in appreciation of the good work done by the firemen when the company's sand elevator caught fire on March 30.

Service to Island Taken Over.—The Toronto Transportation Commission, Toronto, Canada, took over the ferries running to the Island (summer resort and park owned by the city) on March 1. The private agreement had expired, so the city bought both passenger and freight boats, about ten in all. The fare charged is the ordinary railway rate of 7 cents.

Wheeling Citizens to Decide on Paving.—At the general election to be held in Wheeling on May 26 the people will decide whether or not the Wheeling Council should be permitted to contract with electric railways as to their paving obligations. The bill covering changes in the Wheeling charter passed the West Virginia Legislature, but a provision was inserted calling for a referendum vote of the people on such authority. If the referendum carries it means that the Wheeling Traction Company will be permitted to enter into a contract with the city whereby it will place and maintain the concrete base under the tracks while the city will care for surface paving.

Railway Will Pay Toward Bridge Improvement.—The United Railways & Electric Company, Baltimore, Md., again has demonstrated its desire to help bring about improvements in the city. The company has notified the chief engineer of Baltimore, Bernard L. Crozier, that it will pay $10,000 toward a proposed bridge to carry Clifton Avenue over Windsor Mill Road. The new bridge will be of concrete and will be constructed by the city. It will cost about $150,000. The structure will replace a wooden one over which the street cars operate. The United is not required by law or the terms of its franchise to pay any part of the cost.

The Young Visitors.—"Boys' Day in Industry" was heralded in the general offices of the Los Angeles Railway, Los Angeles, Cal., recently when nineteen high school boys representing thirteen high schools visited the plant in an educational tour. A special bus loaned through the courtesy of the bus department conveyed the boys to the South Park shops, where they were introduced to Master Mechanic Stephens, General Foreman of Carhouses William Brown and General Shop Foreman Walter Brown. No part of the plant was overlooked in the quest for knowledge. Now the company is offering the youths who were on this trip $5 for the best essay and $2.50 for the second best essay on their tour of the company's properties. *Two Bells*, the official publication of the company, recommends "hold 'er down to 300 words."

C., H. & D. "News" in Circulation.—At no fixed date, but at intervals more or less irregular, the Cincinnati, Hamilton & Dayton Railway, with operating offices in Hamilton, Ohio, will issue the Cincinnati, Dayton & Hamilton *News* whenever the company has anything worth while to say. This sheet has wide circulation, being distributed not only on all the cars, both city and interurban, but goes forward to members of various trade organizations and clubs in Dayton and Cincinnati, including the women's organizations. Advertisements are run in all of the local papers, briefly summarizing the high spots in the *News* issue and a news story is furnished to the newspapers.

Contention Over Paving Expense.—A paving dispute has arisen in Albuquerque, N. M., over the City Electric Company's refusal to pay for the paving between car tracks and 1 ft. on each side. The city put in the paving and then sued the company for the costs, plus 12 per cent from April 19, 1924, amounting to $32,749. On May 6 the State Supreme Court sustained the city and declared that it had a lien for the amount on the company's property; that unless the company paid, the property would be seized and sold and the city permitted to bid, but not in excess of the amount the company owed.

Wages Remain Same in New Orleans.—The present contract between the New Orleans Public Service, Inc., New Orleans, La., and the union of trainmen will be allowed to stand for at least another year. The contract was signed Aug. 12, 1926, after prolonged negotiations. It is for three years, but either side has the privilege of reopening the question of wage scale prior to May 1 of any year during which the agreement is effective. No request for modification has been made and the time for such request this year has passed.

Tokens in Oakland.—Use of tokens in payment for car rides has been instituted by the Key System Transit Company, Oakland, Cal. These tokens are offered for sale to passengers by conductors at the rate of five for 35 cents. They also will be given as change to those who desire them. President Lester S. Ready said that the token system was being introduced in Oakland and the East Bay cities for the convenience of the traveling public; that an investigation had proved that many of those who patronized streetcar and bus systems preferred to handle one token, representing one ride, rather than three coins. "There also will be a great saving of time in loading the cars during rush hours." he claimed, "for the use of a single token will save the congestion that now occurs from making change." Passengers may use either coins or tokens, but he believed that the use of the latter would become general after their convenience had been established.

Recent Bus Developments

Coach Sale Disapproved

Commission Rejects Proposal of Indianapolis Street Railway to Purchase Bus Company

The Indiana Public Service Commission on May 13 disapproved the proposed purchase of the Peoples Motor Coach Company, Indianapolis, by the Indianapolis Street Railway for $500,000. The commission held that the price was unreasonable and that the financial condition of the railway is not sufficiently sound to make the purchase. The commission said:

> The oral testimony offered and the exhibits do not agree in all respects, but these disagreements need not be entered into for the purpose of this cause, because a reconciliation of such differences would not affect the determination of this cause. The commission believes that the cause depends more upon matters of principle and public policy than on figures.

The order sets out that the physical property valuations brought out in the hearing include $237,318, estimated by Earl Carter, engineer for the commission; $250,000 estimated by A. Smith Bowman, president of the coach company as intangible assets, and $234,000 for the present value of the 40 buses of the company, and $233,622, physical value fixed by Harry Alexander, acting for Mack Trucks. In this connection the commission said:

> The above appraisals are typical of the evidence introduced. The difference between the present value of the tangible assets and the $500,000 to be paid for the common stock, plus the obligations of not less than $92,000 to be assumed by the petitioner, represents the value of the business or going concern value and working capital. That sum would be $241,000 on the basis of $500,000 purchase price and $333,000, the highest estimate of tangible assets on the basis of $592,000 purchase price including liabilities assumed. Even the lesser of these sums is not within reason as indicating going concern value and working capital.
>
> If the proposed purchase price were reasonable—if it were a prudent investment—the reasonable ability of the purchaser to pay the consideration proposed should be considered before authorizing the purchase.

It also is pointed out that the legal rate of interest in Indiana is 6 per cent and that testimony showed the best bid obtainable on the notes was 8 per cent. The order says that these facts lead the commission to believe that this investment would be hazardous and that since the motor coach company "is now serving the public with fair success, both in service to the public and in yielding financial return to the operator, a transfer of the operation should be based upon ample assurance that it would be run successfully. Such conviction has not been warranted by the evidence in this cause."

The order also says that under the two, there is no provision to give the public any direct financial advantage of the saving, but to transfer the savings to the railway. The commission says further:

> The commission believes that surplus earnings by one public utility should inure to the benefit of the public rather than to be applied to eliminate a deficit suffered by another public utility. Public convenience and necessity is the basis and the reason for the existence of these public utilities. After a fair return from its operations, the additional benefits should flow to the public, whose streets it uses, whose convenience it must serve and whose necessities it must meet. The commission cannot agree to the proposed transfer of the Peoples Motor Coach Company property or to the total denial of the public to participate in savings in the operation of said property in the event of such transfer and in the event of such savings being as estimated or less than estimated.

The order says Mr. Bowman's testimony showed the original investment of his company in 1923 was only $45,000 and that the remainder of the property has been paid for out of the earnings of the company since that time. As the commission sees it, "the public, by its patronage, paid for much the greater part of this property."

John McCardle was the only commissioner who voted against the order.

De Luxe Coach Line from Los Angeles to Sea

Entry by the Pacific Electric Railway, Los Angeles, Cal., into de luxe motor coach service is to begin on a new line to be operated between Pershing Square, Los Angeles, and Castellammare via the highly scenic Beverly Boulevard.

Four parlor coaches will be operated hourly over this route. Each will have a seating capacity of 29 passengers. No more than that number of passengers will be carried. The plans are to make this service of the very highest type, both as to running schedule and equipment used. The date service is to start will not be announced until the buses are received.

In this connection it is interesting to note that a check made recently shows that the company is operating 165 motor coaches. Of these 122 are used in places outside of Los Angeles proper and 43 in local service within the city, this latter figure representing half of the coaches of the Los Angeles Motor Bus Company, owned jointly by the Los Angeles Railway and the Pacific Electric Railway. The combined investment of the company in garages, motor coaches and equipment incidental to their operation exceeds $1,500,000.

Buses Between Indianapolis and Louisville

Through bus service between Indianapolis, Ind., and Louisville, Ky., has been resumed by the Interstate Public Service Company. For the present only two buses are operated each day, but following the completion of the highway work from Indianapolis to Louisville more buses will be added. Bus tickets are good on all of the Interstate interurbans the same as regular interurban tickets, except on extra fare trains.

Three Bus Lines May Replace Railway Service in Lincoln

The Lincoln Traction Company, Lincoln, Neb., has applied to the State Railway Commission for authority to abandon three more railway lines and substitute buses. By an arrangement with the Omaha, Lincoln & Beatrice Railway, an interurban running from the business section to the suburbs of University Place and Bethany, it will withdraw bus service from Lincoln to the former town, and will also cut out a long loop through the residence district of University Place, where it comes into competition with the interurban. The local company says that this bus also competes with its own cars to that suburb, and that the district eliminated is adequately served by the interurban. The buses will stop at 38th and Holdrege Streets, a mile closer the city.

Discontinuance of rail service is also sought on its South Fourteenth line, a distance of 3 miles. This rail service is now supplemented with bus service.

Abandonment of rail service on its North Tenth Street line for a length of 2 miles is also asked. Buses will be substituted. The rails are now down on a street that is to be resurfaced, but the company says it has not the $12,000 required as its share of the improvement. Abandonment also of rail service to Lakeview and Capital Beach, the latter a summer resort, 2 miles west of the city, and substitution of buses is asked.

It is the claim of the company that none of the lines named is paying operating expenses; that it is constantly suffering losses and deficits from its general railway operations in the city, and is not earning a sum sufficient to pay taxes, operating expenses and fixed charges. It shows that it is endeavoring, under great financial handicaps, to continue to render transportation service to the city and that each one of the requests made is in behalf of that program.

Buses on Worcester Suburban Run

Announcement was made on May 17 by officials of the Worcester Consolidated Street Railway, Worcester, Mass., that the electric railway lines in the Blackstone Valley serving towns from Worcester to Uxbridge will be discontinued on May 21 and buses substituted on Sunday, May 22.

Wanted—A Jitney License Ordinance in Louisville

Jitneys are operating on the streets of Louisville, Ky., without paying bus licenses. The bus license ordinance expired on May 1 and no new ordinance has been passed by the General Council to take its place. Passage of a new bus license ordinance was held up by the sinking fund commissioners pending a decision by the Court of Appeals on the injunction suit of the Louisville Railway to enjoin the operation of buses on the streets of Louisville.

Plans of the sinking fund commission is to boost the license of jitneys, based on the number of passengers carried by the machine. The old fee was $25 a year flat. There are approximately 300 jitneys operating on the streets there this year, and based on an average $50 rate, the sinking fund would collect approximately $15,000 in license. This is double the amount now received. Another feature proposed for the new ordinance is to place the jitneys under control of the Board of Public Works.

New York Bus Contracts Blocked Again

Lacking the votes within the Board of Estimate to award a bus franchise to the Equitable Coach Company or to any other of the bidding companies, Mayor Walker of New York City refused to let the matter go to a vote at the May 19 meeting of the board and laid it over for one week.

In the opinion of most observers at City Hall the action means that the board is so hopelessly deadlocked on the bus question that it will be impossible to reach an agreement before the Board of Estimate adjourns for the summer on June 16.

Minneapolis Company Protected from Encroachment

Lake Minnetonka territory has been protected for the Twin City Rapid Transit Company, Minneapolis, Minn., and its bus subsidiary by a decision of the Minnesota Railroad and Warehouse Commission denying the petition by the Northland Transportation Company to pick up passengers at the intermediate stations of Hopkins and St. Louis Park, served by both railway and bus lines of the Rapid Transit Company, for transportation into the Twin Cities over its long-distance routes.

The Northland makes pick-up passengers at Excelsior on Lake Minnetonka, long served by an electric railway for transportation over state highway No. 12, which is outside the center of that town, at 50 cents a head, or 15 cents more than the railway fare to Minneapolis. The commission directed that if greater transportation service to Hopkins and St. Louis Park is required the proper procedure is appeal to the commission.

The commission said that the idea of competition in rendering local transportation in metropolitan areas has long since been discarded in the United States.

Enjoins Buses on Interstate Lines.—Judge Henry T. Lummus, in Superior Court, recently enjoined the Interstate Motor Coach lines from operating any motor vehicles for carrying passengers between Worcester and Whitinsville and intermediate towns of Millbury, Sutton, Grafton and Northbridge, acting on the bill of equity brought by the Worcester Consolidated Street Railway against the Interstate Motor Coach Lines. The bus line is enjoined from operation until it has secured a license from the City Council of Worcester and the selectmen of these several towns. In the bill the Worcester Consolidated declared it has equipment in and for the conduct of passengers in these towns estimated at $2,000,000 and pays taxes on the same to the city of Worcester and these towns.

Bus Service Extended. — The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission for certificates of public convenience and necessity authorizing it to extend its bus service from Fifty-sixth Street in the City of San Diego, along El Cajon Avenue to La Mesa, outside the city of San Diego; and also from the junction of Imperial Avenue and 34th Street in the city of San Diego to the La Mesa district.

Bus Line Sold.—Sale of the Le Roy-Caledonia-Scottsville line of the Rochester Interurban Bus Company, a subsidiary of the New York State Railways, to the Western New York Motor Lines, Inc., has been announced. The Western New York company, with headquarters at Batavia, N. Y., operates the de luxe Blue Bus service between Buffalo and Rochester and several smaller lines in the territory.

Company Wants Exclusive Bus Rights.—The City Council of Seattle, Wash., has been formally notified by the Seattle & Rainier Valley Railway that all negotiations for a transfer fare reduction on the valley line are to be ended unless the company is given exclusive right to operate buses along Empire Way. It had been virtually agreed that the company would reduce from 10 cents to 8⅓ cents fares that include transfer to the municipal lines. In return it was insisted that the company be given a monopoly of transportation in the valley. Walter M. Brown, general manager, informed the Council that Marshall E. Sampsell of Chicago, president, in a telegram has reiterated the demand for exclusive transportation rights. The city is operating a bus line on Empire Way and residents of the district have protested its removal.

Buses in High Point.—A bus system supplanted railway cars in High Point, N. C., during the latter part of April by the Southern Public Utilities Company. Five buses were put on as a trial. When the North Carolina Public Service Company discontinued railway service it conceded its carrying rights to Chester Hawkins of the Southern Public Utilities Company rather than increase the carrying facilities. In the event that the bus system should fail, however, the Public Service Company will re-establish railway service according to a contract with the city officials.

Would Operate Over Chesapeake Bridge.—The United Railways & Electric Company, Baltimore, Md., has applied in the name of the Baltimore Coach Company, under which its bus lines are operated, to be permitted to operate a line of buses between Baltimore and Ocean City, Md., when the Chesapeake Bay is bridged. A bill permitting the bridging of the bay was passed at the last session of the Maryland General Assembly. In filing the application now with the Maryland Public Service Commission, it is pointed out, the United will be in a preferential position when the bridge is constructed.

Financial and Corporate

Inland Empire Purchase Approved

Interstate Commerce Commission Sanctions Deal by Which Great Northern Acquires Interurban System

Interurban lines and all other property of the Spokane & Eastern Railway & Power Company and the Inland Empire Railroad were taken over by the Great Northern Railway on May 10, following receipt of an order from the Interstate Commerce Commission permitting the purchase. The Great Northern has organized a new subsidiary, the Spokane, Cœur d'Alene & Palouse Railways, which will acquire the interests of the two former operating lines in the territory out of Spokane, Wash., headquarters.

The properties have been operated since Dec. 1 by the Great Northern staff under a purchaser's agreement. With the permanent change, F. S. Elliott, general superintendent of the G.N., acquires the new electric properties as a part of his division. Other officials of the new company will be J. M. Doyle, superintendent; B. Lantry, assistant superintendent, and J. W. Hungate, electrical superintendent. A portion of the staff of the old Inland organization was taken into the G.N. offices at Spokane. W. J. Johnston, assistant general manager of the Inland, and operating head, will retain his present offices in the interests of the Harris Savings & Trust Company, Chicago, representing certain bondholders.

The terminal building, depot and headquarters of the Inland system for more than twenty years have been abandoned for this purpose. The electric lines now operate out of the main Great Northern depot. This means the abandonment, also, of the former main electric line through Main Avenue, one of Spokane's busiest streets.

The Interstate Commerce Commission approved the sale of the electric railways on the basis of their being unable to operate profitably under existing conditions and because of promise that the Great Northern may make the lines pay as a part of a large general system.

The properties involved include 40.35 miles of road from Spokane to Hayden Lake, Idaho; 10.39 miles from Spokane to Flora, and other shorter sections, all of the Spokane & Eastern system, and 88.9 miles of line from Spokane to Moscow, Idaho, and 36.8 miles from Spring Valley to Colfax of the Inland Empire system.

Authority is granted to the new Spokane, Cœur d'Alene & Palouse Railways to issue $860,000 of demand notes and to assume obligation and liability in respect of $442,000 of first mortgage bonds, with the Great Northern assuming liability for the bonds. This came from an agreement of the two original lines to sell all property for about $1,250,000. The Spokane, Cœur d'Alene & Palouse will borrow $860,000 from the Great Northern, giving notes at 5 per cent.

The purchase of the electric "feeder" lines by the Great Northern is in keeping with the general program of electrification of the company in the Pacific Northwest.

Refinancing for Baltimore Company

As the result of a conference held on May 10 a plan is under consideration which involves a change in the capital structure of the United Railways & Electric Company, Baltimore, Md., through the purchase or exchange of one form of security for another. News of this activity was released recently by Alexander Brown & Sons, fiscal agents of the company. They could not now state definitely that such a plan would be approved and if it were what the terms would be and its effect on present securities. However, the plan so far discussed contemplated an offer of 60 per cent of par in cash for income bonds, provided substantially all present holders desired to accept such an offer.

Recent sharp advances in the incomes and other securities were noted, but Alexander Brown & Sons had not participated in this buying and thought it proper that security holders should have this information before them for their guidance.

W. M. Frazee Receiver of the Indianapolis & Cincinnati

Will M. Frazee, Rushville, Ind., has been appointed to succeed the late Charles L. Henry as receiver for the Indianapolis & Cincinnati Traction Company, which is involved in a litigation to foreclose a $2,000,000 mortgage. Mr. Frazee was one of the organizers of the railway and was purchasing agent and claim adjuster until a few years ago, when he disposed of his interests in the line.

Balance in Detroit Increases

For the year ended April 30, 1927, the total operating revenues of the Department of Street Railways at Detroit, Mich., were $24,503,355, against $24,230,554 for a similar period last year. These figures included railway operating revenue for the two years of $21,768,982, against $23,035,168, and a coach operating revenue of $2,734,372 and $1,195,385 for the year ended April 30, 1926. Total operating expenses were $18,918,615, against $18,491,413 for the year ended April 30, 1926. Included in these figures are $16,423,622 and $17,303,345 railway operating expense in 1927 and 1926 respectively and coach operating expense of $2,494,993 and $1,188,068 for the year ended April 30, 1926. Net revenue from all sources was $5,858,718, against $5,952,105. The net income for the 1927 period was $3,190,036, against $3,280,286. The balance for the period was $589,809, against $572,265 in the 1926 period. Total railway passengers numbered 466,644,059, against 495,966,850 in the 1926 period. Total coach passengers were 34,323,201, against 15,903,956 for the year ended April 30, 1926.

$1,795,000 Chicago Rapid Transit Bonds Offered

The National City Company and Halsey Stuart & Company, Inc., New York, on May 17 offered an additional issue of $1,795,000 Chicago Rapid Transit Company first and refunding mortgage 6 per cent bonds, due in 1953, at 93 to yield 6.56 per cent. Net earnings of the company in 1926 applicable interest and reserves amounted to $3,899,565, as against $2,452,850 interest on divisional mortgage bonds, equipment obligations and first and refunding mortgage bonds, including the present issue. The company operates the elevated lines in Chicago.

Springfield Earnings Show Gain

Transportation earnings of the Illinois Power Company, Springfield, Ill., for the year ended Dec. 31, 1926, were $720,727, compared with $708,984 for the year previous. These figures were contained in the income statement of the company submitted to the board of directors covering operations for 1926 compared with the preceding year. The company carried 107,909 fewer revenue passengers than in 1925. Comparative figures showing revenue passengers carried during the past five years are as follows:

1922	11,431,799
1923	11,150,971
1924	10,661,451
1925	11,286,894
1926	11,178,985

Effective on May 15 the schedule of fares on the railway and bus system was revised to eliminate the four tickets for 25 cents rate and the monthly family tickets. In lieu thereof, the report states, rates of two tickets for 15 cents and eight tickets for 50 cents were established, which, plus a 10-cent cash fare, are the rates now in force.

During the year the company purchased two 29-passenger buses to supplement railway service in Springfield, making a total of ten owned by the company.

No public financing was done in 1926 other than the sale of 7 per cent preferred stock on the customer-ownership plan. At the end of 1926 2,801 persons owned stock or were subscribing for it, an increase of 289 over that of the previous year.

Grand Rapids Railroad Accepts Obligations

The City Commission of Grand Rapids, Mich., has passed a city ordinance permitting the Grand Rapids Railway to sell its franchise and privileges to the Grand Rapids Railroad. The new company will accept all the obligations and liabilities of the Grand

Rapids Railway. Prior to the passage of the ordinance, Gerald J. Wagner, the city's consulting engineer, informed the commission that approximately $920,000 of stock of the old company had been deposited in anticipation of the readjustment.

Net Earnings Increase

United Railways, Baltimore, Reports Increase in Revenue Passengers Carried—Improvement Work Continues

After paying all operating expenses and fixed charges, including interest on income bonds, the balance on the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1926, was $1,845,839. From this was deducted $818,448 for dividends and $835,785 for depreciation, the balance going to surplus. The facts were included in the annual report to the stockholders. The net earnings of the company over the past five years available for interest payments, after caring for all operating expenses taxes and rentals, but before depreciation have been as follows:

Year	
1922	$4,495,927
1923	4,615,585
1924	4,579,550
1925	4,605,089
1926	4,669,854

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES OF THE UNITED RAILWAYS & ELECTRIC COMPANY

Operating Income	1926	1925
Revenue from transportation	$16,571,545	$16,481,077
Revenue from other railway operations	144,163	140,142
Total operating income	$16,715,709	$16,621,220
Operating Expenses:		
Maintenance of way and structures	$852,531	$966,995
Maintenance of equipment	917,730	869,908
Maintenance of power	38,968	46,045
Total maintenance	$1,809,230	$1,882,959
Depreciation	835,785	831,061
	$2,645,016	$2,714,020
Power service	1,412,358	1,351,755
Conducting transportation	5,215,053	5,270,167
Traffic	4,164	*4,145
General and miscellaneous	1,528,782	1,464,987
Transportation for investment—Credit	*14,570	*19,973
Total operating expenses	$10,790,804	$10,776,811
Taxes and licenses	1,672,316	1,632,386
Total operating expenses and taxes	$12,463,121	$12,409,197
Net operating income	$4,252,587	$4,212,022
Non-operating income	139,568	120,814
Gross income	$4,392,156	$4,332,837
Interest on funded debt	2,093,415	2,093,415
Remainder	$2,298,741	$2,239,422
Other Deductions from Gross Income:		
Rents	$558,087	$558,809
Interest on unfunded debt	64,544	33,560
Interest on income bonds	559,080	559,080
Amortization of discount on funded debt	58,994	59,388
Miscellaneous	47,980	47,974
Total	$1,288,687	$1,258,813
Net income (transferred to profit and loss)	$1,010,054	$980,609
Seat-miles	1,637,173,845	1,627,061,900
Car-miles	35,304,583	35,717,666
Revenue passengers	225,255,633	224,235,527
Transfer passengers	93,695,891	92,893,828
Revenue passengers per car-mile	6.3878	6.2852
Maintenance cost per car-mile	0.0512	0.0527
Depreciation per car-mile	0.0237	0.0233
Ratio to Total Operating Income:		
Maintenance and depreciation, per cent	15.82	16.33
Operating expenses and depreciation, per cent	64.55	64.84
Taxes, per cent	10.00	9.82
Operating expenses, depreciation and taxes, per cent	74.55	74.66

* Credit.

Since 1906 the company has set up depreciation reserves aggregating $15,150,000, out of which more than $13,630,000 has been put back into the property for reconstruction and improvements and for property retired, leaving a balance of $1,520,541 in the reserve account. During the past five years the company spent $13,594,216 for maintenance and depreciation.

In 1926 the company reconstructed 15.2 miles of track. During the past eight years 131.8 miles of track was reconstructed, or nearly one-half of all the tracks in city streets are under frequent service. Twelve additional articulated cars were constructed in the company's shops. The total number of this type that has been constructed and is now in service is 34. There have also been constructed and placed in operation eleven cars of the permanently coupled type.

The agreement with the employees covering wages and working conditions terminated on Dec. 31, 1926. As a result of a conference with representatives of the employees' association, a two-year agreement was reached effective Jan. 1, 1927, providing for an increase in wages of all employees of 1 cent per hour for 1927 and a like additional increase for the year 1928.

During the year the company, in conjunction with the United Railways Association of Baltimore, an organization of employees, expended for free medical and nursing attendance $86,950 and for pension and insurance payments $111,464. Effective March 23, 1926, the company placed $5,000,000 in life and permanent disability insurance for its 5,000 employees.

On the subject of bus service the report states that the company now owns or controls practically all the buses operating within Baltimore city and suburban territory. In addition, the company owns what is known as the "Gray Line," sightseeing tours.

Reference was made to a survey made in Baltimore in the fall of 1926. In that report it was disclosed that of the more than 765,000 persons who daily entered and left the business section other than by walking more than 67 per cent used the street cars, 2.3 per cent used buses, 1.5 per cent used taxis and 29.2 per cent used private automobiles. Street cars carrying two-thirds of the traffic represented 12 per cent of vehicles used, against 88 per cent of automobiles.

In a belief that an explanation of what became of the fare would interest stockholders and the public C. D. Emmons, president, shows in the report the diminishing returns of the 7½-cent adult ticket fare. The average fare received by the company is 7.31 cents because of the lower rate of fare to children and commuters. He explains thus:

Of this 7.31 cents—

Approximately $5\frac{4}{10}$ cents or...5 42/100 cents was paid to employees for wages; to manufacturers for necessary supplies and material; to the tax collector and for depreciation.

5.4c

Approximately $1\frac{5}{10}$ cents or ...1 46/100 cents was paid for property rented and for money borrowed. (This represents the company's bonded debt held by approximately 115 Savings and other Banks in Maryland; and approximately 12,000 individual investors.)

1½c

Approximately ⅓ cent or...35/100 cent was paid to 2,242 stockholders.

The balance was credited to surplus.

Quarterly Surplus in Philadelphia $15,503

The quarterly income account of the Philadelphia Rapid Transit Company, Philadelphia, Pa., and some passenger statistics are shown in the accompanying table.

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR THE QUARTER ENDED MARCH 31, 1927

Operating revenue	$14,489,838
Operation and taxes	10,986,995
Operating income	$3,502,842
Non-operating income	209,845
	$3,712,687
Payments to City: Sinking fund and Frankford Elevated	240,049
	$3,472,638
Fixed charges, dividends and management fee	3,457,134
Surplus	$15,503

PASSENGER STATISTICS OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR THE QUARTER ENDED MARCH 31, 1927

	Passenger Revenue	Passengers Carried	Average Rate in Cents per Passenger
Surface, subway and elevated	$12,055,626	229,020,898	5.26
Motor bus	690,623	7,552,880	9.14
	12,746,250	236,573,778	5.39
Taxi	1,545,682		
Total	$14,291,932		

Indianapolis February Statement Reports on Depreciation Fund

Gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., for the month of February this year totaled $451,207, a decrease of $9,472 compared with the corresponding month last year, it was shown in a report just filed with the Indiana Public Service Commission. Operating expenses decreased $11,378, having totaled $334,561 this February. Net earnings for that month this year from operation were $116,646, compared with $114,740 for February of last year.

An interesting sidelight in the document is contained in the special report on the depreciation reserve fund, which to date shows a deficit of $336,809. When the present fares were put into effect several years ago by the company it was understood that all surplus should be held in a depreciation reserve account, available for use only in the rehabilitation and repair of equipment. The members of the Indiana Public Service Commission had estimated that the higher fares would account for an increase of approximately $500,000 in the company's revenues, but the reverse proved true. The depreciation reserve account since the first has stood in the red, mounting higher and higher each month.

New Director in Savannah.—George H. Baldwin, Jacksonville, was recently elected a member of the board of directors of the Savannah Electric & Power Company, Savannah, Ga., to succeed his father, the late George J. Baldwin.

Capital Increased. — The Kentucky Power Company, Augusta, Ky., which recently purchased the electric utilities at Maysville, Ky., from the Cochrane interests, has filed amended articles for the Maysville Street Railroad & Transfer Company, increasing the capital from $107,000 to $157,000.

Galveston-Houston Issue Offered.—Lee, Higginson & Company, Estabrook & Company, Parkinson & Burr and Stone & Webster and Blodget, Inc., are offering an additional issue of $1,200,000 Galveston-Houston Electric Company secured gold notes, series B, 6 per cent, June 1, 1931, at 97.41.

Final Hearing on Valuation of Easements.—The Maryland Public Service Commission has set May 26 as the date to hear the final arguments on the valuation of easements of the United Railways & Electric Company, Baltimore. In the valuation case held some time ago the commission placed a total value of $77,000,000 on the company's property, $7,000,000 being for easements. It was contended by the people's counsel that these easements should not be included and the case reached the courts. The Court of Appeals held that the method used by the commission in valuing the easements was wrong but the placing of a valuation was upheld.

Reports Operating Loss for 1926.—The Hammond, Whiting & East Chicago Railway, Hammond, Ind., operated at a loss of $11,619 during 1926, according to a report filed with the Indiana Public Service Commission on April 30. Total revenue for the year was $22,520, according to the statement. The road carried 328,290 passengers, who paid an average fare of 7.73 cents. Approximately 33 miles of track is contained in the system, which connects with the Chicago City Railway.

San Jose Gross Is $13,754.—The San Jose Railroads, operating in San Jose, reports to the California Railroad Commission its 1926 operating revenue at $385,545 compared with $389,550 for 1925. The operating expenses, excluding taxes, are $348,034 for 1926 and $343,033 for 1925, leaving net operating revenue of $37,511 for 1926 and $46,517 for 1925. During 1926 taxes charged to operation amounted to $25,265 and for 1925 to $25,426. Deducting the taxes leaves operating income of $12,245 for 1926 and $21,091 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents a gross corporate income remains (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $13,754 for 1926 and $22,921 for 1925.

Threatening Situation in Johnson City.—The Johnson City Traction Corporation, Johnson City, Tenn., is suffering from enormous inroads on its revenue and traffic by buses and private passenger cars. So serious has the situation become that it is stated that unless traffic improves it will become necessary to discontinue the operation of the system. At the present time the company is operating only five cars. Its traffic is only about half what it was several years ago.

Surplus for Nine Months Lower.—For the nine months ending March 31, 1927, the total revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., was $46,793,095 an increase of $812,288 over the corresponding period of last year. Expenditures for operating and maintaining the property increased $1,545,509. Taxes payable to the city, state and the United States increased $169,547. Rentals and other income deductions decreased $46,016. The net result for the nine months was a surplus of $507,687, against a surplus of $1,364,439 for the corresponding period of last year. The comparison is influenced by the strike during the month of July, 1926, as well as the fact that in July of 1925 there was a lump sum payment of $770,000 on account of the new advertising contract, against which there was no similar payment this year.

Bank Files Claim Against Chicago Railways. — The Illinois Merchants Trust Company, Chicago, as trustee for $33,866,631 series A, B and C twenty-year bonds of the Chicago Railways, filed a priority lien on May 6 against the railway in the United States District Court. The action was taken to protect the claim of these bonds to a place second only to the first mortgage bonds, of which the Harris Trust & Savings Bank, Chicago, is trustee, in the distribution of the assets of the company in case of foreclosure. The railway passed into the hands of receivers on Feb. 1, when its twenty-year franchise expired.

$54,811 Gross Income in 1926.—The San Francisco, Napa & Calistoga Railway, operating from Vallejo to Calistoga, reports to the Railroad Commission its 1926 operating revenue at $231,199 compared with $246,913 for 1925. The operating expenses, excluding taxes for 1926, are reported at $164,816 and at $157,322 for 1925, leaving net operating revenue of $66,383 for 1926 and $89,591 for 1925. During 1926 taxes charged to operation amounted to $14,708 and for 1925 to $16,928. Deducting the taxes leaves operating income of $51,675 for 1926 and $72,662 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $54,811 for 1926 and $76,383 for 1925.

Net Operating Income $40,000 a Month.—Substantial decreases in operating expenses have enabled the Omaha & Council Bluffs Street Railway, Omaha, Neb., to keep the red out of its net income. Revenues are now running about $240,000 a month, or about 3 per cent less than a year ago, but a reduction of expenses has enabled the company to show a net operating income of $40,000 a month. This leaves about $2,000 a month above interest and taxes. These figures do not include the bridge revenues nor that part of the system which is operated in Iowa. The first seven days in May showed revenues of $56,471, against $58,325 for the corresponding period in 1926.

Will Abandon Schomberg Line.—The Toronto Transportation Commission, Toronto, Ont., plans to abandon the Schomberg radial line. It runs a distance of 14.4 miles through somewhat poor country. Schomberg is about 15 miles from Toronto. The commission says it has been losing money yearly on the Schomberg proposition. A recent editorial in the Toronto *Star* suggested that Schomberg should not lose its freight connection with the Canadian National Railway. The government-owned road should acquire it and use it for freight purposes only, under which it might pay.

Would Discontinue Freight Service.—The Schenectady Railway applied to the Public Service Commission on May 9 for permission to discontinue on June 1 freight service on all of its lines between Schenectady and Ballston Spa, between Schenectady and Albany and between Schenectady and Troy. It states that for a number of years it has been operating this electric freight business at a loss.

Gross Corporate Income $34,252.—The Central California Traction Company, operating from Sacramento to Stockton, reports to the California Railroad Commission its 1926 operating revenue at $490,526 compared with $592,036 for 1925. The operating expenses, excluding taxes for 1926, are reported at $440,444 and at $483,069. for 1925, leaving net operating revenue of $50,082 for 1926 and $108,966 for 1925. During 1926 taxes charged to operation amounted to $30,049 and for 1925 to $31,195. Deducting the taxes leaves operating income of $20,033 for 1926 and $77,771 for 1925. Adding to the operating income the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $34,252 for 1926 and $94,727 for 1925.

Twelve-Mile Line Abandoned.—The Public Service Commission of Oregon on May 10 authorized the Portland Electric Power Company to suspend operation of its suburban line from Montavilla to Troutdale, a distance of about 12 miles. This route has been losing money for some time as the residents of these towns use either private cars or the bus line for transportation.

Personal Items

New Directors and Vice-President for Georgia Power Company

Four new directors from as many cities in Georgia have been elected by the Georgia Power Company, Atlanta, Ga. They are: Billups Phinizy, president of the Southern Mutual Life Insurance Company, in Athens; John M. Graham, president of the National City Bank, Rome; George E. Patterson, executive vice-president of the Fourth National Bank of Macon, and J. Leonard Rountree, president of the People's Bank of Summit, Georgia, and a former state legislator from Emanuel County.

At the same meeting William E. Mitchell, Birmingham, was elected vice-president and general manager of the company, to succeed W. H. Taylor, who resigned several months ago to become vice-president of the United Gas Improvement Company. Mr. Mitchell, for many years a leading figure in the water power development of the South, is one of the best known men in electrical circles in the country.

Personnel Changes on Market Street Property

Effective May 10, M. McCants was appointed vice-president in charge of transportation and J. M. Yount vice-president in charge of equipment and maintenance of the Market Street Railway, San Francisco, Cal. In announcing the changes the management expressed the desire to place Mr. McCants in a position where he could devote his entire time to transportation. In appointing Mr. Yount to the vice-presidency in charge of equipment and maintenance the management has delegated to him the supervision of all work connected with shops, tracks, overhead lines, cables and substations. Messrs. Legare, Bivins, Foster, Peterson and Delaney will report to Mr. Yount. J. W. Delaney, effective May 11, was appointed superintendent of equipment.

In accord with the Byllesby policy of making promotions and advancements from its own personnel, five other Market Street Railway men have been appointed, as follows:

F. W. Allen, commercial manager. He was formerly superintendent of Geneva division, a position he has held since Nov. 1, 1902. Mr. Allen entered the service of the company on June 23, 1894, as a motorman at Geneva division. Later he became clerk and car dispatcher, ultimately receiving the title of division superintendent.

The post vacated by Mr. Allen will be filled by E. H. Lincoln, who has been assistant superintendent of McAllister division since Sept. 1, 1924. Mr. Lincoln entered the service of the company as a conductor at 28th Street division. Later he became a clerk. On Sept. 15, 1923, he joined the bureau of employment and training as instructor of conductors.

P. O'Marie, superintendent of ferry terminals since 1921, becomes superintendent of Sutro and McAllister divisions. Mr. O'Marie was employed as a motorman in May, 1901, at Turk and Fillmore division on the old Park and Ocean line. He remained with the line when it was transferred to Oak and Broderick division in 1903. In the same capacity he went to Sutro division in 1908, where he remained until 1915, when he was made inspector at Turk and Fillmore. His appointment as division superintendent of Sutro will enable Superintendent John P. Jones to devote more time to his rapidly growing Turk and Fillmore and Washington and Mason divisions.

Byron Gunn leaves his place as starter at Third and Townsend Streets depot, where he has been since 1916, to become superintendent of ferry terminals. He joined the company as a conductor in 1909.

H. L. Sanders Heads Cincinnati Car Company

Henry L. Sanders, former vice-president of the Cincinnati Car Company, was elected president of the company on May 17; A. L. Kasemeier was re-elected vice-president in charge of sales; J. Howard Elliott was elected vice-president in charge of production and purchases; E. C. Bernhold was elected treasurer and will continue as secretary. Thomas Elliott will continue to serve the company as consulting engineer. Among other officials are Charles J. Ellis, who will be chief engineer and assistant to the vice-president in charge of production, and Dave M. Ritchie, who will be sales engineer and assistant to the vice-president in charge of sales. S. E. Reith will remain as assistant secretary and assistant treasurer.

J. P. Alexander Westinghouse New England Manager

J. P. Alexander has been made Boston manager of the Westinghouse Electric & Manufacturing Company in charge of all sales and service in New England. During the twenty years that he has been associated with Westinghouse Mr. Alexander has become a prominent figure in the electrical industry in New England and has gained a wide experience which makes him particularly fitted for the responsibilities of his new position.

Mr. Alexander was born in Chambersburg, Pa., and attended Chambersburg Academy, which at that time was conducted by his father. He graduated from Lafayette in 1907 with the degree of electrical engineer and enrolled on the Westinghouse company's apprentice course at East Pittsburgh in July of that year.

Upon completion of the apprentice course he entered the railway department at East Pittsburgh and remained there until 1911, when he went to the Boston office as railway engineer. In 1913 he became a railway salesman, located in the Springfield, Mass., office, and two years later went to the New Haven, Conn., office as railway and central station salesman.

He was made manager of the transportation division at Boston in September, 1922, and manager of the New Haven, Conn., branch office in 1924.

Archie G. Andrews, for twenty-three years with the Rockford & Interurban and the Rockford City Traction Companies, Rockford, Ill., has been appointed superintendent of operation of the Royal Rapid Transit Company, Madison, Wis., in active charge of 400 miles of bus routes. During his association with the Rockford traction interests he advanced from conductor to trainmaster, in which capacity he served for seven years. During the last two years he has been superintendent of transportation.

Obituary

George E. Maltby

George E. Maltby, vice-president and formerly general manager of the Jamestown Street Railway, the Jamestown Motor Bus Transportation Company and the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., died suddenly at Los Angeles, Cal., on April 29, where he had been spending the winter.

Mr. Maltby was a familiar figure in the electric transportation era and had been identified with the Broadhead interests in various executive capacities almost since its inception in the late '80s. Some time ago he relinquished active control of the lines on account of ill health, but retained the title of vice-president.

Clyde F. Kalp

Clyde F. Kalp, treasurer of the West Penn Railways, Pittsburgh, Pa.; the West Penn Power and a number of other public service companies, is dead. He started as a new-business solicitor for the West Penn Power Company at Connellsville, Pa., early in 1910. In 1915 he was transferred to the Pittsburgh office of the company and spent several years in the research department, and later was engaged in the construction of the Windsor power station. Some months after the declaration of war Mr. Kalp was graduated as a first lieutenant of infantry from the training school at Fort Oglethorpe, Ga. He later was attached to the 52d Infantry, Sixth Division, and also served as an instructor at several army camps in the South.

He returned to Pittsburgh in 1919 and entered the treasury department. Through diligent application to his duties he was made assistant treasurer, and upon the death of C. C. McBride was elected treasurer of the West Penn companies on May 20, 1925.

Besides being treasurer of the West Penn Railways, Mr. Kalp was an officer or director in many other companies, among them being the Allegheny Valley Street Railway, Monongahela West Penn Public Service Company and the Wheeling Traction Company.

Mr. Kalp was born at Mount Pleasant, Pa., on May 4, 1891. He was graduated from the local public schools.

R. S. Maddock, superintendent of equipment of the United Electric Railways, Providence, R. I., died on April 23. Since he became superintendent many improvements were placed in effect and he had a campaign planned many months in advance which in the words of *All Aboard*, the official publication of the company, would have made the repair shop second to none. Mr. Maddock entered the service of the United Electric Railways on March 18, 1923, as assistant superintendent of equipment. He was appointed superintendent of equipment on May 1, 1926, at which time W. D. Wright, then superintendent of equipment, retired. Mr. Maddock was 44 years old.

John Mooney, superintendent of the Flatbush division of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died recently. Mr. Mooney was 48 years old. He entered the service of the company many years ago as a trainman and was promoted successively through the various posts to the position at Flatbush, a post he had filled for a long time.

Frank S. Elgin, at one time co-receiver with T. H. Tutwiler of the Memphis Street Railway, Memphis, Tenn., died recently. His receivership embraced other utilities in Memphis before they emerged from financial troubles about the time of the World War. Mr. Elgin was a prominent lawyer and a former United States marshal for the western division of Tennessee.

Amos Caverly, driver of the first horse car in Minneapolis, Minn., died recently in that city, where he had lived since 1871. Mr. Caverly was 82 years old. He always maintained a great interest in the railways. He liked to tell of the first electric car installed for demonstration purposes and of his many experiences, which would seem somewhat out of the ordinary at the present time. Before he went to Minneapolis he operated a car on the lines of the local railway in Lowell, Mass. He was born in Newport, Me.

Viscount Cowdray, English financier, builder of tunnels, a developer of Mexican, Persian and Russian oil fields, died in Aberdeen, Scotland, on April 30. W. D. Pearson, who later became Lord Cowdray, headed the firm of S. Pearson & Company, public utility contractors, founded by his grandfather in 1889. The engineering feat which won him most renown in America was the construction of the Pennsylvania Tunnels at New York. At the age of 21 he took charge of his first contract. Under his management S. Pearson & Company became internationally prominent. He successfully completed the tunnel under the Thames at Blackwall, a pioneer accomplishment, and went on to contract for every kind of public works, varying from the railways and harbor docks to water works and drainage systems. Lord Cowdray was born in 1856. He was educated in a private school and was early trained in the business that had been founded by his grandfather.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

World Clinic on Economic Ills Goes Forward in Geneva

Leaders of Forty-seven Countries Discuss Methods of Recovery and Agree as to Diagnosis—Unemployment and the Interdependence of Nations Among the Outstanding Topics

BY EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company, Inc.
Staff Correspondent in Attendance

GENEVA, May 5—For two days representatives of 47 countries have been listening to a diagnosis of the world's economic difficulties. Twelve countries have been heard from. The encouraging feature is that the diagnoses agree—surely a good basis for the discussion next week, in committee, of the details of remedies.

What is the diagnosis on which the speakers, each speaking for his delegation, so far agree? There are, so they indicate, a number of diseases: First, that purchasing or consumptive power was curtailed by the war; second, that many trade barriers, and not merely high tariffs, have been erected, such barriers as fluctuating exchanges, high freight rates, troublesome customs formalities, quickly changed tariffs, which discourage long-time contracts, etc.

Of these diseases the restriction of purchasing power was most frequently stressed, but suggested remedies were not so readily forthcoming. Prof. Karl Gustav Cassel (Sweden), in a learned address, intimated that the restored purchasing power of backward countries might be a powerful stimulus if capital for their development were forthcoming in larger volume, and Karl F. von Siemens (Germany), again by intimation, pointed out the burdens to industry caused by the expansion of government functions and government intervention in industry. Dr. Zimmerman (Holland) also developed the same thought. Enlarged government functions withdraw men from productive enterprise and make them a tax on industry and thus on consumption. Government interference also burdens industry. The result is the reduction of purchasing power. Among government interventions Herr von Siemens cited high customs or tariffs not justified by natural differences, import prohibitions, export bounties and wage regulation. All these mislead industry into self-sufficiency, discourage technical progress and, in sum, depress the standard of life.

Answer All Questions
On the EXHIBIT SPACE BLANK
for the
A.E.R.A. Convention
Each Unanswered Question
Means a Delay
If You Hesitate Now You Will Repent Hereafter

As to trade barriers, the International Chamber of Commerce, represented in the discussion by Walter Runciman, has proposed the stabilization of tariffs, that is, that tariffs shall not change too often and without due notice.

UNEMPLOYMENT DISCUSSED

Naturally the question of unemployment has been very fully traversed, for it is recognized as one of the most serious results of Europe's economic dislocation. It is inevitably tied up with lack of purchasing power and the remedy for the latter is necessarily found in the remedy for the former. But in the handling of this subject there has been a solicitude that goes beyond its consideration as a cold economic fact. The human distress is keenly felt and expressed.

INTERDEPENDENCE OF NATIONS

One other point secured universal agreement—that nations are interdependent and that their dislocations react on each other. In fact the conference itself is the best evidence that the interdependence is a moving thought of all the countries of Europe.

Of tangible suggestions was Herr von Siemens' comment on the conditions necessary for international cartels, a subject sure to receive much discussion. He suggested that they were feasible only under three conditions: (1) that the industries in countries concerned must be accustomed to co-operate and come to an understanding; (2) that constituent national groups can only be formed where the number of those concerned is not too large, and (3) that the agreements must cover a commodity which is clearly definable and also comparable.

Dr. Zimmerman stressed the growing importance for present industrial countries of their potential home market, since backward countries tend to establish their own industries and thus cut down their imports of manufactured goods. This means an effort to increase home consumption and therefore to raise the standard of living.

Mr. Jouhoux (France) proposed the organization of two economic bodies, one to meet at least every three years to lay out the policies for the second body, which would be a standing economic council to carry on through committees studies of important economic questions.

Finally, to an American, there was a special appeal in two points of Herr von Siemens' address: his appeal, first, for the preservation of individualism and, second, for openmindedness and flexibility in one's economic and industrial attitude.

POSSIBLE RESULTS

What will be the result of this world conference?

The question is asked and answered dozens of times each day between sessions and in hotel corridors. The answer is always the same: Do not expect too much. The problems are extremely complex. The solution must be worked out slowly. But the groundwork can be laid here. The superstructure will come at a later similar gathering. Walter Runciman (England) put the broad fundamental well in these words: "Those who are concerned to maintain business prosperity in all countries are convinced that a mutual understanding in international economic and business problems is the surest guarantee for a growing volume of trade and for the maintenance of the higher standards of life and comfort which are the legitimate aspirations of modern democracy."

Interstate Public Service Orders Six Interurban Cars

Following are specifications for the six one-man, two-man interurban cars ordered April 8 by the Interstate Public Service Company, Scottsburg, Ind., from the G. C. Kuhlman Car Company, Cleveland, upon which delivery has been promised in 90 days:

Number of units	6
Type of unit	One-man, two-man, motor, passenger, interurban, double-end, double-truck
Builder of car body	Kuhlman
Date of order	4-8-27
Date of delivery	90 days
Weights:	
Car body	19,624 lb.
Trucks	10,000 lb.
Equipment	7,876 lb.
Total	37,500 lb.
Bolster centers	22 ft.
Length over all	45 ft. 6 in.
Length over body posts	33 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. ¾ in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Doors	Four, end
Air brakes	Westinghouse, variable load
Armature bearings	Plain
Car signal system	Faraday high-voltage and Westinghouse type S-T
Compressors	DH 16
Conduit	Flexible
Control	HL
Couplers	Tomlinson, Form 110
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Pratt & Lambert enamel
Floor covering	Battleship linoleum
Gears and pinions	Nuttall helical
Glass	Plate and standard
Hand brakes	Brill, stop handle
Heaters	Consolidated, truss plank
Headlights	Imperial type WDF
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	3¾x6, plain
Journal boxes	Brill
Lamp fixtures	G.E. short-circuiting fixtures
Motors	Westinghouse 510 E, No. 4, inside hung
Paint	Orange
Roof material	Canvas
Safety car devices	National
Sanders	Nichols-Lintern
Sash fixtures	Curtain Supply Co.
Seats	Brill No. 201-A
Seat spacing	36 in.
Seating material	Genuine leather
Steps	Three, one folding
Step treads	Kass and Sahkar
Trolley	Retrievers, Knutson No. 5
Trolley base	Ohio Brass, Form 4
Trolley wheels	Moor Jones, 6 in.
Trucks	Brill 177-E, 1X
Ventilators	Brill, car type
Wheels	Rolled steel, 28 in.
Special devices	Minier window wipers, Drew motorman's mirrors

Copper Breaks Through 13 Cents—Business Quiet

NONE of the non-ferrous metal markets was active during the week ended May 18 and prices for each of the major metals were lower, according to *Engineering and Mining Journal*. On May 18 copper could be had at 12.875 cents in Connecticut, zinc at 6 cents in St. Louis and lead at 6.60 cents in New York. These are new low levels for both zinc and lead for several years. Platinum has weakened further, whereas antimony, quicksilver and tin have shown little net change.

On May 12 a fair business was done in copper at 13 cents delivered in the Connecticut Valley. Since then, however, buyers have shown practically no interest in the market. Small sales have been made at 13 cents in the East and 13¼ in the Middle West, and on May 18 first hands sold at 12.875 cents delivered in Connecticut. Although producers until this date had held consistently at 13 cents—some of them are still asking this figure—a fair tonnage of second-hand metal for May delivery has changed hands at prices ranging from 12.825 cents to 12.875 cents. Various interpretations are placed on the April statistics that appeared last Thursday, but it is clear that consumers are not greatly impressed. Foreign business has been quiet, with Copper Exporters, Inc., maintaining its price at 13.35 cents c.i.f.

Lead has sold in reasonable volume during the past week, though it has been distinctly a buyers' market. The American Smelting & Refining Company maintained its New York contract price at 6.75 cents until Monday, when, on hearing of price concessions by other sellers, it was reduced to 6.65 cents. The reduction was accepted as a matter of course by buyers and did not stimulate business to any great extent. With the St. Louis market down to 6¼ cents, there would seem little reason for any one paying more than 6.60 cents, New York basis, for the freight rate from St. Louis is only 35 cents per 100 lb. Most of the buying has been for May shipment, though producers would gladly sell in two or three months ahead at the same price. Battery manufacturers continue conspicuous by their absence from the market.

Buying of tin has been spotty, with no great excitement in the market. Spot supplies continue almost unob-

ELECTRIC RAILWAY MATERIAL PRICES—May 17, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.70
Lead, cents per lb.	6.625
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.37
Tin, Straits, cents per lb.	67.00
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.425
Somerset mine run, Boston	1.875
Pittsburgh mine run, Pittsburgh	2.10
Franklin, Ill., screenings, Chicago	‡.
Central, Ill., screenings, Chicago	‡....
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.95
Steel bars, cents per lb.	1.85
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb.	2.90
Sheet iron, galvanized (24 gage), cents per lb.	3.75
Galvanized barbed wire, cents per lb.	3.20
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12-17.50
Colored	7-14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.6
White lead in oil (100 lb. keg), cents per lb.	14.50
Turpentine (bbl. lots), per gal.	$0.625
Putty, 100 lb. tins, cents per lb.	5.25-5.50

Wire—New York

Copper wire, cents per lb.	15.00
Rubber-covered wire, No. 14, per 1,000 ft.	$5.15-20
Weatherproof wire base, cents per lb.	16.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$130
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.00
Light copper, cents per lb.	9.50
Heavy yellow brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4.00
Lead, cents per lb. (heavy)	5.375
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	14.50
Rails (short), Chicago, gross ton	16.25
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.50

tainable, so the prices are largely nominal. August tin can be obtained at concessions of 3 to 4 cents from the prices asked for spot. Quotations for 99 per cent tin cover delivery in a week or two. Spot 99 per cent is unobtainable in any quantity.

In spite of a great deal of talk, zinc miners in Joplin continue to produce about 13,500 tons of concentrate per week, against sales of about half that quantity in each of the last two weeks. The price has been cut to $38 and it is possible that material curtailment will be brought about soon. Price of slab zinc has declined from day to day during the week, with the bulk of the business on May 17 and 18 being done at 6 cents. High grade is nominally at 8 cents in the Eastern district.

$350,000 Improvement Program for Utah Company

The Utah Light & Traction Company has reported that it is about to undertake a $350,000 improvement program. The announcement of the proposed project was made by E. O. Howard, president of the company, at a luncheon in Salt Lake City recently.

Rock Island Places Five Electro-Gas Cars in Service

Five electro-gas-driven cars have recently been delivered to the Chicago, Rock Island & Pacific Railroad. They will replace steam train service on branch lines. The cars will accommodate 77 passengers. Their motors develop 275 hp. and provision has been made for the installation of another motor of the same rating. They are designed at present to haul one trailer. General dimensions are as follows: Engine room, 10 ft.; baggage and express compartment, 11 ft. 6 in.; smoking room, 9 ft.; main compartment, 38 ft.; width, that of a standard steel coach.

The cars were designed by J. E. Wanamaker, chief electrical engineer of the Rock Island, and they were jointly built by the St. Louis Car Company, Electro-Motive Company, Winton Engine Company and General Electric Company.

The car trucks are of the cast-steel type, and the frames, of one piece, were furnished by the Commonwealth Steel Company, East St. Louis.

Duco lacquer of olive green color, the Rock Island standard, was chosen for the outside finish. The inside trim is of Honduras mahogany, natural finish. Ample basket racks are conveniently located for the passengers. Toilet and drinking fountain facilities are located in the rear end of the main passenger compartment.

The Rock Island converted two of its 45-ton steel cars into gas-electric units of this type. Work was done in the company shops at Horton, Kan.

In addition to the five passenger cars the Rock Island, in its own shops at Horton, Kan., has completed the conversion of two 40-ft., 45-ton steel cars into two gas-electric units, each being equipped with two sets of 275-hp. units, the motors being designed with sufficient capacity for use in continuous low-speed heavy freight service. These power plants are so built and installed that they can be controlled as one unit, with a total capacity of 550 hp. The engine man is able to run one or both power plants to meet the schedule requirements, cutting the power plants in or out as may be necessary for capacity and economy. One power plant handles the motors on the forward truck and the second one handles the motors on the rear truck. Twenty of the 40 ft. in the car is left for use for revenue service.

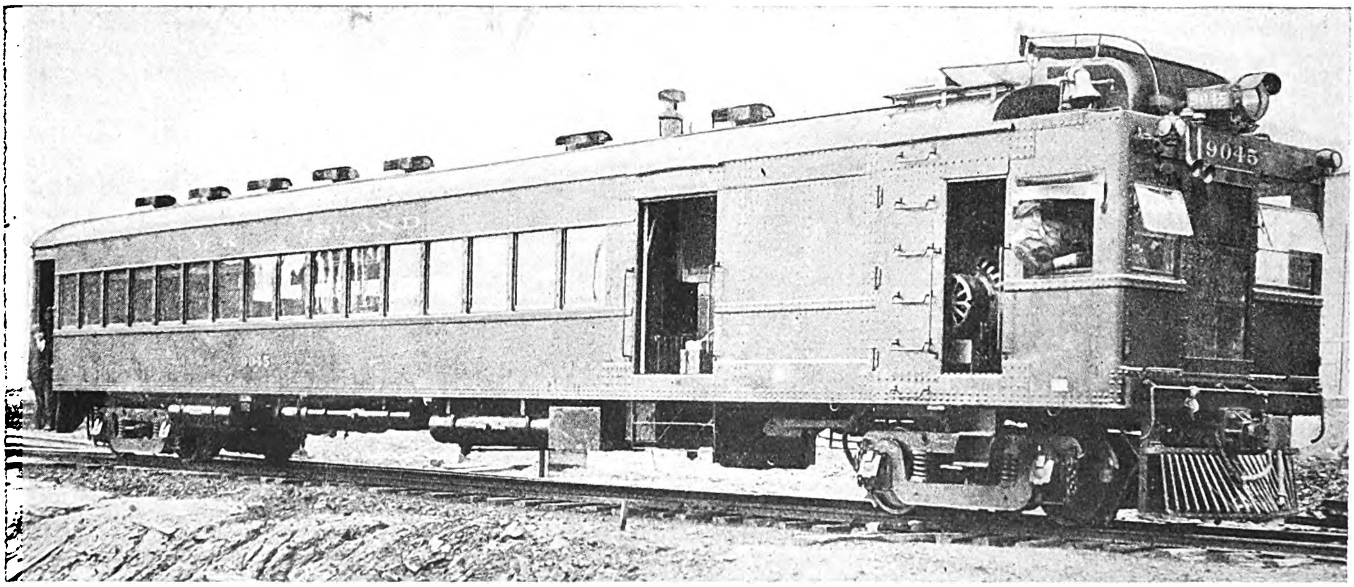
The cars as converted weigh approximately 75 tons each and are designed for pulling two or three trail cars in regular local passenger service. One of these two cars was first equipped with a low gear ratio so as to carry on some experimental work to determine their adaptability for light switching and light local branch line freight service. Upon completion of the experiments the low ratio gears were replaced with standard passenger gears, as the cars are to be used in local passenger service.

F. R. Fageol Heads New Ohio Company

F. R. Fageol, first vice-president of Fageol Motor Company of California, and formerly vice-president and director of American Car & Foundry Motors Company, with which Fageol of Ohio was merged in 1925, is now president of Twin Coach Company, a newly organized corporation. The company was founded by a group of Northern Ohio capitalists, and will begin operations shortly in the former Fageol Motors Company plant at Kent, Ohio. The Twin Coach Company is a Delaware incorporation, with capital of $4,000,000 of 8 per cent preferred and 400,000 no par common shares.

Secretary of Commerce to Address Trade Convention

Foreign traders from 40 states will listen in Detroit to an address by Secretary Hoover to be made May 26 at the fourteenth National Foreign Trade Convention. The convention will meet on May 25, 26 and 27 and 2,500 foreign traders are expected to attend. The Secretary's subject will be "American Foreign Trade" and a nation-wide radio



Five of these electro-gas units were recently placed in service by the Rock Island to replace steam trains on branch line service audience will listen in to what is anticipated to be one of the notable business addresses of the year.

More than 40 speakers, prominent in all phases of the country's foreign trade activity, will address the convention's thirteen group and general sessions. Some of those who appear on the program include Julius H. Barnes, president of the Barnes-Ames Company, New York; W. F. Gephart, vice-president of the First National Bank, St. Louis; Turner Jones, vice-president of the Coca Cola Company, Atlanta; Prof. L. D. O'Neil of Boston University; John A. Russell, editor of the *Michigan Manufacturer and Financial Record;* W. C. Sproull, advertising manager of the Burroughs Adding Machine Company; ex-Gov. James P. Goodrich of Indiana; J. A. H. Kerr, vice-president of the Security Trust & Savings Bank, Los Angeles; Robert V. Beucus, advertising manager of Bauer & Black, Chicago, and C. C. Martin of the National Paper & Type Company, New York.

New Financing Plan Proposed for Seattle Cars

A new plan for financing the purchase of new street cars for the Seattle Municipal Street Railway, Seattle, Wash., despite pending litigation which has apparently closed the market to railway department bonds, is under consideration by the City Council. The plan would not enable the city to procure at once the 80 new street cars which were authorized in an ordinance for the sale of $1,420,000 in bonds enacted before the railway became involved in the litigation, but it would provide funds for the railway department to buy the cars in lots of perhaps four or five. Councilman Ralph D. Nichols suggested the plan. Under it funds set aside annually by the water department into a sinking fund for bond redemption would be used to purchase interest-bearing utility warrants issued by the railway, the proceeds of these sales to be used by the railway in purchasing new cars.

The suggestion was prompted by an ordinance which came before a committee of the Council authorizing the investment of $78,000 from the water bonds redemption fund in street railway warrants, issued two years ago for the construction of the Fifteenth Avenue Northeast extension of the railway system. These warrants are bought by private firms at a discount of 8 per cent from their face value.

Rolling Stock

Brooklyn & Manhattan Transit Corporation, Brooklyn, N. Y., placed in service last week the first of the 67 articulated cars ordered nearly a year and a half ago, and which were mentioned in the JOURNAL for Dec. 25, 1926. Eight additional units will be ready within a few days. The new car is running on the Fourth Avenue line between 95th Street and the Queensborough Plaza.

Petaluma & Santa Rosa Railroad, Petaluma, Cal., has been authorized by the Railroad Commission to remodel its passenger equipment in order to operate the same as one-man safety type cars with dead-man control. This action was taken by the commission following a hearing conducted by Commissioner Leon O. Whitsell at which the utility submitted its record of earnings showing deficits as follows: 1926, $36,401; 1925, $26,133; 1924, $26,006; 1923, $33,270; 1922, $16,287. The utility operates three lines from Sebastopol, Sonoma County. The use of one-man cars is proposed for a period of six months as an economy measure. Rigid safety regulations are contained in the commission's authorization for the operation of one-man cars. The system comprises 33 miles of track.

Track and Line

Oregon Electric Railway, Portland, Ore., has agreed to pay 30 per cent of the $60,000 cost of an overhead crossing above its tracks on the Capitol highway at Multnomah station.

Seattle Municipal Street Railway, Seattle, Wash., has been authorized by the City Council to make four extensions to the city's street railway lines, to cost $52,500. Three of the improvements will be in the University district and the other in the southern end of the city.

Worcester Consolidated Street Railway, Worcester, Mass., is prosecuting work on the many improvements involving an expenditure of $1,500,000 in that city. A force of 150 men is relaying double track in Park Avenue from May Street to Main Street, a distance of 7,000 ft.

Municipal Railway of St. Petersburg, Fla., is relaying rails on the Big Bayou line at the approaches to the new concrete arch bridge over Salt Creek.

Wisconsin Traction, Light, Heat & Power Company, Neenah, Wis., and the **Wisconsin Power & Light Company** have agreed to use the same car tracks in Neenah. The track formerly used by the cars from Appleton will be torn up. Both companies will use the tracks over which the Oshkosh cars were formerly operated. A new curve will be constructed to connect the two lines on the one track on East Wisconsin Avenue.

Municipal Railway, Seattle, Wash., is reported as about to commence work on a regrading and retracking project on the Westlake Avenue street car lines. The work will cost $85,000 and will include cutting down the roadbed from 1 ft. to 3 ft. from Valley Street to the south end of the Fremont bridge, laying new rails and ties on the double track and temporarily rerouting Fremont bridge cars over Dexter Avenue. Eight crews of 30 men each will be assigned to the work. In addition to this, after a hearing, attended by 300 residents of the Ballard district, the utilities committee of the Council voted to recommend passage of an ordinance appropriating $42,300 for the construction of a double street railway track along Fifteenth Avenue Northwest to 67th Street and a single track line from 67th Street to 85th Street, which is on the corporation line of the city.

Shops and Buildings

Kansas City Public Service Company, Kansas City, Mo., is reported as the purchaser of a triangular shaped lot of approximately one acre, fronting on Summit Street at 41st Street, which will be used as the site of a new carhouse to care of its work cars. The property adjoins that bought by the company last January.

Springfield Traction Company, Springfield, Mo., through A. E. Reynolds, general manager, has announced tentative plans for the erection of a modern garage to take care of the general overhauling and painting of buses. The work will be started on the project just as soon as the plans are drawn. The building is scheduled for completion by early fall. According to the tentative plans the plant will have a capacity of 25 buses and is to be divided into a modern machine shop, heating plant, painting and washing departments.

Worcester Consolidated Street Railway, Worcester, Mass., has obtained a permit to build a carhouse on Grove Street. The new structure will be erected on land that has previously been used for sidetracking and storing the extra cars of the company in the open air.

Trade Notes

Society for Electrical Development, Inc., New York City, announces that new general offices of the society are now in the Graybar Building at 420 Lexington Avenue, adjoining the Grand Central Terminal.

H. B. Chamberlain, who entered the employ of the Tuco Products Corporation, New York City, in 1910 and who in the past few years has been assistant to D. W. Pye, president, has recently been appointed vice-president, with headquarters at 30 Church Street.

Robert T. Kent, until recently superintendent of prison industries for the State of New York, has been appointed to the position of general manager of the Bridgeport Brass Company, Bridgeport, Conn.

J. de N. Macomb has been appointed assistant to the vice-president in charge of railroad sales of the Inland Steel Company, Chicago. Mr. Macomb was graduated from the University of Kansas in 1898 with the degrees of B.S. and M.S. He entered railway service with the Atchison, Topeka & Santa Fe Railway on Aug. 1, 1899, and has been in the employ of that company continuously.

New Advertising Literature

American Brown Boveri Electric Corporation, New York City, announces that circular No. D.M. 10,000 is available for distribution. This sixteen-page illustrated publication describes the A.B.B., Camden, N. J., plant, organization and products, particular emphasis being placed on the company's most recent engineering achievements in industrial fields.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, May 28, 1927 *Number* 22

Latest Developments in Chicago Point Toward a Successful Solution

ENCOURAGING transportation news comes from Chicago. An important step has been taken toward unraveling the complicated tangle into which the country's second largest city has permitted its transportation facilities to become ensnarled. An agreement has been reached among the transportation companies on a general program. It is the logical first step toward a solution of that community's outstanding problem.

Again the old formula of straightforward business methods seems to have worked. Once the parties at interest were able to get around a table and frankly to compare their views—motivated by a sincere desire to find a solution which would be at once fair to the community and to the security holders—order began to come out of chaos and the tangled mass of conflicting interests has begun to unravel. Even the hardest knot of all—home rule regulation—shows signs of giving way before patience and co-operation. A suggested county transit commission, consisting of two representatives appointed by the Governor, two by the Mayor and one by the county board, sets up the mechanism for a regulatory body which will be both sympathetic to the city's needs and at the same time protected in a measure from destructive local politics.

Progress in the solution of Chicago's transportation problem has only started. But it *has* started. There are still many hurdles ahead, the first of which is the State Legislature, where five enabling bills must be passed within a month. The City Council and the Mayor have not yet openly expressed their stand. After legislation is passed—if it is passed—there is a franchise to be negotiated. Finally, the whole proposition must be submitted to a referendum of the city's voters.

On the face of things, then, Chicago still is a long way from a final settlement. But there are some very significant factors that point strongly toward ultimate success of the present program. A united front among the companies is the first and probably the most important. They have, however, gone further than that. They have not only agreed on a program, they have openly and frankly stated it. They have put all their cards on top of the table; have gone to the Legislature with what they consider the best plan for the healthy improvement of transportation and have openly told the city and its people that there is no cleverly worded legal phraseology in which jokers are hidden.

This time the Chicago problem is being approached in what must impress all parties at interest as a straightforward, businesslike manner. The modern conception of business dealings is that both parties gain from a transaction. The old theory was that one party is always the loser. Transportation as an industry has suffered much from application of the old principle in dealings between a community and its transportation companies—and the communities have by no means been the only offenders. Chicago is beginning to apply modern business methods to work out its transportation difficulties—and those methods have been successful in every other city where they have been applied.

An Unforgettable Lesson from the Skies

ROGET'S THESAURUS has been exhausted by men and women in every walk of life, in every clime and nation, to praise the incomparable feat of Charles Lindbergh. This blonde scion of a pioneer race is a man whom "the gods delight to honor." In less than 40 hours he advanced the science of transportation to a degree that inflames the imagination and benumbs expression. He "splashed at a ten-league canvass with brushes of comet's hair." The trajectory of his roaring plane described another rainbow for the hearts of men. Hurtling through the uncharted ether, a young man dreamed dreams while old men saw visions.

Our ardor for his physical feat may cool with the years. We may forget the encomiums of kings and presidents, but deep in the consciousness of the American people will always live the tremendous lesson which his daring revivified. In short, that the courage of one's convictions is the lifeblood of the pioneer.

None of us is too great to relearn this lesson which an American youth, this Navigator of Progress, blazoned across 3,000 miles of the heavens.

Workmen's Automobiles— An Economy or a Luxury?

RIDING to work in a private automobile is cheaper than using public transportation, according to an editorial published in the April issue of *Scientific American*. Operating costs are figured in the editorial at 15 cents per automobile-mile, or 5 cents per passenger-mile, on the basis of three persons per vehicle. The fare on the local car and bus line is 10 cents. Apparently science and economics have become jumbled in the thoughts of the writer of this editorial, because he has neglected entirely the vital factor of distance traveled. In the instance to which he refers, the distance probably averages about 4 miles, making the actual cost per trip approximately 20 cents per passenger by automobile, or double the cost of public transportation.

An investigation made last summer by the Norton Company, Worcester, Mass., to discover how many of its employees came to work by automobile was the basis for the editorial. The company found that 740 automobiles were owned by its 2,900 employees. Of these 419 were driven to work daily, carrying on the average three employees each, or 1,257 in all. Thus approximately 40 per cent used automobiles to reach the plant. This investigation was made to determine what parking facilities were needed.

No study was made by the Norton Company of the relative cost of various means of transportation. Nevertheless, as many of the automobiles used by the employees were found to be of small, light types, the average operating cost is doubtless about 15 cents per vehicle-mile, or 5 cents per passenger-mile, as assumed in the *Scientific American's* editorial. As a matter of fact, investigation shows that the cost is seldom if ever divided equally among the three passengers, but is borne largely by the automobile owner. Hence the assumption of 5 cents per passenger-mile operating cost is hardly justified. Moreover, the Norton plant is some 4 miles from the center of Worcester, and many of the employees must travel that or a greater distance to reach their work. When this important factor is considered, the economic advantage swings over quickly to the 10-cent common carriers.

After all that has been written of late about the relative cost of operating street cars, buses and automobiles, it is surprising to find any one who thinks that private transportation is cheaper than public transportation. Tireless efforts are required, however, on the part of the transportation agencies to counteract the mischief done by the dissemination of these false theories. The old adage that the shoemaker should stick to his last still holds good.

For Thirty Years This Company Has Paid Dividends

EVEN allowing for what some are inclined to look upon as a very favorable operating arrangement with the city, the Montreal Tramways management is certainly doing an exceptional job. This is reflected in the digest of the annual report of the company published elsewhere in this issue. The surplus for the year after paying four quarterly dividends of 2½ per cent each, which called for the disbursement of $400,000, was $279,159. Carried forward from the previous year was an accumulated surplus of $1,014,037, so that the surplus at the end of the year recently ended was $1,293,197.

In the face of a showing of this kind it might be expected that there would be a disposition to permit things to remain as they are and to sit back and garner the reward of what has been done in the past. There is, however, no such attitude. The company proposes to carry on and carry on intensively. To this end the directors expect to submit to the civic authorities a general plan of improvement embracing subways and elevated railways.

The railway at Montreal does not operate under conditions that are ideal. The city's climatic conditions, with storms of exceptional severity, constitute a serious problem. Moreover, the grades there are heavier than in any other Canadian city except perhaps Quebec, where the traffic density is not so great as it is in Montreal. Again, the city's older thoroughfares, dating from an age-long past, are very narrow, so that in these sections the railway has a limited use of its own right-of-way. Despite these natural handicaps, the people of Montreal are carried from point to point, season by season, with a minimum of delay and discomfort. Many of these factors are not apparent in the annual report, but they have an important bearing in interpreting the results achieved.

The cynic who may be inclined to scoff at repetition of the aphorism that virtue is its own reward should turn to the record of dividends paid by the Montreal Tramways covering an uninterrupted period of 30 years, and to the statement of the accumulated surplus as it stood on Dec. 31, 1926. As for the officers of the company, it should be heartening to them to know that their efforts to improve the roadbed wherever necessary, increase the fleet of buses, add to the rolling stock and otherwise keep abreast of the times are not escaping public recognition.

Greater Uniformity Needed in Operation of Traffic Control Signals

RADICALLY different rules exist in neighboring cities having traffic control signals. In 27 such cities in New York State nine conflicting regulations are in effect. Only the natives know what is expected of the automobile driver in any particular municipality. Many of the regulations are confusing even to the natives. For example, a traffic policemen in a small town recently explained the local rules by saying, "To turn to the left, you pull over to the right, and when the signals says 'stop' you go."

To remedy the present chaotic conditions a committee appointed by the New York State Conference of Mayors and Other Municipal Officials and the Empire State Gas and Electric Association recommends the adoption of a uniform practice. The recommendation is based on a study of existing practices throughout the state. An abstract of the report of the committee appears elsewhere in this issue. Only general suggestions are made concerning the type of signals and their location. Definite recommendations, however, are made concerning the operation of the signals.

In the opinion of the committee only two colors, red and green, should be used in traffic control signals. The amber light often used between the red and green lights is believed to be unnecessary. Pedestrians should cross an intersection in the direction of moving traffic or during an interval when red lights show in all directions. In warning signals, as differentiated from control signals, the amber light should be used exclusively. All turns should be made on the green light, except as otherwise directed by a police officer or where diagonal streets or other unusual conditions make a variation necessary.

It is emphasized that the purpose of automatic traffic signals is to expedite traffic movement rather than to hamper it. If the system is to be successful, the duration of stoppages due to the signals must be less than would occur without them or the delay must be offset by greater ease or safety of movement. Synchronized progressive and co-ordinate systems are discussed in detail in the report. The progressive system provides continuous movement and discourages speeding. An objection to this system, however, is the necessity to have equal periods for the red and green lights. That is unsatisfactory where there is more traffic on a principal thoroughfare than on the cross streets. Synchronized control is open to criticism because traffic is brought to a dead stop periodically and unnecessary delays often result.

What the committee characterizes as co-ordinated traffic control was developed to overcome the objections to the other two systems. The committee believes that the selection of a particular system must depend largely on the conditions that exist on the street on which the traffic control system is to be used.

Whether or not all of the recommendations meet with general approval, there can be no doubt that standardization is urgently needed. A long time must elapse before the present conflicting regulations are brought into uniformity, but with patience and perseverance it can be done. Standardization of railroad gages has been accomplished, although it was once thought to be impossible. So, too, standardization of traffic control can be accomplished when the resultant advantages are brought home to the public. The report of the committee represents an important step in this direction.

Its Dividends Far Exceed Its Premiums

THE National Safety Council is the spiritual as well as practical expression of the brotherhood of man in industrial life. No one can attend its meetings or review its tremendous achievements without realizing that membership in it is of inestimable value. No other form of life insurance is as cheap considering the benefits it bestows. One does not have to die to realize these benefits. Its dividends far exceed its premiums; premiums that are expressed in healthy, happy, unmaimed men and women. Figure its worth in terms of dollars and cents: Membership per 10,000 employees is only $250. Granting that in a year, by reason of the council's teaching, one life is saved valued at $10,000, there has been made not only a lucrative investment but a definite contribution to humanity.

The council is a co-operative, non-profiting association that numbers among its members the greatest minds in industrial life. Every minute in the day through its agencies human life is being conserved. This alone should make it imperative that every industrial organization and every other organization whose ideal is service should be enrolled as a member.

Florida—and Some Other States—Needs to Get Up to Date

FLORIDA is behind the times in its dealings with public utilities. It is so far behind the times that it is about 30 years out of date. In 1899 it passed a law limiting franchises to a period of 30 years. At that time the public utility industry was in its infancy, particularly in Florida, and it was supposed that irrevocable stipulations could be made for rates, charges and service. To correct this condition a terminable permit bill has been introduced in the Legislature.

So out of date are some people in Florida that it has been found necessary to explain the terminable permit by the eclectic method, despite the fact that the Railroad Commission has on more than one occasion materially increased railway fares fixed by contract, and that the Supreme Court of Florida, confirmed by the Supreme Court of the United States, has held that the Railroad Commission has this right and that it is its duty to make rates compensatory.

To this end Peter O. Knight, president of the Tampa Electric Company and author of the bill recently introduced, is using large newspaper space to enlighten the Legislature. He is reminding the people of Florida that the terminable permit idea has been indorsed by the National Association of Railroad and Utilities Commissioners, Investment Bankers Association of America, the American Bar Association, the National Municipal League, the National Civic Federation and the wartime Federal Electric Railways Commission.

Mr. Knight's statement was made of his own volition. It is a forceful presentation for which he takes entire responsibility, if such a term may be applied to a measure intended to operate in the best interests of everybody concerned and destined to bring Florida up to date with respect to its dealings along economic lines with the utilities which operate within its borders. Yet Mr. Knight has felt it necessary to offer to debate the merits of the bill before the joint session of the Legislature. So far there has been no indication that his challenge is likely to be accepted.

Nothing more effective than the passage of this bill could be done to invite capital into Florida under assurance that its rights will be fully protected. The author of the bill is correct when he says that common sense, good business and integrity all demand that when a public utility obtains a permit to do business in a community, it should be permitted, if it behaves itself and acts properly, to continue with its business unmolested, unless, perchance, the municipality sees fit to purchase the property. There can be no two sides to this question. The matter is incontrovertible.

Less Law and More Common Sense Needed

BEHIND a mahogany bench on a low platform sat three men. Two were chuckling together over some joke. The third dozed. Seated immediately in front of this bench was a middle-aged man fumbling with a mass of papers. In a wearied tone, he was answering questions asked by a bespectacled lawyer at a nearby table, frequently consulting his records for data before replying. From outside came the clatter of street traffic, drowning for short periods the monotonous sequence of question and answer. Apparently the lawyer was trying to trap the witness into some admission that could be used against him later. Nine-tenths of the questions had little or no bearing on the subject under discussion, serving merely to cloak those of real import. Here and there around the large room were scattered six or seven other men. One was reading "Breezy Stories." Another was standing looking out of the window. Several were whispering together. Between trips to the adjacent hallway to "catch a smoke," a couple of newspaper reporters took occasional notes. It was the fourth day of a hearing before the state regulatory commission, sitting to determine the reasonableness of certain fares charged by the local transportation company.

Proceedings such as this are the besetting sin of our present method of utility regulation. Reason and common sense are discarded, while valuable time is wasted in tedious legal arguments—often far away from the point at issue. The public—theoretically an interested party—has neither the inclination nor the ability to follow the endless twistings and turnings of the testimony. Despite their best efforts, the regulatory officials cannot give continuous, close attention to the rambling debate. If in the end a sensible decision is arrived at, it is in spite of these protracted hearings, not because of them. What is needed to improve our methods of utility regulation is less law, fewer lawyers and more common sense.

Standardization of Traffic Signals Recommended

Joint committee of municipal officials and representatives of lighting industry in New York State suggests general adoption of two-color indications with all turns made on green light

ADOPTION of standards for the design, location and operation of traffic signals is recommended by a joint committee of the New York State Conference of Mayors and Other Municipal Officials and the Empire State Gas and Electric Association. The findings of the committee are based on thorough investigation and study. Particular attention has been paid to automatic signal installation. It is recommended that the only colors which should be used in traffic control signals are red and green. Turns should be made on the green light. In warning signals amber should be used exclusively.

In reply to a questionnaire sent out by the New York State Bureau of Municipal Information at the request of the committee, 27 cities stated that they had traffic control signal lights in operation. Of these cities two reported that traffic control signal lights were being installed at the time; even stated that they were installed in 1926 and in six cities they were installed in 1925. In other words, within the past two years nineteen cities of the 27 have undertaken this type of traffic control. This indicates that city officials are giving considerable attention to the subject and also illustrates the need of careful study in order that the best practices may be developed and standardized.

Only one of the 27 cities reported that the lights were not proving successful. In this particular place the officials seem satisfied with the principles of signal light control, but do not feel that their system is adequate for local needs. They state that a change is being considered.

Ten cities reported that the introduction of traffic control lights had effected a considerable reduction in their accidents. One estimated this reduction to be 80 per cent, and five other cities reported that no accidents had occurred at intersections where the signal lights were in operation. Eleven cities stated that the lights had effected considerable relief in traffic. One city claims that this relief is due to the fact that drivers avoid the signals and thus use streets that are not so congested.

In answer to the question, "Are your lights operated singly or from a central station?" the following answers were received:

Singly operated	11
Operated by groups	2
Operated from central stations	9
Combination of central station and central operation	4
No answer	1

The answers to the question, "Are they operated on a synchronized or stagger plan?" are as follows:

Synchronized	16
Individual operation	7
Stagger system	2
No answer	2

In reviewing the returned questionnaires, it was evident that the officials filling them in did not understand the exact meaning of the "stagger plan." For this reason the figures given above are not believed to be absolutely correct.

Five cities report that they are now using the two-light system: One reports that it is now using the three-light system, but is planning to change it to the two-light system. The cities using the two lights seem to feel that this is the safest plan of operation. Only one city, which is now using the two-light system, has worked out a plan for overlapping these signals at the time they are changed.

There is considerable variance in the time allowed for each change of signal in the various cities. This ranges from as small an interval as twenty seconds to an interval of two minutes used for the north and south streets of New York City. The time allowed for the change interval varies from four to twenty seconds. Only a few of the cities make a difference of the time interval for the street of maximum travel as against the other intersecting thoroughfares. Fourteen cities report that the timing of the devices is standard for their community; that is, all lights are operated on the same interval and no change is made to satisfy changing conditions. Seven report that timing is designed to fit conditions at the intersection and four indicate that the traffic signal is operated by hand during heavy traffic.

The regulations in effect in the various cities for making turns at intersections where traffic control signals are used vary somewhat, as shown by the following list:

All turns on green light	16
Right turn on red, left turn on green	2
Right turn on either light, left on green	2
All turns on either green or amber	1
Both turns permitted on red light, if there is no interference	1
Right turn on green, left turn during change interval, but either turn on either color when turning off main street. Right turn on either color when turning off side street	1
No left turns permitted during busy hours	1
No rule on the subject	1
No answer	2

Fourteen cities report that they have no regulation for the control of pedestrian traffic at intersections where signal lights are used. Eight cities report that they have such regulations. Of the cities reporting no regulations three state that the matter is handled by the police officer on the post and that they have been able to obtain the co-operation of the public. Of those having regulations, the following experience has been obtained in enforcing them:

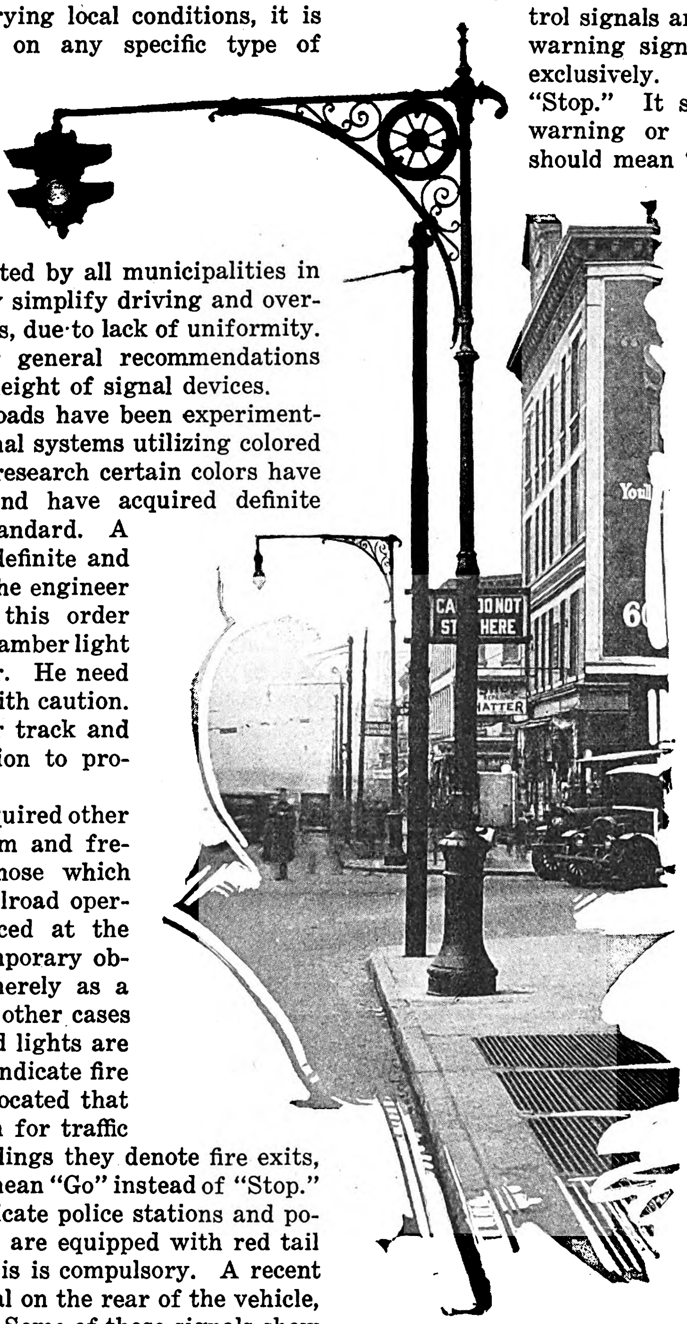
No difficulty	3
Slight difficulty	1
Very difficult	1
Not effective because of lack of penalty	1
No answer	2

On account of widely varying local conditions, it is impractical to standardize on any specific type of traffic signal or signs or any particular layout of control devices. It is possible, however, to recommend a uniform meaning of signals, which if required by state law or in the absence of such, if adopted by all municipalities in New York State, will greatly simplify driving and overcome the present complexities, due to lack of uniformity. It is also possible to offer general recommendations regarding the location and height of signal devices.

For many years the railroads have been experimenting with and developing signal systems utilizing colored lights. As a result of this research certain colors have come into universal use and have acquired definite meanings which are now standard. A red light is an order, very definite and in no case to be ignored, to the engineer to stop. Failure to obey this order brings severe penalties. An amber light is a warning to the engineer. He need not stop, but must proceed with caution. A green light means a clear track and gives the engineer permission to proceed freely.

Colored lights have also acquired other meanings quite distinct from and frequently contradictory to those which have become standard in railroad operation. Red lights are placed at the street excavations or on temporary obstructions, in some cases merely as a warning of danger, while in other cases a full stop is necessary. Red lights are also quite generally used to indicate fire alarm boxes, frequently so located that they may easily be mistaken for traffic control signals. Inside buildings they denote fire exits, and in this case they really mean "Go" instead of "Stop." Green lights are used to indicate police stations and police call boxes. Automobiles are equipped with red tail lights, and in some states this is compulsory. A recent development is the stop signal on the rear of the vehicle, in addition to the tail light. Some of these signals show red, some green and some amber. Devices are also on the market to indicate turns which are about to be made, and some cars, particularly taxicabs, are being equipped with numbers of colored lights, principally red, green and amber, for advertising or display purposes.

The use of colored lights to regulate street traffic is still in the developmental stage. Generally, an attempt has been made to adopt railroad signal methods and meanings to street traffic. The conditions are different and some confusion has been the natural result. This, with the variety of other uses of the same colors, makes it practically impossible for the motorist or pedestrian to know what is expected or required. Steps should be taken at once, first, to standardize on the colors to be used for the regulation of street traffic; second, to adopt definite and uniform meanings for such colors; third, to eliminate other uses of these colors where a different meaning is intended. Mention has been made above of some of these other uses.



Two color signals visible in four directions afford effective control

As a result of its study the committee recommends that the only colors which should be used in traffic control signals are red and green. In traffic warning signals, amber should be used exclusively. Red should always mean "Stop." It should never be used as a warning or cautionary signal. Green should mean "Go." Amber should mean "Proceed with Caution." It should be used exclusively and only for precautionary signals, either fixed or flashing.

In order to avoid confusion, all other use of red, green or amber lights, so located that they may be mistaken for traffic signals, the committee believes should be discontinued.

In some instances, due to the expense involved, traffic control signals are not placed at every intersection on a street where traffic control is desirable. Such a plan is not the most effective and should be considered only as a temporary one, intermediate signals being installed as soon as the finances permit. Until the system is completed, however, some plan should be adopted to prevent traffic from massing at the intersections where the signals are in operation and to inform traffic in cross streets of its approach to a signal-controlled street.

One of the most difficult and at the same time one of the most important problems in regulating traffic is the matter of turns, particularly left turns. Naturally, in the absence of any standard code, many different methods for solving the problem have been adopted based on strictly local conditions. They may be entirely satisfactory so far as local traffic is concerned, but there is now so much long-distance and intercommunity traffic that standardization has become highly desirable, if not absolutely necessary.

The replies to the questionnaire indicate that at least nine different methods are used in New York State alone for making turns at intersections where traffic is regulated by traffic control signals. The committee feels that purely local conditions should not be permitted to govern regulations affecting turns, but rather that all municipalities should adopt similar regulations on this point. The problem, therefore, is to discover the methods or rules which, on account of their logic, will appeal to the motorist and which will be most generally satisfactory and effective in reducing accident hazards and facilitating the movement of traffic.

Left turns interfere with and are dangerous to both vehicular and pedestrian traffic. Right turns may retard vehicular traffic, but are hazardous chiefly to pedestrians.

As far as is physically possible, drivers wishing to make a right turn should be encouraged to keep near the right curb; those planning a left turn should keep near the center of the street, and those wishing to go straight ahead should stay between these two lines. Some cities have found it advisable to indicate these three traffic lanes by markings on the street surface where the street is of sufficient width. In the majority of cases found in the congested areas of cities, the width of the street will permit of only two lines of vehicular traffic in one direction. Even here, however, drivers should keep near the side of the driving space toward which they wish to turn.

The left turn, where the corner is "cut," produces one of the most hazardous conditions at an intersection. Vehicles making such a turn intersect other lines of moving vehicles at dangerous angles and approach pedestrians from unexpected positions. In the opinion of the committee all left-hand turns should be made to the left of the center of the intersection. If, on the other hand, traffic were to follow a course to the right of the intersection it would twice intersect traffic.

If a red light is to be interpreted as an order to stop, and a green light as a permit to proceed, these meanings, to be consistent, should apply whether traffic is to proceed straight ahead or is about to make a turn. To specify that a driver wishing to make either a left or right turn should stop on green light and proceed on the red is inconsistent and tends toward confusion.

PEDESTRIANS MUST BE PROTECTED

The committee feels that no traffic signal system is complete unless in addition to preventing traffic accidents and congestion it also affords adequate protection to the pedestrian. It is the natural tendency of persons on foot to cross an intersection whenever an opportunity affords. It is difficult to control pedestrian traffic by signals. It would seem preferable, therefore, to provide opportunities for crossings by the use of signals to motorists, and to permit the movement of pedestrians only in conformity with the movement of vehicles. Pedestrians should be permitted to cross an intersection only in the direction of moving traffic or when all traffic is halted. This can be accomplished by local ordinance supplemented by education.

In recommending the use of only two colors, namely, red and green, in traffic control signals, the committee fully appreciated the need of an interval between the movement of traffic in one street and that in the cross street. This is essential in order that vehicles, and particularly pedestrians who have started to cross an intersection, as directed by a green light, may reach the opposite side before the traffic from the intersecting street is permitted to move. It is felt that in many instances this interval is of insufficient length to provide for the safety of pedestrians. It is the opinion of the committee that this interval should not be designated by the use of any additional color, such as amber, as there is a tendency on the part of drivers to take advantage of the change by speeding across an intersection or by slipping ahead into it, prior to an authorized change of traffic movements. This defeats the purpose of the interval and creates an unnecessary hazard, particularly where pedestrians are involved. It is felt that if the red light is shown in all four directions during the interval, this tendency and the resulting hazard would largely be overcome. It has been suggested that the application of this plan to certain existing signal systems would involve some expense and that an alternative arrangement be made whereby the red light would overlap the green during the clearance interval. The committee feels that such an arrangement would produce the same conditions as are now produced by the amber light and therefore would be unsatisfactory. It further feels that the expense involved of showing red lights in all four directions would be thoroughly justified by the additional safety secured.

It is impossible to suggest a standardization for the location of traffic control signals, as local street conditions and available finances will, of course, govern the actual layout. The committee, however, has considered the various methods in use at the present time and has listed three outstanding plans of installation at an intersection. These are given in the order which the committee feels should be given precedence.

1. Four lights, one on each corner, each light showing only in one direction, the controlling light in each case being the one on the far right corner to approaching traffic.
2. Two lights placed on diagonally opposite corners, each one showing in two directions.
3. One light located on one corner and showing in four directions.

The purpose of automatic traffic signals is twofold—to expedite traffic movement, not to hamper it, and to minimize accident hazards at intersections. All automatic signals, however, enforce the stoppage of one line of moving vehicles while the line on the intersecting street is proceeding. This period of delay should be less than would be caused under normal conditions if the traffic at the intersection was not regulated or the delay should be offset by a greater ease and safety of movement. Unless one or both of these conditions is produced, the delay is unwarranted. In other words, no automatic traffic signals should be installed unless they are essential. Furthermore, they should not be operated during hours of the day when traffic will move effectively at the given intersection without the signal. A traffic count made on several days and under varying conditions will provide an excellent guide as to the periods when each should be in operation.

ADJUSTING SIGNALS TO LOCAL CONDITIONS

It is frequently advisable to install an automatic traffic signal at an intersection of two streets that do not carry an equal flow of traffic or where the proportion of traffic on one street as compared with that on the other differs considerably at different hours of the day. At such places full consideration should be given to the relative flow of traffic in the two intersecting streets and the automatic traffic signal timed accordingly. For instance, if the normal traffic in a north and south street is twice as heavy as that in an east and west street, twice as long a period should be permitted by the signal for the movement of the north and south traffic. It may be necessary to change this timing interval at certain hours of the day to satisfy the changing conditions resulting from "rush hour" movement. The exceptional conditions at some heavy traffic intersections in New York City have made it necessary during certain "rush hours" to surplant temporarily the traffic signal by a police officer, who has authority to regulate traffic in accordance with immediate requirements, regardless of the signal. The more flexible the system the more effective it will be and the greater approval it will receive from the traveling public.

There seems to be a generally accepted principle that some interval should be allowed between the flashing of the red and the green signal. The purpose of this interval is not so much a warning of the impending change as it is to permit of a clearance of the intersection before such a change. As mentioned before, there is a tendency to indicate this period by overlapping the red signal on the green. This plan the committee disapproves, preferring the use of red lights in all four directions. The time of this clearance period should be sufficient to permit vehicles and pedestrians which have entered an intersection to reach the opposite side before the direction of traffic is changed. If the period is longer, unnecessary delay will be caused. If shorter, an accident hazard and a confusion of traffic will result.

The principles just outlined are fundamental to all traffic signal installations. The application of these principles is dependent on local conditions and local design. Although the practices followed in the operation of traffic signals are changing constantly as new and better methods are devised, those in use at the present time may be grouped under four general headings:

Individual Operation.
Synchronized System.
Progressive System ("Wave," "Platoon" or "Staggered").

Wherever the control or traffic of one intersection affects the movement of traffic at another controlled intersection some plan of co-ordination should be developed. Otherwise, unnecessary delays and crowding will result. Furthermore, the vehicles released at one intersection may just reach the next controlled one as the red light flashes on, thus forcing a stoppage. This is contrary to the principle of automatic lights that were designed to facilitate the movement of traffic and not to halt it unnecessarily.

SYNCHRONIZED PLAN IS SIMPLEST

The simplest method of co-ordination is the synchronized plan used originally in New York City. In accordance with it a number of signals are operated together as a unit. For instance, all the signals in the system will show red in the same direction at the same time and will be changed simultaneously. This permits of a north and south movement throughout the controlled section, while east and west movement is halted. Under the synchronized system the relative quantity of traffic or intersecting streets at a given intersection cannot govern the timing of the individual signal, but the relative flow of north and south traffic as compared with that of the east and west traffic throughout the area must be used to govern the timing of the entire system. Provision should be made for breaking the synchronized system into small units for emergency operation, and a hand-operated device should be installed at each signal.

WAVE PLAN PERMITS CONTINUOUS MOVEMENT

When the synchronized system is used all vehicles are forced to stop at least once during the change of signals. The progressive system sometimes called the "wave," "platoon" or "staggered" system and successfully operated on Sixteenth Street in Washington, D. C., was designed to overcome as far as possible this necessity for stopping. In accordance with it, all signals in the system are changed simultaneously, but they are grouped as to the color displayed.

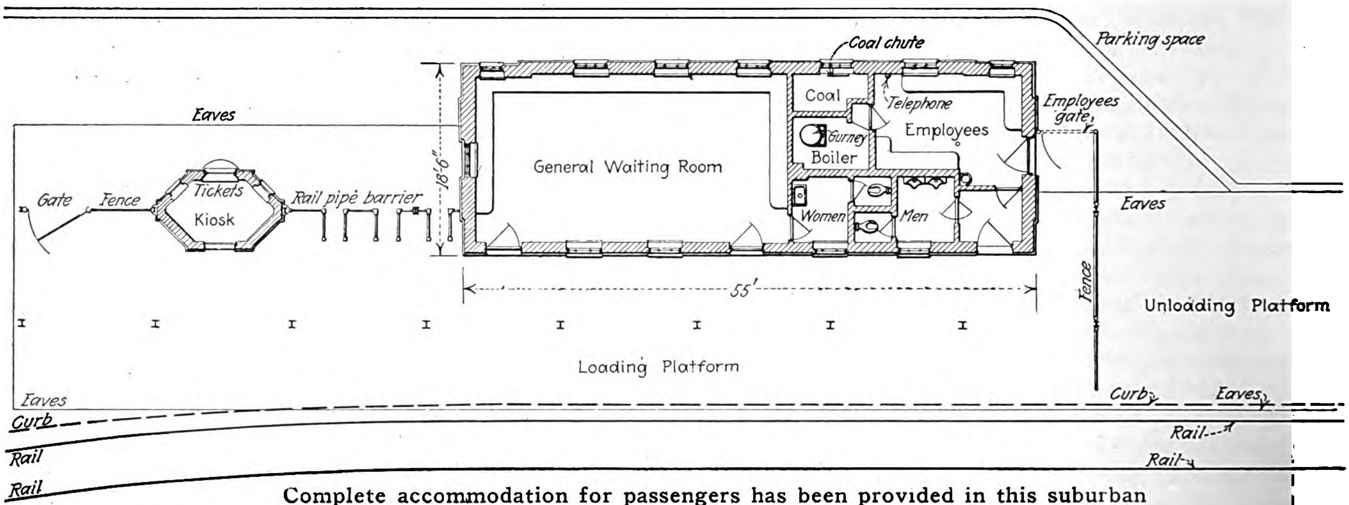
This plan permits of approximately continuous movement of traffic in both directions while at the same time it discourages speeding, as the speeder would be halted at nearly every intersection. The progressive system is most effective on a wide thoroughfare where blocks are of equal length. Where they are not, a varying number of blocks may be grouped in such a way that the driving distance of each group is approximately the same.

No consideration can be given under the progressive system to the relative flow of traffic, either in individual intersecting streets or by direction, considering the entire controlled area as a unit. On the other hand, the period permitted for the red and green lights must be of equal duration. In cities where a predominance of traffic is in one direction this works a rather serious handicap, particularly if the system covers more than one through street. The co-ordinated system being successfully used in the Loop district of Chicago was designed to overcome this difficulty and provide a system which, as far as practicable, would take into account local conditions at intersections and time of travel between the same. Each signal may be changed at a different time, but unlike the individual method of operation, the changing of all signals is co-ordinated. Similar to the progressive plan it provides for an approximately continuous movement of vehicles not exceeding the speed limit.

CO-ORDINATED SYSTEM IS MOST FLEXIBLE

The co-ordinated method of traffic control is one of the most flexible systems yet devised. This method, with the auxiliary apparatus required, may, however, most satisfactorily serve special traffic conditions. The co-ordination of traffic may be secured in two ways, either by central control or by the use of individual motors of a synchronous type.

In operating it a given intersection is selected as a starting point and the proper timing of its signal is determined. The next intersection is considered in like manner, but its cycle of changes is started a sufficient time after the start of the cycle at the basic intersection to permit vehicles to move from one to the other, considering speed limitations and conditions of travel. The same plan is then applied to each intersection of the selected street within the controlled area and is subsequently applied to parallel streets, taking into full consideration the result and effect on cross streets. Certain allowances will be found necessary in order to co-ordinate the system for the entire area, but the resulting ease of movement in the section as a whole should offset the disadvantages of these particular allowances.


Coal chute
Parking space
Coal
Telephone
Employees
Employees gate
Gurney Boiler
General Waiting Room
Eaves
Gate
Fence
Tickets
Kiosk
Rail pipe barrier
18'6"
Women
Men
Eaves
55'
Fence
Unloading Platform
Loading Platform
Eaves
Curb
Curb
Eaves
Rail
Rail
Rail
Rail

Complete accommodation for passengers has been provided in this suburban station of the Montreal Tramways

Montreal Tramways Installs Modern Suburban Station

ONE of the improvements recently made by the Montreal Tramways is a loading platform and station at the terminus of the Cartierville line, in the Parish of St. Laurent, on the island of Montreal. The former town of Cartierville is situated on the Rivière des Prairies, or what is locally known as "Back River," on the island of Montreal, and is now comprised in the area of the city of Montreal. The station is located on the Gouin Boulevard at a distance of 11.7 miles from the center of the city.

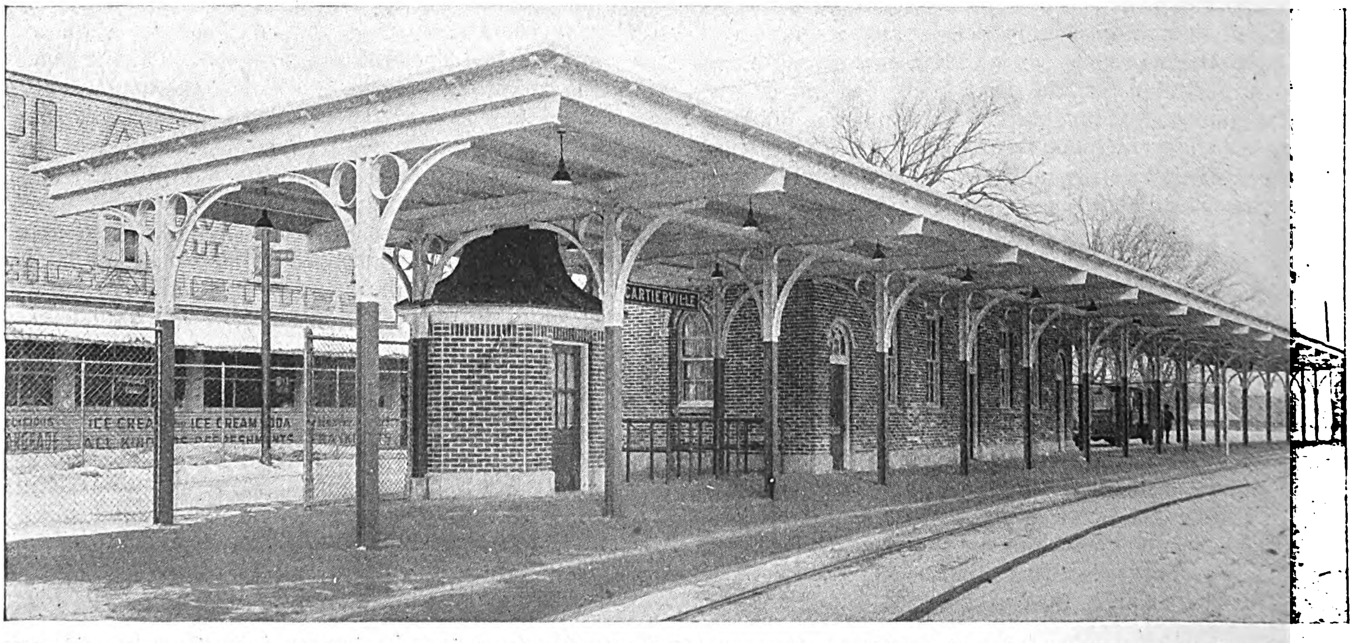
The building, situated between Ranger Street and the company's right-of-way, consists of a station and kiosk, both of rustic brick on Montreal limestone base and concrete foundation, with stone trimmings of Bedford limestone and flat center drainage roof of tar and gravel laid on gypsum slab.

The station, which is a one-story building about 55 ft. x 18 ft. 6 in., contains a waiting room, 30 ft. x 16 ft.; employees' room and conveniences for employees and public. It is heated by a hot water furnace.

The kiosk is used for the sale of tickets when the station is operated on the prepayment plan. It is used for the most part in summer, when the park and other features cause a congestion in this locality. The average number handled on Sundays and holidays during the summer months is between 25,000 and 30,000 people per day, the bulk of the traffic being in the afternoon and evening.

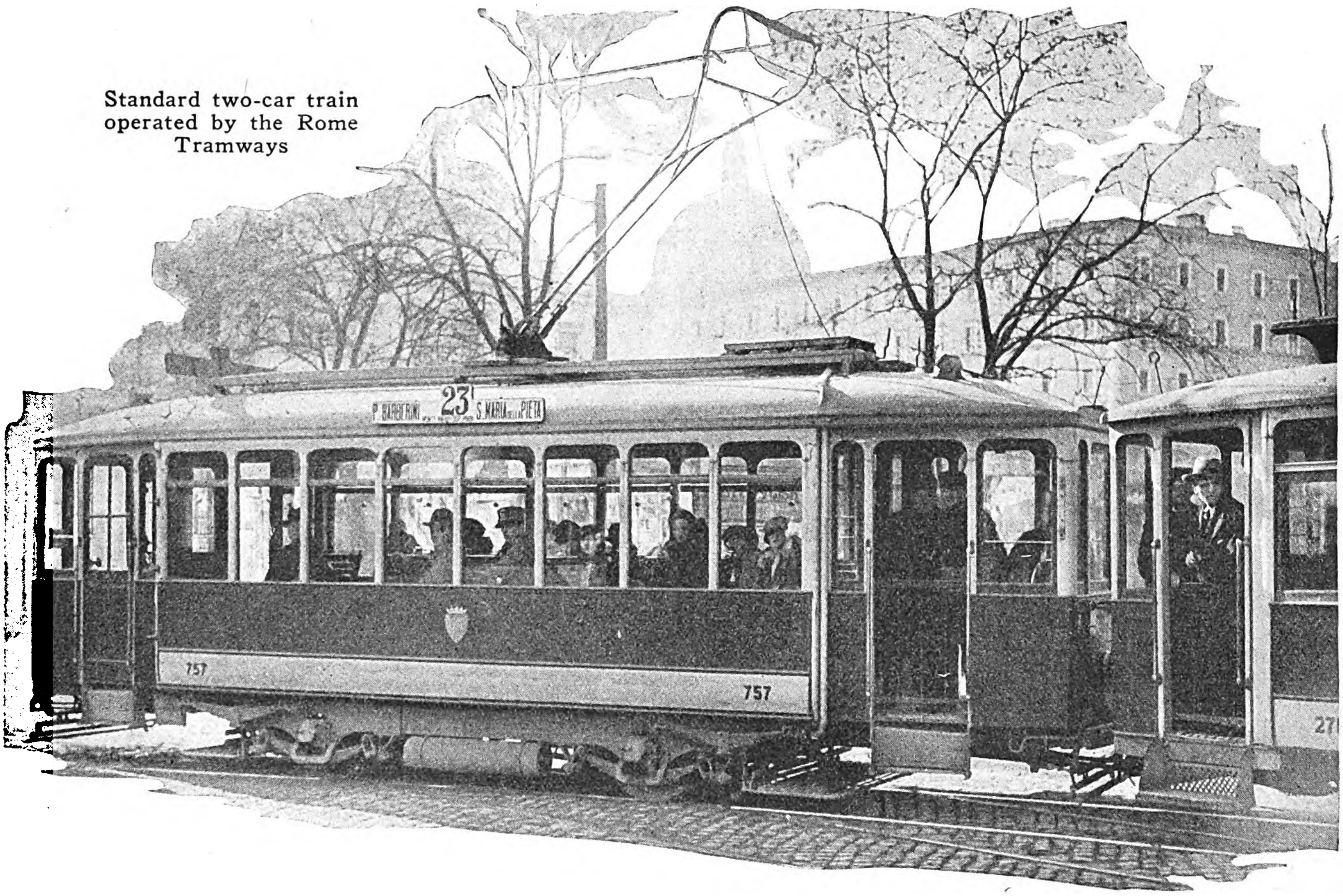
The platform has an average width of 22 ft. on the unloading side and 38 ft. on the loading side, with an asphalt floor laid on a 4-in. concrete slab on cinder foundation. It is covered with a center-drained roof supported on steel posts and I-beams, the roof being covered with "Armco" iron. A Paige wire fence divides the platform into two parts, the narrow part being used for unloading, the wider part, with gates, etc., being used for loading.

At the rear of the station, connecting Ranger Street with the right-of-way of the company and forming a loop with Gouin Boulevard, is a driveway paved with scoria block, for the use of motor buses, public vehicles and the like. It also provides parking space for taxis.


CARTIERVILLE

This attractive suburban station was built by the Montreal Tramways to provide shelter for passengers at Cartierville. It can be operated on the prepayment plan when desired

Standard two-car train operated by the Rome Tramways



Transportation in the Eternal City

Rome's hills and narrow streets in the downtown section complicate its transportation problem. Some favorable conditions are present and the trolley cars are carrying the bulk of the traffic

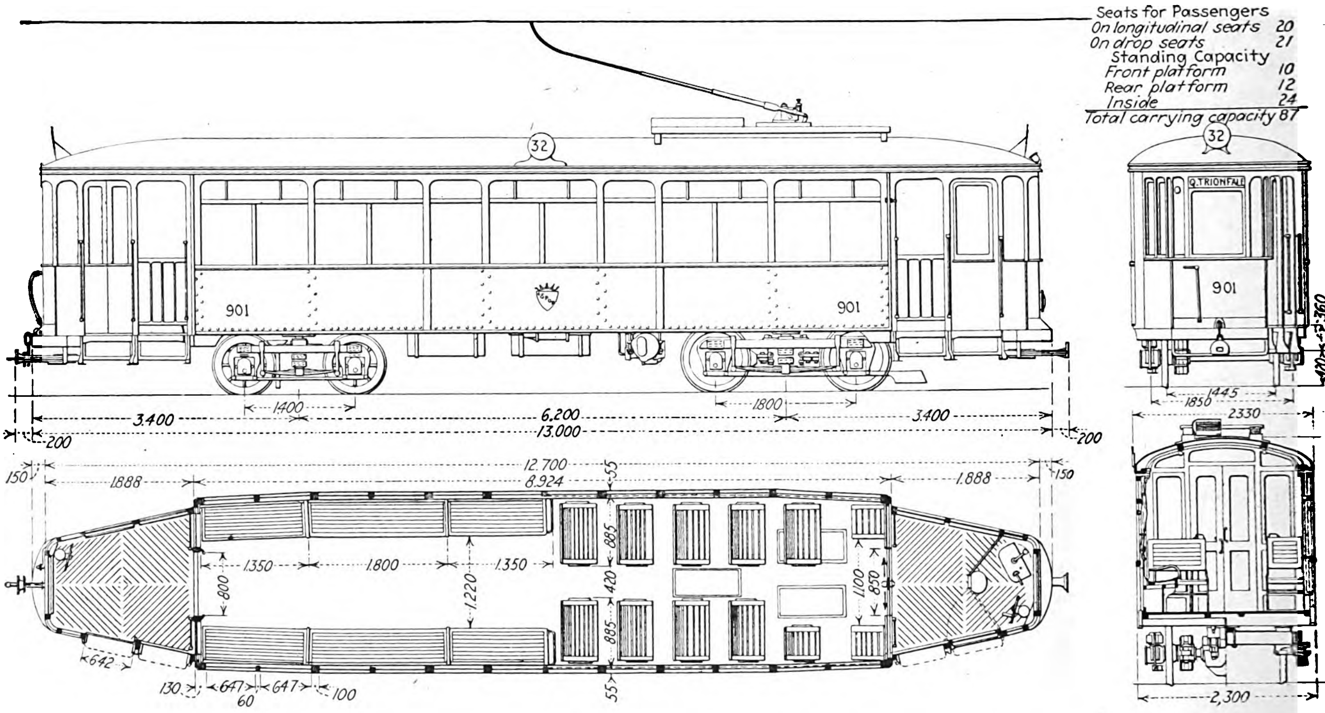
By Henry W. Blake
Senior Editor Electric Railway Journal

IN ROME, Italy, the main transportation problem is not different from that in American cities, namely, that of getting vehicles through the central district quickly. Conditions surrounding this problem in Rome, however, differ considerably from those in the average American city of like population. Some of these circumstances are more favorable to a solution, others less so. The less favorable circumstances will be considered first.

Chief of these is the narrowness and crookedness of the streets in the central portion of the city. In its newer portions, Rome has broad avenues and boulevards, often with a reservation in the middle or on one side for the car tracks, but in the center of the city streets are 25 ft. and 30 ft. wide, often with sidewalks only 24 in. wide. Some important streets even have no sidewalks. Most of the car line streets in downtown Rome are so narrow as to permit only one line of traffic in each direction. Thus, the Via Due Macelli, which leads into the important Piazza Di Spagna, has two tracks and is one of the three or four heaviest car traffic lines in the city, yet measures only about 8 m. (26 ft. 3 in.) from house line to house line.

Besides being narrow, most of the streets in the older parts of Rome, where the principal business district is located, are quite crooked, so that sharp curves in the electric railway track abound. At such points the head of the rail sometimes has to be laid within 36 to 40 in. of the house corner, so that at such places it would be somewhat dangerous for a person to stand while a car is passing. Finally, Rome is a city of hills, of which there are seven altogether. This means many steep grades with curves.

These handicaps to electric railway operations are undoubtedly great. There are, however, several favorable conditions. One is the comparatively small amount of other street traffic, except pedestrians. Automobiles, of course, are far less numerous in Europe than in the


Seats for Passengers
On longitudinal seats 20
On drop seats 21
Standing Capacity
Front platform 10
Rear platform 12
Inside 24
Total carrying capacity 87
32
Q. TRIONFALE
901
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2330
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Side view and plan, cross-section and end view of double-truck car now being built

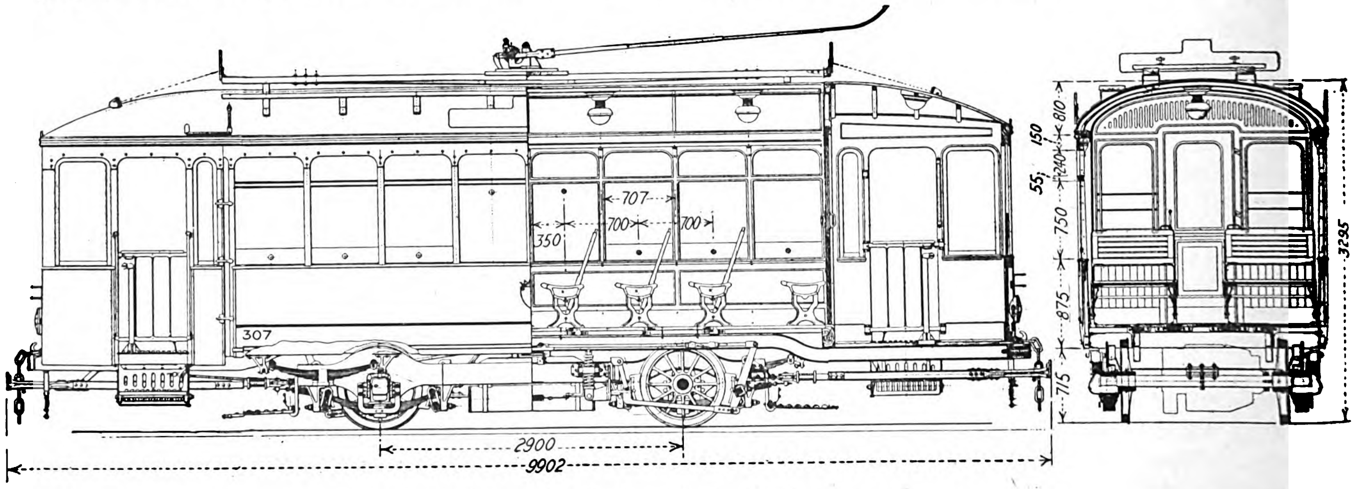
United States. Horse-drawn and auto taxicabs are present, with some private cars, but, as a whole, the vehicular traffic is much less dense than in cities of the same size in the United States. What there is of it besides the electric cars keeps as much as possible on the streets which have no car lines, or, at least, it keeps away from the narrow streets which have car lines. Fortunately, there are several broad thoroughfares of this kind through Rome. Traffic policemen are not much needed, and they are a comparative rarity.

Another favorable circumstance is a comparatively long spacing of car stops. This spacing averages 250 m. (835 ft.) in the center of the city and from 300 m. to 400 m. (1,000 ft. to 1,335 ft.) in the outskirts. This permits a fairly good schedule speed (about 12 km. per hour or 8½ m.p.h.) for cars within the city limits. Still another good condition is the favorable ordinances affecting electric railway operation.

The comparative absence of rush-hour and slack-hour traffic conditions such as exist on electric railways in cities of corresponding size in the United States is helpful to tramway operation. A more exact way of stating this circumstance perhaps would be to say that there are four rush-hour periods instead of two. As in many other cities in continental Europe ordinary business largely ceases during the noon lunch period. At this time most of the downtown offices as well as the stores (with the occasional exception of a large department store) are closed. The doors are locked, the shutters are put up and customers are not expected until the afternoon opening hour. The period of lunch varies from one to two hours. It begins at from 12 to 12:30 and ends at from 1:30 to 2:30 p.m. Rome is not alone in this custom, as has already been explained. It is followed also in Paris, Milan and other cities.

As most of the persons thus released from business go home to lunch (if not living too far away) the four peaks of the tramways can be understood. In consequence, largely the same headways are followed by the tramcars throughout the day and there is a very much larger proportion of straight runs for the men than in the United States.

Incidentally the explanation should be made that while the offices and stores close for a considerable period for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700
700
350
307
2900
9902
150
610
55
240
750
875
715
3295

Side and end view of standard motor car

déjeuner la fourchette, they work later in the afternoon than is customary in most American cities, i.e., the offices remain open until 7 or 7:30 p.m.

Hence, the railway system is able to offer good urban transportation, while its low fares and the many steep hills in the city are reasons for attracting passengers to its lines. Table I gives passengers carried during the six years 1920-1925 inclusive, nearly all of the lines being within the city limits.

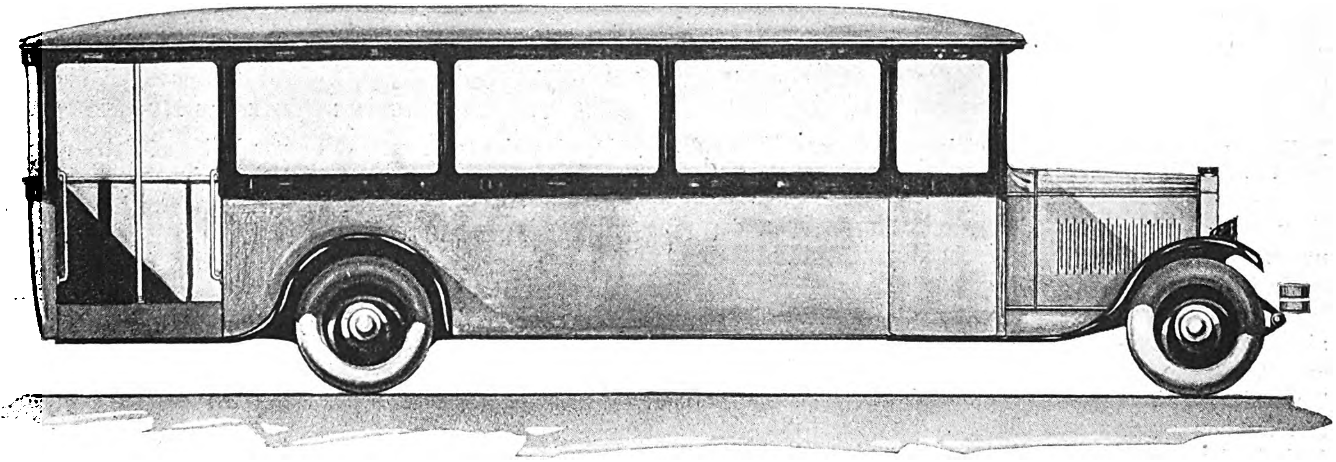
TABLE I—PASSENGERS CARRIED ON ROME TRAMWAYS SYSTEM

Year	Total	Per Motor Car-Km.*	Per Motor Car-Mile*
1920	140,696,992	11.368	7.105
1921	139,562,222	9.280	5.800
1922	144,233,975	7.568	4.455
1923	154,164,622	7.684	4.5554
1924	150,663,079	6.971	4.357
1925	186,635,463	7.129	4.456

* Based on one trail car-mile being equal to one-half a motor car-mile. This is the general European method of calculation.

TYPE OF CAR USED

At present the Rome system has a total of 400 motor cars and 267 trailers. Standard types of car used are shown in accompanying illustrations. Both motor cars and trail cars are mounted on single trucks. Elevation and section drawings also are shown. The seating arrangement varies in different cars. In the type illustrated, there are cross seats for two passengers each on both sides of the center aisle, although a large number of the cars, perhaps most of them, seat only three passengers across the car. With all seats except the four end seats holding two passengers each, the seating capacity of the car would be 28 passengers. With a row of single seats on one side of the car, its seating capacity would be 24. Slat seats are used.



Rome Tramways has ordered 30 buses of this type for feeder service

The remainder of the equipment includes a bow trolley, Westinghouse air brake with axle compressor, hand brake and short circuiting brake, two 40-kw. (53-hp.) motors and General Electric B-54-M controller. The starting resistance is on the roof. Completely equipped this car weighs about 14 metric tons (30,800 lb.).

The city is having two double-truck cars built for experimental use at the works of Carminati & Toselli, Milan. Plans and elevations of these two cars are shown in accompanying drawings. They seat 41 passengers each, and each has a nominal standing capacity for 46 passengers in addition. The front truck is equipped with two motors. The other is idle. The total weight is 15 metric tons (33,060 lb.), of which 9½ tons (20,940 lb.) is on the motor truck. Both cars are equipped with air brakes, and one with regenerative braking. The latter type was included primarily for safety and not for economy of current.

The wheels on both the present standard and the new cars are 800 mm. (31½ in.) in diameter, making a rather high two-step entrance and exit.

In the present standard single-truck car, the platform entrances on both sides are inclosed by hinged gates with interconnected folding steps. On the devil-strip side these gates are kept down, but in practice the gates on the curb side of the car are always kept open. In the double-truck car there are extra doors on both front and rear platforms. These doors are normally kept closed, but can be opened in case of heavy loading or unloading.

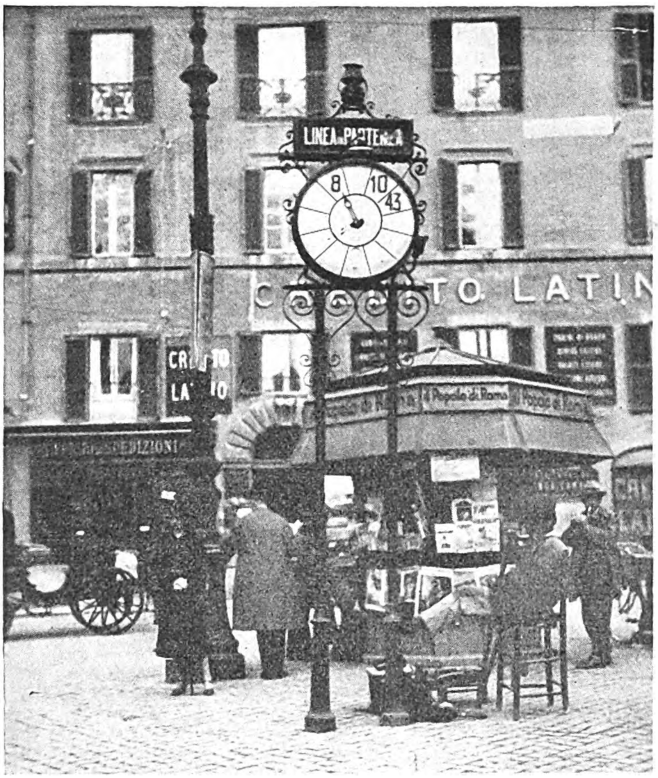
The exterior of the car is attractively painted a cardinal red on side panels and sash, with brownish yellow trimming. The crest of the city with the letters S.P.Q.R. (*Senatus Populus que Romanus*) appears in the center of the side panel.

The standard single-truck trail cars are similar in seating arrangement and general design to the single-truck motor cars. Not every motor car hauls a trailer. During 1925 there were about twice as many motor car kilometers run as trail kilometers, the figures respectively being 20,969,018 and 10,421,462. In Table I the method followed for calculating total ton-kilometers (or ton-miles) is the conventional one generally followed in Europe of including only one-half of the trail car-miles, on the theory that in cost one motor car-mile is about equal to two trail car-miles.

BUSES USED IN FEEDER SERVICE

The Rome tramway system also has on order 30 buses of the type shown in an accompanying sketch. Fifteen of these buses will have seats for 28 passengers and standing room for 32. The other fifteen will be somewhat smaller, having seats for 22 passengers and standing room for 28.

These buses will be put to two uses. One will be as tramway feeders in sections of the city which do not yet have enough business for car lines. The other will be on lines where the car routing has had to be changed because of street congestion. Here buses will be used partly as substitutes for cars which have been rerouted through another street, but the length of run made by the buses will be much shorter than that of the former car line and no transfers will be given. Bus operation is regarded as considerably higher in cost per vehicle-mile



Indicator to tell passengers which car will next leave the terminal is operated electrically by the dispatcher

than car operation and the proportional difference is probably substantially greater than in the United States.

Up to the present no buses have been in operation by the Rome Tramways. There are in the city, however, about 24 storage-battery buses, operated by a private company, the Societa Anonima Transporti Ugolini. These buses have been in service about three years and are run on streets not occupied by car lines. These include the Corso Umberto I, the most fashionable shopping street in Rome. The routes over which these storage battery buses are used are fairly level, a rare condition in Rome.

SPACING AND NUMBER OF STOPS

The Rome Tramways has accomplished a great deal in the way of merchandising transportation. This work has been in charge of the traffic department. Part of its efforts has been given to increasing the schedule speed of cars by cutting out what the management believed to be unnecessary stops. This naturally met considerable opposition from interested parties anxious to have certain stops continued. But as a result of two years of effort 72 stops were discontinued and many others were more scientifically located. As a result the management believes that of its present 300-odd stopping places, more than 250 are rationally placed. The time of stops is shortened by the large number of island platforms for waiting passengers which have been installed in Rome.

ROUTES DESIGNATED BY NUMBERS

So much effort has been made in Europe toward identifying car routes by numbers and of advertising them by these numbers to the public that particulars will be given of the practice in Rome which has perhaps gone further in this direction than in most other European cities. In the first place, every car carries its route number and lettering showing the route termini conspicuously on head signs and also on signs at the sides of the car roof, as shown in the views of the car exteriors. The head signs are illuminated at night. Two disks inside the car with the route numbers in white on a black background are also being tried in some of the cars, to determine how useful this information will be.

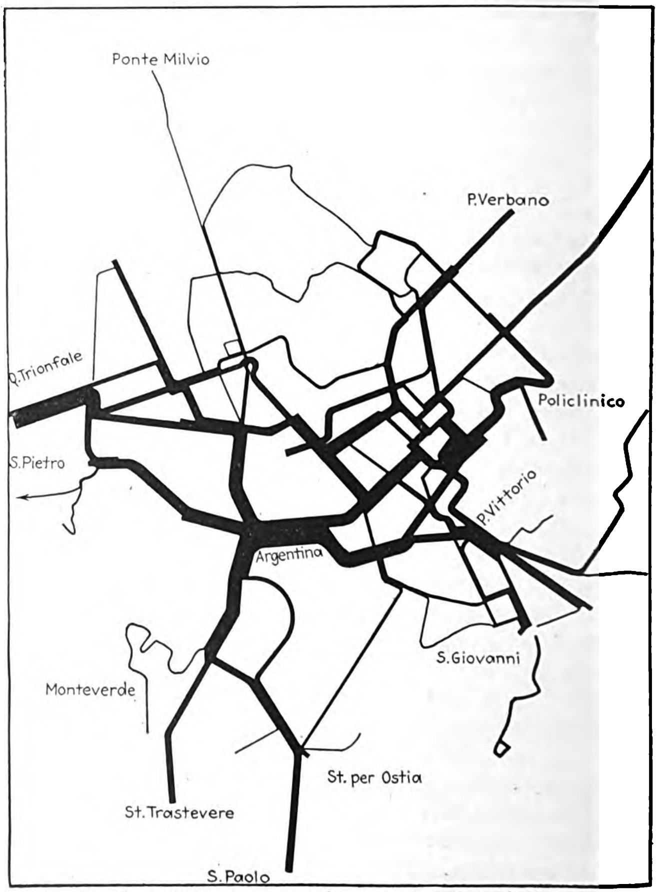
Each car carries in its right-hand front window and left-hand rear window a poster giving a list of the principal streets and the route termini, the latter being printed in red. These posters are duplicated, back to back, so that they can be read either from the inside or the outside of the car. A direction sign is carried in the left-hand window of the front vestibule with an arrow pointing to the terminus toward which the car is going. On the Piazza Colonna-Piazza S. Choce line, for example, the sign would show the arrow pointing to Piazza Colonna if the car was going in that direction and to the S. Choce terminal if the car was going in the reverse direction.

The numeral sign on a belt line car is surmounted by an arrow pointing to the right or left, depending on whether the car circles the city in a right-hand or left-hand direction. Not all of the plans outlined have been installed on every car, but all are on some cars for trial.

ADVERTISING THE ROUTES BY NUMBER

Distinguishing route signs would be of little value if the riding public were not taught to identify the various routes by these numbers. Passengers are helped to do this in several ways.

One is by the information published in route racks erected at stopping points. All routes stopping at any



Traffic flow diagram showing cars and trains for the maximum hour during January, 1927 particular point are listed by number in these racks and a short description is given opposite the number of each route. This system of marking car stops is a comparatively new one, and not all of the stops are so identified as yet.

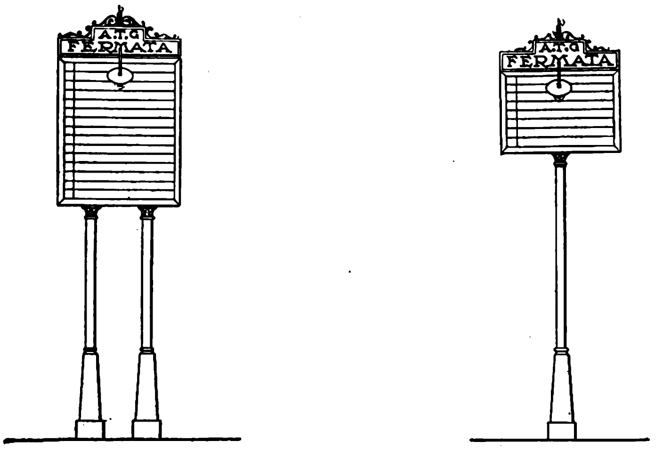
Besides these methods the plan customary throughout Italy is also followed. This is to hang from the span wire at a car stop a metal sign reading "Fermata." The letters are in black against a white background and are so large that the signs can be read for a considerable distance away. On the whole this plan seems more positive and satisfactory than that of placing a stripe or two stripes on an adjoining trolley pole. The stripe convention may signify a stop to a stranger or it may not. He is never quite sure.

Another method of familiarizing the riding public with the route numbers is by a "tramway guide." Such a handbook containing a list of the various routes and other helpful information such as length of route, headway, etc., is published and sold to the public for a small sum. This handbook contains two excellent maps of Rome on one side of the sheet in colors with the most important buildings and other points listed in red, while the map on the other side is printed in light gray ink, and over it is printed in red a chart of all the car routes with their distinguishing numbers.

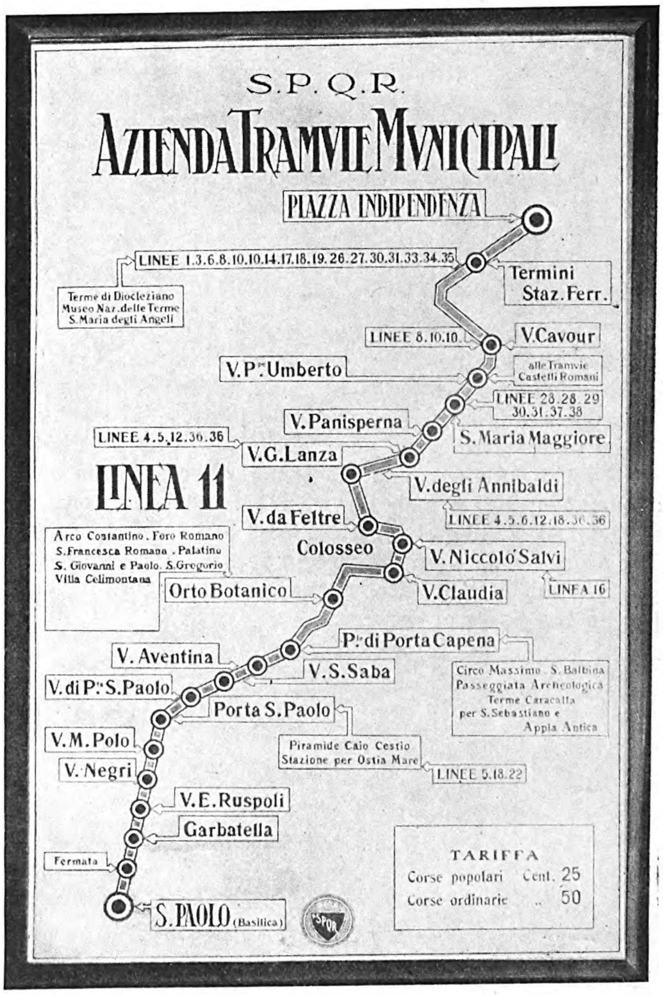
It would be difficult to overemphasize the value as a traffic promoter of these methods of advertising the different routes. The practice has become so accepted that residents of Rome come to know just what routes to take for desired journeys, and the tourist can quickly obtain and absorb the same information. In fact, the standard guide book tells the tourist which route by number he needs to take him to any desired point, and the larger guide books contain maps of the routes by number.

The practice described is not unique in Rome, as several cities in Italy have similar systems, though not worked out as completely.

A number of other transportation improvements were noted during a recent visit to the Rome system. One was a clever indicator to show to waiting patrons which car will be the next to leave a stub terminal. This point, Piazza San Silvestro, is at present the terminal of three lines, Nos. 8, 10 and 43. The dial shown in the view is marked with these three numbers and the hand is moved from one number to another electrically by a starter whose booth is located at the terminal. This hand shows the number of the route for which the next car will leave.


A.T.C.
FERMATA
A.T.C.
FERMATA

A feature of the merchandising of transportation in Rome is the method of marking stops and listing the routes passing that point. The rack is illuminated at night


S.P.Q.R.
AZIENDA TRAMVIE MVNICIPALI
PIAZZA INDIPENDENZA
LINEE 1.3.6.8.10.10.14.17.18.19.26.27.30.31.33.34.35
Terme di Diocleziano
Museo Naz. delle Terme
S. Maria degli Angeli
Termini
Staz. Ferr.
LINEE 8.10.10.
V. Cavour
V. P.ᵉ Umberto
alle Tramvie
Castelli Romani
LINEE 28.28.29
30.31.37.38
V. Panisperna
S. Maria Maggiore
LINEE 4.5.12.36.36
V. G. Lanza
LINEA 11
V. degli Annibaldi
V. da Feltre
LINEE 4.5.6.12.18.36.36
Colosseo
Arco Costantino. Foro Romano
S. Francesca Romana. Palatino
S. Giovanni e Paolo. S. Gregorio
Villa Celimontana
V. Niccolò Salvi
Orto Botanico
V. Claudia
LINEA 16
P.ᵗ di Porta Capena
V. Aventina
V. S. Saba
Circo Massimo. S. Balbina
Passeggiata Archeologica
Terme Caracalla
per S. Sebastiano e
Appia Antica
V. di P.ᵗ S. Paolo
Porta S. Paolo
V. M. Polo
Piramide Caio Cestio
Stazione per Ostia Mare
V. Negri
LINEE 5.18.22
V. E. Ruspoli
Garbatella
Fermata
TARIFFA
Corse popolari Cent. 25
Corse ordinarie .. 50
S. PAOLO (Basilica)
SPQR

A chart of this kind has been prepared for each route showing all stopping points and connections with other lines

The number of electrically operated track switches now in Rome is being constantly increased, in spite of the comparatively low cost of labor in Italy. On Jan. 1, 1926, there were 26 such switches on the system. Light signals to warn other vehicles of an approaching electric car have been installed at a number of curves or other points where the view ahead is obscured by intervening buildings. These signals are not greatly different in principle from the automatic type of warning signal used at grade crossings of steam railroads in America and carry the words on an illuminated dial: "Attenti al Tram," or "look out for the street car." They are unusual because in Rome they are used exclusively in city tramway service at sharp corners.

Several covered waiting stations have been erected. A number of headway recorders have been installed at different strategic points.

ONE-MAN OPERATION BEING TRIED

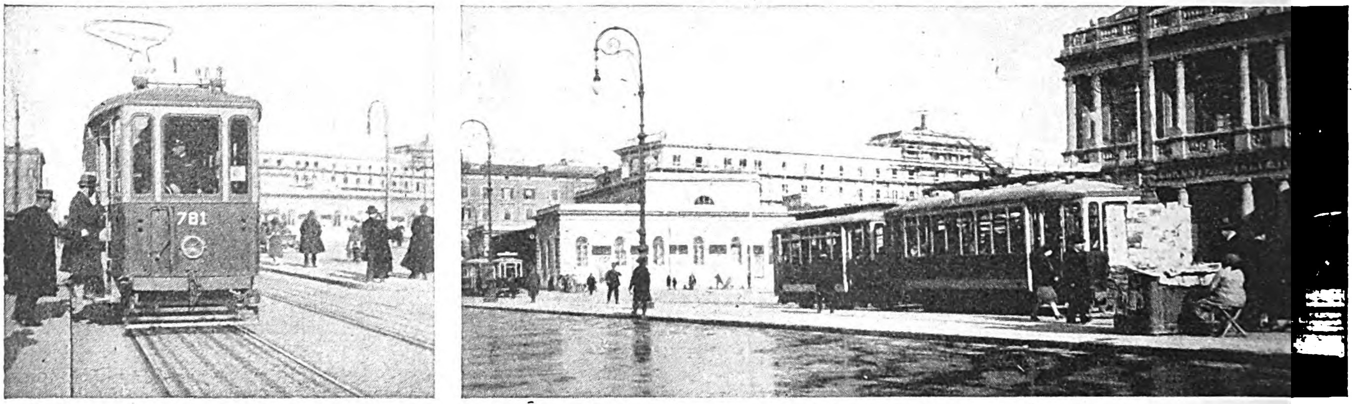
As yet only a belt line in the suburb of Monte Sacro uses one-man operation. On all other lines a conductor is used on each car, and this means of course two conductors on a two-car train. In retaining two-man operation Rome does not differ from most other electric railway systems in Europe. Among the reasons which have impelled Rome to continue this practice the following may be mentioned.

TABLE II—YEARLY WAGES PAID BY THE ROME TRAMWAYS

Class of Employee	Number Employed on Dec. 31, 1925	Basic Yearly Wage Lire	Basic Yearly Wage Dollars	Increase in Yearly Wage Made Every Two Years (Limited to Five Periods or Total of Nineteen Years Lire	Increase in Yearly Wage Made Every Two Years (Limited to Five Periods or Total of Nineteen Years Dollars
Inspectors, instructors, etc.	90	12,500	567	380	17
Motormen	737	19,800	491	320	14
Conductors	1,032	9,300	423	280	13
Carhouse helpers, track men, etc.	115	7,900	359	250	11

Note:—On the basis of 22 lire to the dollar.

1. Labor cost is much less than in the United States so that the saving from one-man operation is not so great. The wages paid the four principal classes of transportation employees in Rome is given in Table II. These figures are given on a yearly basis, as that is the basis of the five-year contract made between the management and the men on Dec. 15, 1923, to continue through 1928. The hours per week are 52, and in addition to the wages paid a certain part of their uniforms is given to the men without charge, the amount depending on the years of service.



Island platforms are used extensively in Rome. The one shown here is located in front of a principal railroad station

2. A second reason given for the continuance of two-man operation is the low speed of the cars and the non-use of platform gates. The Rome Tramways has notices requesting passengers to board cars by the rear platforms and leave by the front platforms, as well as notices forbidding passengers to board or leave cars while in motion. Both rules are disregarded, especially that requiring cars to be boarded by the rear platform. This makes hand fare collection almost obligatory.

3. A final reason for the retention of the conductor is the system of fare collection employed. This is the common European plan of issuing fare receipts torn serially from a pad. However, as most of the Rome system is now on a flat fare basis of 50 centessimi on week days and 60 centessimi on Sundays, it would seem that prepayment could be used if this were the only objection to it. That this is not impossible is shown by the fact that the Rome management is now considering the use of portable fare registers instead of the pad system.

The disadvantages of the latter are great. Its use means not only that the car is littered with used receipts discarded by passengers, but the plan is expensive in stationary and in the employment of inspectors who board the cars to see if all passengers have paid their fares. Also, it is more subject to abuse by both passengers and conductors than a fare box or a register with hand collection.

Before starting its single one-man car line the management issued an extended schedule of instructions to passengers. Among them is noted the rule that passengers are requested to offer to the one-man operator the correct fare when boarding, and that the operator has the right to refuse admittance to the car to all persons who do not present the exact fare.

SYSTEM IS OPERATED BY MUNICIPALITY

The present owner and operator of the Rome Tramways system (with the exception of one line) is the city of Rome, the management being intrusted to a board known as Azienda delle Tramvie del Governorato di Roma. Municipal operation was begun in 1911, when the city started service on several lines, in addition to those which were then being operated by a private company—Societa Romana Tramways-Omnibus. Gradually the lines of this company (with the exception of No. 16) were absorbed by the municipality, the greater part being taken over in 1919.

The single line not yet taken over (No. 16) is an important route. In addition the company owns a street railway tunnel under the Quirinal Hill, which is used by line 16 and also by a number of the municipal routes. The franchise for this tunnel and for line 16 does not expire until 1940. It is quite probable that the city will acquire both tunnel and line before that time by purchase.

RAPID TRANSIT NEEDED

An accompanying traffic flow diagram shows the need of some relief to the tramway system in the way of rapid transit. The through arteries are few and are now considerably congested. They will become more so as motor car traffic in the streets increases, as it is certain to do. Some relief could be gained by a tunnel under the Capitoline Hill, but eventually Rome will have to have some sort of rapid transit system like other large national capitals. This condition is realized by the city authorities and a commission has been appointed to consider plans. At present a north-and-south line and an east-and-west line are proposed, and shafts are being sunk at different points to determine the nature of the subsoil. Trains of five cars are being considered for the first installation. The project would be financed by the city with some assistance from the national government.

Momentary Stresses Developed While Bucking Railway Motors

A maximum torque fourteen times the full load value may occur under certain conditions. High current peaks may result in cracked shafts and pinions or other mechanical damage to a motor

By L. M. Aspinwall
Railway Equipment Engineer
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

MAXIMUM sustained stresses in electric railway motor armatures, shafts and gears are limited by the slipping point of the wheels on the rail, but, unfortunately, the momentary stresses are not so safeguarded. The force required to accelerate or retard any given mass is directly proportional to the rate of change in velocity. Therefore, a sufficiently rapid change in the velocity of the rotating parts will cause the corresponding forces to assume tremendous magnitude. There is, of course, nothing new in this statement of a simple fundamental law of physics, but we wish to emphasize it, as the following discussion deals with momentary stresses produced by sudden changes in velocity.

Theoretically, the torque which can be developed by a series type railway motor is limited only by the current which can be passed through the motor. The current, in turn, is limited by the impressed voltage, time of application, motor resistance, counter emf., inductive emf., flash-over point and safety cutout devices. It is perfectly possible, under certain conditions in actual practice, for the current to reach such momentary values as will produce stresses far in excess of the slipping point of the wheels.

In the following discussion particular consideration is given to the conditions produced when motors are "bucked" at various car speeds and the possible stresses to which axles and gears may be subjected under these conditions. In general, those familiar with railway work understand what is meant by bucking the motors, but as this term is sometimes erroneously used a few words of explanation here will probably not be amiss.

Assuming a car to be running away with power off the line or the circuit breaker open, bucking is accomplished on a four-motor equipment by merely throwing the reverser, and on a two-motor equipment by reversing and moving the controller handle up to any one of the parallel notches. Under these conditions the motors immediately pick up as generators, the two motors which are in parallel generating voltages which are in opposition, and as the characteristics of the two machines are never exactly matched, one quickly overcomes the voltage of the other and reverses its field. The two machines are then generating in series through a circuit consisting of the resistance of their fields, armatures and the connecting wiring.

Bucking should only be used as a last resort in cases of emergency where all other means of stopping the car have failed. If the car speed is sufficiently high the current rises quickly to a point where one or both pairs of wheels slip. If both pairs of wheels slip the current drops quickly to a value where the wheels again take hold. The current then rises until the wheels again slip, and this cycle is repeated with great rapidity, producing a series of jerks, which action is responsible for the origin of the term bucking.

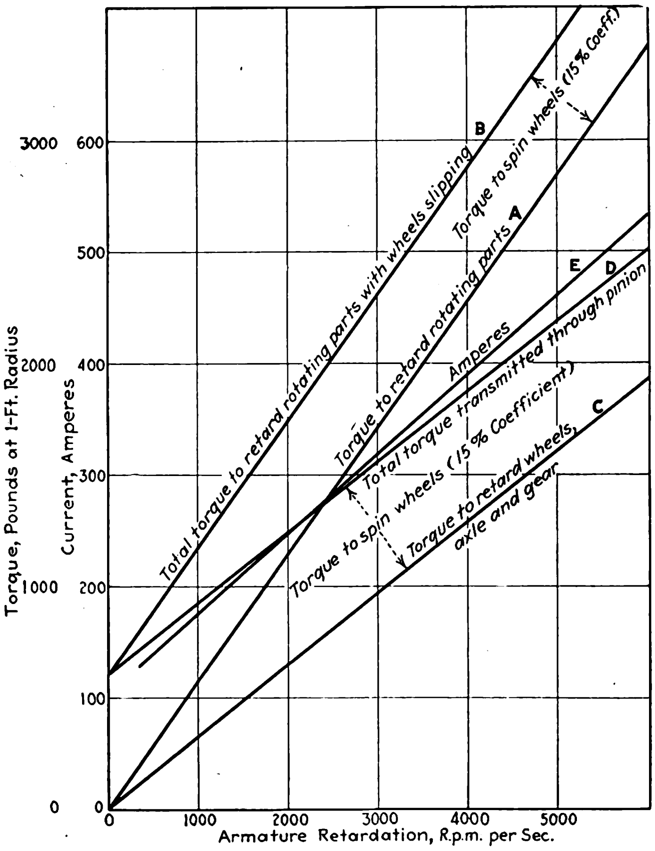


Fig. 1—Torque and current relations in retardation of armature, wheels and axle

Curves are for a quadruple equipment of Westinghouse 532-B motors with 17:67 gear ratio and 33-in. wheels. The load is 5.75 tons per motor and the adhesion 15 per cent with wheels slipping.

Frequently only one pair of wheels slips and this pair is locked or driven in the reverse direction by the current generated from the motor, which is still rotating in the same direction as the car motion.

In some cases cars have been wired with what is known as a loop circuit in order that this emergency

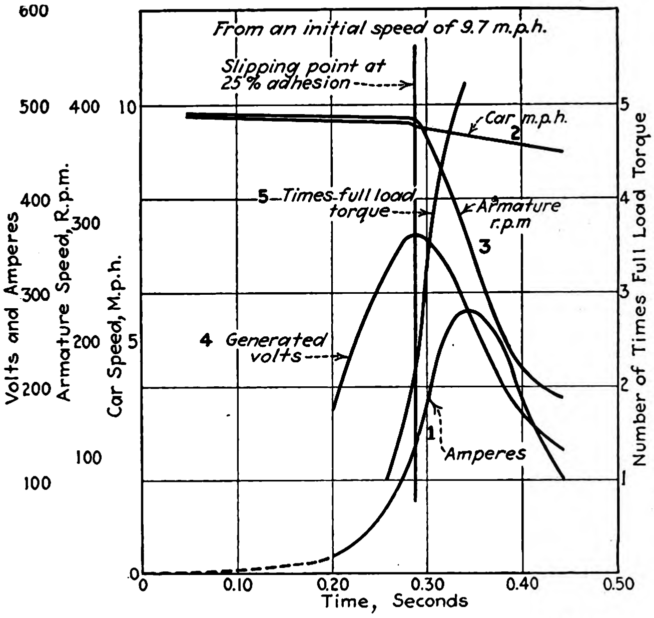


Fig. 2—Transient conditions during period of bucking for motor with characteristics given in Fig. 1

The total resistance of the loop circuit is 0.9375 ohm. The motors were bucked from an initial speed of 9.7 m.p.h., giving the ampere curve 1 as recorded in an oscillogram. The other curves were calculated from curve 1 and available data.

feature of bucking could be used with less erratic results. The loop circuit consists merely of a connection which is established across the terminals of the motors during bucking, so that the two motors generate in parallel through this path.

The Westinghouse 532-B motor was selected for the purpose of this analyzation for the reason that oscillograms were available which were taken on this motor under bucking conditions, with loop connections, and formed a basis for calculations and check.

The first step in this study was to calculate the forces necessary to accelerate, or retard, the component rotating parts, such as armature, wheels, gears and axle, assuming a 17:67 gear ratio and 33-in. wheels. The result of these calculations has been plotted in Fig. 1. Curve *A* on this graph shows the total torque required at the armature to retard the armature, plus the wheels, axle and gear at various rates expressed in armature r.p.m. Curve *C* shows the torque necessary to retard the wheels, axle and gear only and is, in general, the curve in which we are particularly interested, as this curve, plus the torque necessary to slip the wheels, shows the total torque transmitted through the armature shaft and pinion.

In the case under consideration a weight of 11,500 lb. was assumed on each axle, and to spin the wheels at 15 per cent adhesion required 1,720 lb. tractive effort, or a torque of approximately 600 lb. at 1 ft. radius on the armature shaft.

Curve *B* is plotted 600 lb. above curve *A* and shows, therefore, the total torque required to spin the wheels at 15 per cent adhesion and to retard the total rotating parts at various rates. The approximate current necessary to produce this torque is shown by curve *E*, the values for which, above 150 amp., were obtained by extrapolating the normal torque curve of the 532-B motor.

It should be noted particularly that with a high current, say 500 amp., the torque necessary to spin the wheels, which is indicated by the vertical distance between curves *A* and *B*, is a small portion of that required to retard the rotating parts and is not, therefore, a limiting factor.

Curve *D* shows the torque necessary to spin the wheels with 15 per cent adhesion and to retard the wheels, axle and gear at various speeds.

From the foregoing it will be understood that in Fig. 1, for a given current through the motor, *B* shows the total torque which must be carried by the armature coils and teeth and *D* shows the total torque which must be transmitted through the armature shaft and pinion.

Bearing in mind these relations between the torque necessary to spin the wheels and the torque to retard the rotating parts, let us pass to a consideration of the transient values which occur when the motors are shorted on a loop circuit and allowed to build up as generators on a car running at a given initial speed.

The instant the motor circuit is closed the current starts to build up at a rate which is a function of the speed, the field strength and the impedance of the circuit. When the current has reached a value which gives a tractive effort equal to the slipping point of the wheels, say 25 per cent, the wheels start to spin on the rails at a speed less than the corresponding car speed and the coefficient of adhesion drops to say 15 per cent. From this point on the only force which can act to retard the mass of the car is equal to 15 per cent of the weight on the wheels plus the windage, but the force which can act to retard the rotating parts is limited only by the current through the motors. The current through the motors continues to rise after the slipping point is reached and the armature continues to slow down at an increasing rate until the maximum current point is reached.

After passing the maximum point the current decreases until the tractive effort falls to a value which is just sufficient to balance the coefficient of adhesion,

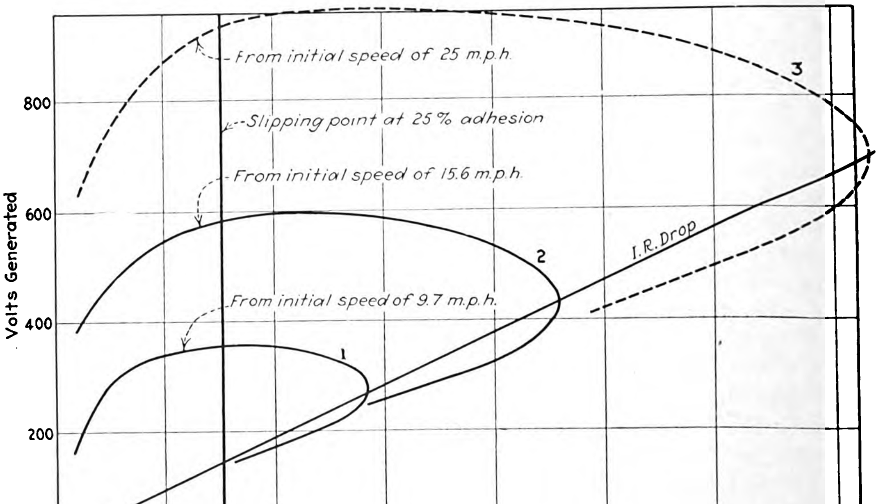


Fig. 3—Characteristic motor performance when bucking on a loop circuit

Curves 1 and 2 were determined from oscillograms taken on the equipment with characteristics given in Fig. 1. Curve 3 was calculated from Curves 1 and 2.

at which point the wheels may again grip and the cycle be repeated starting from a lower speed.

The rate at which the armature is retarded at any instant depends on the current, and the actual speed reduction depends on the duration of time for that current value, therefore it is evident that in order to figure the transient values we must determine the rate at which the current builds up.

From one of the oscillograms taken on type 532-B motors under bucking conditions, as previously mentioned, we are able to determine the current-time values on a test starting with an initial car speed of 9.7 m.p.h.

With this data we have been able to calculate the results shown in Fig. 2. The ampere-time curve (1) on this sheet is plotted directly from the oscillograph readings. The car speed curve (2) and the armature revolutions per minute (3) have been calculated from the ampere-time curve in the same manner as that employed in laying out an acceleration curve, starting with the known initial car speed.

For example, different current values were assumed and the time interval between each of these current increments was noted from the oscillogram, and the corresponding tractive effort from the motor characteristic curve. From the above data the reduction in car speed between current increments was figured up to the point where the tractive effort reached the slipping point of the wheels at 25 per cent adhesion.

After passing the slipping point of the wheels, Fig. 1 was used to determine the rate of retardation of the armature and other rotating parts for each current increment and the decreased speed of the armature was calculated for each point.

From the point where the wheels start to slip the speed of the car and the speed of the armature bear no relation whatever to each other, as the car continues to be retarded only under the influence of the spinning adhesion and windage, whereas the armature is being retarded at a constantly increasing rate as the current continues to rise. After the armature speed curve (3) had been figured out, the curve for generated voltage (4) was deduced from the known saturation curve of the motor.

Curve 5 has been added to this sheet to show the number of times that the torque exerted for the different current values exceeds the normal full load motor torque. It will be noted that the maximum value in this particular case is 5.2 times full load torque.

On curve 1, Fig 3, the generated voltage has been plotted against the current for the same values as shown on Fig. 2. Curve 2 on this same sheet was calculated from another oscillograph curve in the same manner as curve 1. This second curve started, however, from an initial speed of 15.6 m.p.h. Curve 3 was constructed from an initial speed of 25 m.p.h. on the basis of the data obtained in curves 1 and 2.

The total resistance of the loop circuit, including the motor and wiring, was 0.9375 ohms and the curve marked *IR* is this value multiplied by the current. The vertical distance from the *IR* curve to any of the three curves represents the inductive volts. The maximum current value for each curve naturally occurs at the point where the curve crosses the *IR* curve, for at that instant there is no change in the current and consequently no induced voltage, so that all of the generated voltage is taken up in the *IR* drop. An inspection of curves 1, 2 and 3 shows that they are of the same form, but of a magnitude increasing in practically direct proportion to the initial car speed at which "bucking" is started.

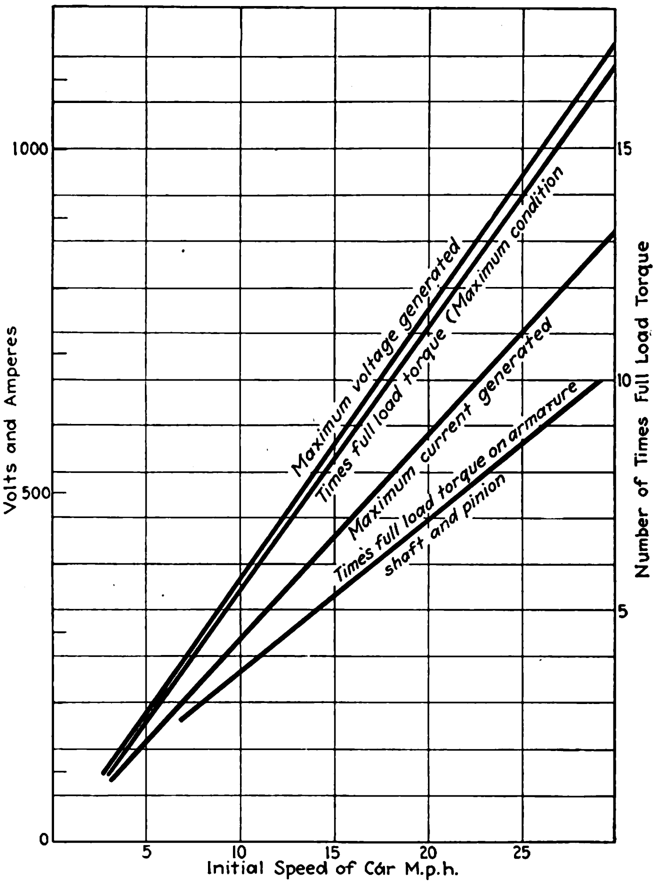


Fig. 4—Maximum values of voltage, current and torque generated while bucking the motor with characteristics shown in other figures from various initial car speeds

From the above it is apparent that it is only necessary to determine the form of the current-time curve for a given equipment for one given speed and the performance for any other speed can be readily deduced. It will be noted that in this particular case the maximum voltage is generated at a short interval after the wheels start to slip and that the maximum current occurs a little later when the generated voltage has fallen to approximately 72 per cent of its maximum value.

In Fig. 4 are shown in simple straight line functions the final results obtained from curves previously mentioned. From this curve it is possible to see at a glance the maximum voltage, current and torque which can be generated when bucking motors on this particular equipment at various initial speeds. For instance, if the motors are bucked at a speed of 25 m.p.h. the maximum voltage generated will be approximately 950 volts, the maximum current 730 amp. and the maximum torque fourteen times that of full load.

The values on this curve are the maximum with the conditions as assumed and, of course, under certain operating conditions the values may not be as great. On the other hand, it must be remembered that with a greater weight per axle and a higher coefficient of adhesion the conditions will be considerably worse.

It might be argued that these values will never be reached in practice due to the fact that the motors would flash over. No doubt flashovers would limit the maximums to a certain extent, but we do not have any definite data as to just what these limits would be. It should be remembered that the fact that the maximum voltage and maximum current are not coincident will have some influence on this question. Tests have been made as to the flashing points on different motors with various speeds and voltages, with moderate currents, but the data are rather meager as to the "flashover" point with tremendously oversaturated fields.

We do know that on tests made on type 532-B motors in Baltimore in 1920 currents in the neighborhood of 475 amp. per motor were obtained without flashovers, and the writer has seen the potential go up to approximately 1,000 volts on other motors when used for braking, also without apparent flashover.

In 1914 a test was made with a three-car multiple-unit train, bucking the motors at a speed of 40 m.p.h. The wheels on the front car revolved backward through the stop, while those on the rear cars alternately rolled and slid. When the train came to rest every motor was smoking and there were numerous flat spots on the wheels. No records were made of the current values in this test, but no doubt they were terrific and the stresses correspondingly large.

This discussion has considered particularly the effect of bucking motors, but it must be remembered that these high current peaks may be produced in other ways. It is quite probable that cracks in shafts or pinions may be started in some cases by these tremendous momentary stresses and that later on they develop into inexplicable failures under apparently normal service conditions.

Joliet Worm-Drive Trucks Impress Railway Men During Test

Experimental trucks mounted under temporary body for demonstration run. Fixed bolster construction proves successful

JOLIET'S new worm-drive street car trucks, developed by J. R. Blackhall, vice-president of the Chicago & Joliet Electric Railway, in collaboration with the Timken-Detroit Axle Company, Westinghouse Electric & Manufacturing Company and other equipment makers, were given an official test run under varying conditions of track between Joliet and Lockport, Ill., on May 13. In the estimation of more than 50 street railway officials, electrical engineers and manufacturers' representatives who attended, the demonstration was comprehensive and thoroughly satisfactory.

Aside from a slight ring or hum to the wheels when operating at high speed, a condition which Mr. Blackhall contends exists entirely in the wheels and not in the gears, the new trucks fully measured up to expectations. The Timken company is now co-operating with Mr. Blackhall to still further improve the operation. A detailed description of the truck, which represents the most important major change in truck design in many years, appeared in the April 2 issue of ELECTRIC RAILWAY JOURNAL.

To provide some degree of contrast for comparison during the demonstration runs, two regular city-type street cars were used on the 12-mile test trip, one mounted on the new worm-gear trucks, the other on trucks of the conventional type. On the outbound trip, the entire group of 60 visitors were loaded into the car equipped with the new trucks. On the return, half of the passengers were asked to ride the old-style car so that they might notice the difference in riding qualities.

The automotive trucks, developing a maximum speed during the trip of 34 m.p.h., negotiated sharp curves, 5-deg. grades, and special trackwork with the utmost ease and smoothness. As the car was put through its paces the visitors were greatly impressed with the comparatively quiet operation, simple method of control, and unusually comfortable riding qualities of the trucks.

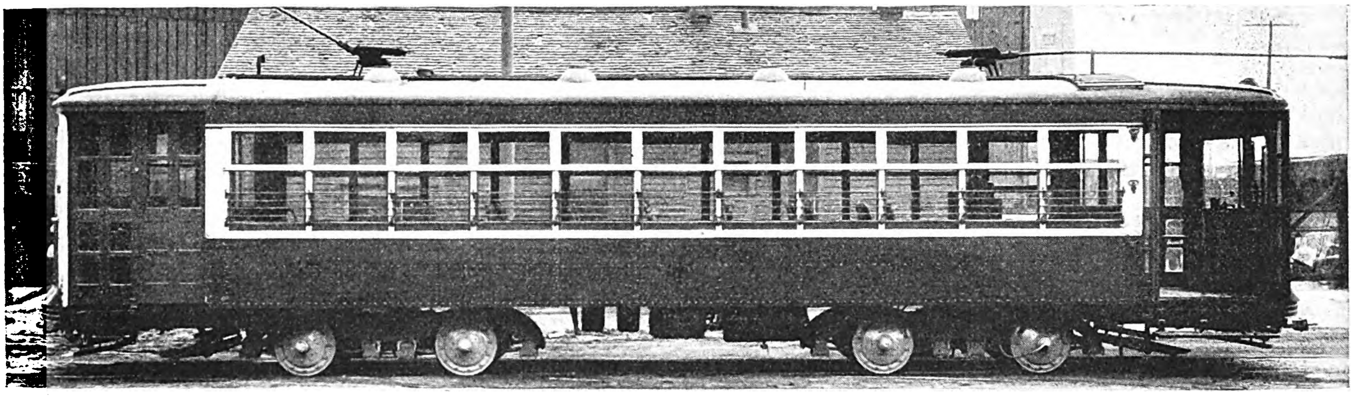
At one stage of the trip the passengers were requested to leave both cars so that they might closely observe the behavior of the new-type trucks in crossing a double-track steam railroad line. Although both cars took the crossover at approximately the same rate of speed, it was noticed that there was considerable jolting and rattle as the ordinary standard trucks passed over the intersection. On the other hand, the new trucks sped over the crossing with an almost inaudible click.

In rounding curves at high speed, there was a significant absence in the test car of the customary shrieking of wheels and swaying of the body. This Mr. Blackhall attributed to the differential drive in the axles, which, as in the case of automotive vehicles, permits the outer wheel to revolve faster than the inner one. The action of the trucks on curves and special trackwork, even at full speed, was steady, smooth and quiet.

Instead of a floating bolster such as employed on the worm-drive car recently tested at Springfield, Mass., the Joliet trucks have a stationary bolster. Riding action depends upon the long half elliptic side springs mounted in Masury rubber shock absorbers on the side frame, instead of shackles. Several of those present were impressed by the success of this fixed bolster construction and considered that it actually improved the riding qualities of the car.

Some idea of the relative performance of the old and new type of trucks may be gathered from the following table, which was compiled by Mr. Blackhall and handed to his guests at the conclusion of the test:

	Car With Automotive Trucks	Car With Ordinary Trucks
Total miles	12.0	12.0
Total kilowatt-hours	23.0	23.0
Total passengers	58.0	None
Estimated passenger weight	5.07 tons	
Estimated car weight	16.00 tons	18 tons
Total estimated weight	21.07 tons	18 tons
Kilowatt-hours per car-mile	1.92	1.92
Watts per ton-mile	90.8	106.5
Saving in watts per ton-mile, per cent	14.8	
Kilowatt-hours outbound	15.2	11.5
Kilowatt-hours inbound	7.8	11.5
Kilowatt-hours per car-mile outbound	2.53	1.92
Kilowatt-hours per car-mile inbound	1.30	1.92



Worm-drive trucks under regular city car body

In judging the results of the demonstration, visitors were asked to bear in mind the fact that the trucks are intended for use with a light-weight city-type car, built of duraluminum (17 SD aluminum alloy) and representing an entirely new departure in construction and design. While in the body used on the demonstration run no particular thought was given to such matters, the new car will be provided with rubber-tile flooring and other devices to deaden noise. All materials for the car have been ordered, and delivery is expected from the manufacturer, the Cummings Car & Coach Company, of Paris, Ill., some time in August. The car will have an over-all length of 41 ft. 3 in. and will accommodate 52 seated passengers. Its weight is estimated to be only about 22,000 lb. complete, as compared with the 38,500-lb. cars now operated on the Joliet line.

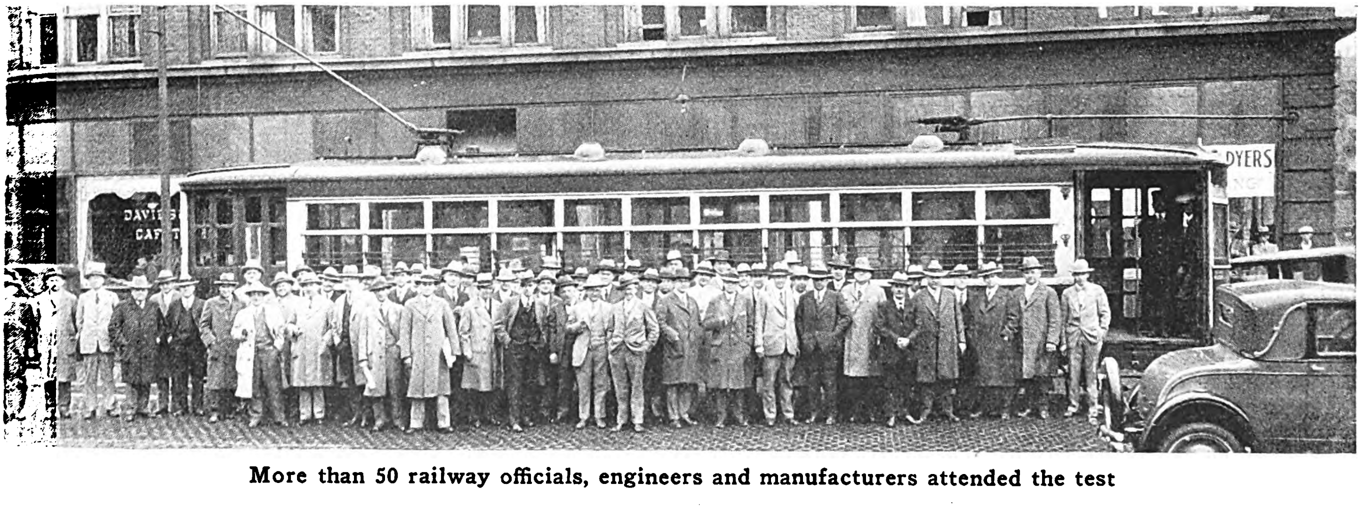
The Westinghouse automotive-type diaphragm braking system used with the new trucks was examined with particular interest by the inspection party. Much favorable comment was heard on the simplified design and the noticeable absence of rattling, due to complicated brake rigging. A small hand brake for use in case of air failure is the only conventional rigging in the entire truck frame. With more than 80 sq.in. of braking area per wheel, as compared with a possible 40 in. on ordinary trucks, the equipment demonstrated extraordinary capacity for quick, smooth and quiet stops. In fact, it was felt that the brake rigging as now designed provides greater retarding power than is necessary.

By virtue of the increased speed, quicker acceleration and retardation of this type of truck, Mr. Blackhall hopes to be able to decrease the number of cars needed to handle present loads on his system by 20 per cent. By mounting the lighter-weight high-speed Westinghouse motors on spring-suspended members of the truck frame rather than directly on the axles, it is his belief that the wear and tear on the rails, as well as on the cars, will be considerably reduced. In addition he feels that track construction costs will be lowered; because lighter-weight rails may be used. It is estimated by the manufacturers that between 750,000 and 1,000,000 car-miles will be obtained from the worm-gear drive.

The new trucks were placed in regular operation in city service immediately following the test. They are an outgrowth of more than two years of study to develop a type of equipment that will popularize street car riding. Through the development of this improved truck, Mr. Blackhall evidences his sincerity in consistently advocating for many years the application of scientific research to street car construction and design.

The following men were present during the demonstration run:

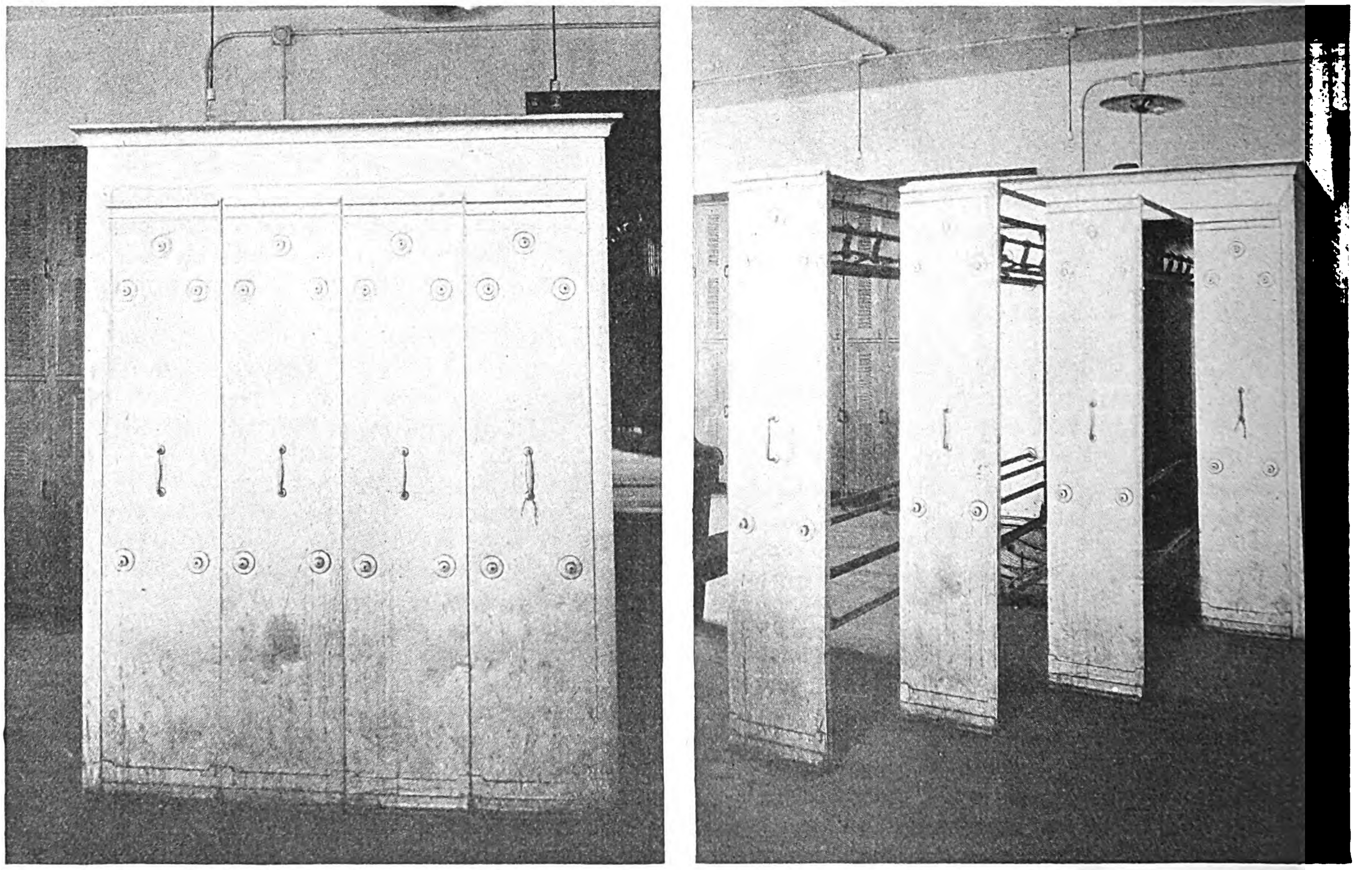
G. W. Welsh, T. H. Shaughnessy, Michael O'Brien, F. J. O'Brien, R. M. Stewart, R. Doyle, H. A. Barbero, G. F. Dougall, J. B. Barton, H. H. Lytle, Clarence Brown, George A. Bendel, B. E. Keifer, Wm. C. Naegel, H. C. Maddux, Harold E. Larsen, W. G. Norris, George E. Fox, N. R. Brownyer, W. L. Love, Charles F. Dahlquist, Lewis M. Williams, C. W. Gifford, F. S. Thomas, H. H. Adams, C. W. Young, S. M. Nahikian, D. C. Evans, C. L. Van Auken, R. S. Bull, R. H. Parker, Fred P. Biggs, Fred A. Morgan, H. H. Chapman, John S. Y. Fralich, L. C. Datz, C. W. Young, Wm. Bonn, George Watts, A. P. Jenks, Bert Collett, W. C. Wheeler, D. S. Owens, R. Sonnalind, J. D. Roberts, M. Murphy, J. R. Blackhall, George A. LeRiche, W. H. Heun, A. W. Baumgarten, C. E. Rogers, S. L. Vaughn, Mr. Nielson.



More than 50 railway officials, engineers and manufacturers attended the test

Laundry Drier for Wet Uniforms

EIGHT of the division headquarters of the Brooklyn City Railroad are equipped with clothes driers so that wet uniforms of transportation men can be dried quickly, if necessary. This equipment was installed several years ago and has proved very useful, particularly for car crews employed on open cars in summer, of which Brooklyn still operates a considerable number. With sudden rainstorms the crews are apt often to get thoroughly drenched. With the growing use on this property of closed equipment throughout the year and the consequent abandonment of open cars there is not so much call for this drying equipment. However, it is also used by inspectors and other transportation employees who are exposed to the weather and so is still kept in the carhouse. Similar equipment will be of interest to other companies where operating conditions make the drying of uniforms at carhouses a matter of considerable convenience.



With this apparatus, used on the Brooklyn City Railroad, wet uniforms can be dried quickly. The view at the left shows the drier closed, that at the right shows the drier with three of the four sections open

The drier is one which was really built for use in laundries and consists of four movable sections with frames for supporting clothes. The ends of these sections are mounted on rollers so that they can be moved in and out easily. Each section is equipped with several rows of horizontal rods, the upper rods carrying clothes hangers, on which the uniforms can be placed, and the lower rod wire netting for supporting shoes and underclothing. When closed, the drier occupies a floor space of 6 ft. x 14 ft.

The rear of the drier is equipped with a fan and ¼-hp. motor. This fan draws in air through louvers near the bottom of the drier and blows across an electric heater, after which it passes around the wet clothing. The air escapes through a ventilator at the top of the drier. A considerable number of uniforms can be dried quickly in this device in a very short time.

Consolidation of Dispatching Towers Boon to North Shore Service

WITH the recent completion of a new dispatcher's office and tower at the North Chicago Junction station, dispatching points on the Chicago, North Shore & Milwaukee Railroad systems formerly located at Harrison Street, Milwaukee, and at Highwood, Ill., have been centralized in the new unified dispatch tower. The building, which houses the dispatchers who control all main line train movements between Milwaukee and Howard Street, Chicago, is built at the south end of the station platform at North Chicago Junction. This is a strategic position, from a dispatching standpoint, as the Waukegan line, the Old Shore line, the Skokie Valley route, as well as the main line to Milwaukee, all converge at this point. The relocation tends to facilitate train operation, inasmuch as the men who route the trains are posted at the most important junction of the system.

J. W. Simmons, superintendent of transportation, states that through the use of the tower greater coordination is possible between the new train schedule recently put into effect and the facilities afforded through unified control.

The Readers' Forum

Intent of Chicago Traffic Code Explained

CHICAGO SURFACE LINES

CHICAGO, May 18, 1927.

To the Editor:

In the ELECTRIC RAILWAY JOURNAL of May 14 there is an editorial that misstates the intent of the new traffic code that has been adopted in Chicago.

The code as adopted at present is essentially the same as is printed in the report of the Metropolitan Street Traffic Survey, prepared under the direction of the street traffic committee of the Association of Commerce by Miller McClintock, except for three items which were left for further consideration by the Council after the Council could be reorganized following the election. These items covering parking, turning in the middle of the block and the creation of loading zones have not yet been fully decided. Otherwise the code was adopted substantially as presented in the report from the street traffic committee.

The code now reads as follows:

SECTION 11. *Pedestrian's Limited Right of Use of Roadway.*—At no place shall a pedestrian cross any roadway other than by the most direct route to the opposite curbing, and when crossing at any place other than a crosswalk shall yield the right of way to all vehicles upon the roadway.

SECTION 12. *Pedestrians to Obey Signals.*—At intersections where traffic is directed by a police officer or by a signal commonly known as a stop and go signal, it shall be unlawful for any pedestrian to cross the roadway other than with released traffic, if such crossing interferes with the movement of traffic.

From these sections you will note that there is no intent to eliminate crossing at points other than at intersections, nor is complete regulation of pedestrians by signals intended.

Forcing pedestrians to move only with signals has not been considered by the committee to be desirable, necessary or in the best interests of the traffic movements on the street. Such regulation may be applicable some time, some where, but there is much valid argument against such regulation in business areas of large cities. In fact, due consideration resulted in the opinion that there is an overwhelming proportion of the arguments in favor of the interpretation as written in the Chicago code as above quoted.

I hope you will find some adequate way of correcting the impression that Chicago did adopt what is usually termed "pedestrian control."

E. J. MCILRAITH,
Staff Engineer.

Master Mechanics Are Working for Progress

CHICAGO, SOUTH BEND & NORTHERN INDIANA RAILWAY COMPANY

SOUTH BEND, IND., May 23, 1927.

To the Editor:

On behalf of the Central Electric Railway Association Master Mechanics, I wish to thank you for the fine articles which appeared in the May 21 issue of EECTRIC RAILWAY JOURNAL covering the meeting in Pittsburgh on May 11 and 12.

It is through the fine co-operation that you are giving the industry through the pages of ELECTRIC RAILWAY JOURNAL that the industry is finding itself and is starting to forge ahead. I am sure that from these articles every electric railway operating official will fully realize that the C.E.R.A. Master Mechanics are not holding meetings of play, but are actually trying to accomplish something for the industry as a whole.

GEORGE R. GREEN,
President C.E.R.M.M.A.

Hazards of Street Work Increasing

DENVER TRAMWAY CORPORATION

DENVER, COL., March 26, 1927.

To the Editor:

Your editorial on page 564 of the Oct. 2, 1926, issue of ELECTRIC RAILWAY JOURNAL on the increasing hazard that attaches to street work impressed me as timely, and ever since I have been on the watch for something more on the subject.

I am aware that the subject has been touched on before this, also handled not so long ago in the A.E.R.A. questionnaire, but to my mind it has only been scratched.

It was again brought to my mind very forcibly through the death of one of our track foremen on the night of March 16 at 9 o'clock, while engaged with a helper in cleaning out and salting switches, curves, etc., just after a snowstorm. The street intersection was well lighted, also a full moon helped to indicate objects ahead.

In view of the seriousness of the subject and the increasing number of injuries and fatalities I for one would be very much pleased to see this matter kept alive through the columns of the JOURNAL in some way until we can at least learn what method or practice has been found to give the best protection to the men who have to make repairs and do other routine work in the streets in connection with ordinary track maintenance, especially between sundown and daylight.

In checking back over the records I find that between February, 1923, and March 16, 1927, inclusive, our experience has been seventeen men seriously injured, two of whom died, as a result of being struck by automobiles while engaged in trackwork in the street.

W. G. MATTHEWS,
Superintendent Way and Structures.

Improved Employment Conditions in St. Louis

DATA comparing the wages paid by the United Railways, St. Louis, Mo., in different years in their relationship with changes in personnel or annual turnover have been prepared by Richard J. Lockwood, assistant manager. In 1913 the carmen averaged 25 cents an hour and the turnover was 34 per cent. Now the average wage is 64 cents an hour and the annual turnover only 13 per cent. More stable employment conditions also prevail in the mechanical departments, where, with 1,000 men employed, not one was hired or discharged from April to July, 1926.

This more stable condition in the company's personnel is believed to have had a marked effect on the number of accidents. During the year 1926 11 per cent of all traffic accidents on the car system involved men who had been employed only one year or less, although these men comprised only 9 per cent of the total number of trainmen employed.

Maintenance Notes

Crane on Flat Car Solves Pole-Setting Problem

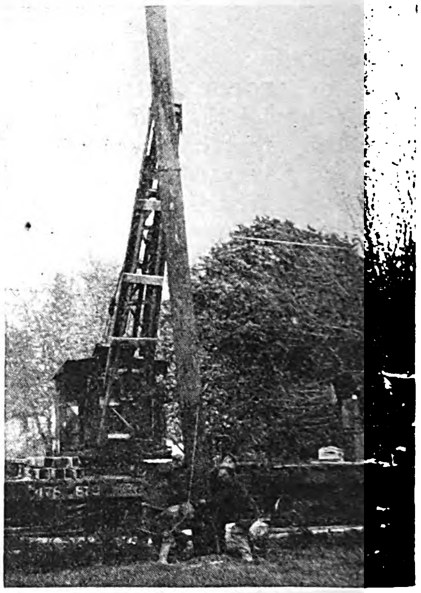
WHEN the Cleveland Electric Illuminating Company recently took over the light and power lines in Avon, Avon Lake and Bay Village, Ohio, formerly owned and operated by the local electric interurban railroad, it was confronted with the necessity of reconstructing the line to bring the service to a higher standard. The work presented a number of problems, not the least of which was rebuilding the main feeder for the territory so as to make it a 33,000-volt line along the right-of-way acquired from the Lake Shore Electric Railroad. This ran close to an 18,000-volt feeder in use by the interurban line, which made the job highly hazardous.

The program called for setting more than 9 miles of poles ranging in height from 45 to 64 ft. and stringing wires on them.

From the standpoint of weather, no more unfortunate time for this work could have been chosen. Rain was almost incessant, windstorms were frequent and much of the ground along the right-of-way was a quagmire. Service requirements made it necessary that the work go forward with all possible speed despite obstacles.

For a number of years the line department had relied on its hole-digging and pole-setting machines, which were installed on motor trucks. The engineers soon found, however, that the trucks were unsuitable for more than half of this job as there were no roads and the fields were impassable for caterpillar tractors. Setting by manual labor, of course, was a slow process and the urgent need for service made speed necessary.

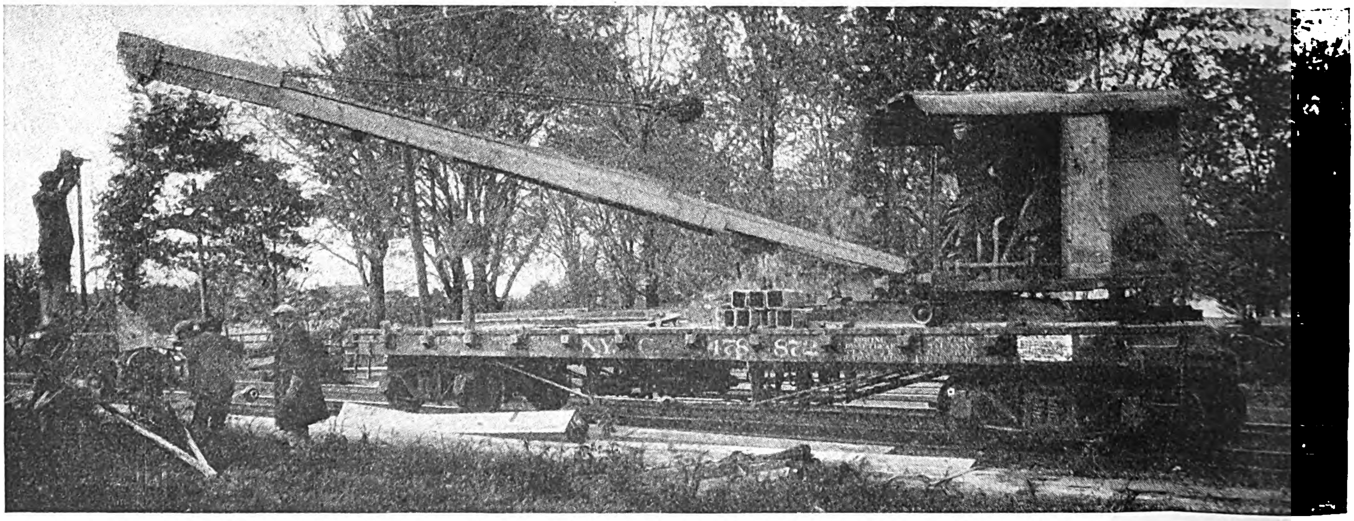
The company had two Universal cranes which were mounted on White trucks. These were used for general construction, such as digging conduit trenches, backfilling, handling surplus materials, transporting cable reels, loading, unloading and setting poles, dipping poles into creosote pits, erecting substation steel, erecting transmission towers and moving transformers. A flat car was obtained from the New York Central Railroad and one of the cranes was readily removed from its motor truck and mounted above the truck at one end of a flat car. This equipment, hauled by an electric locomotive, made a handy means for distributing the poles along the interurban right-of-way and for placing them in the holes when dug.



Setting a pole in position after the hole has been dug

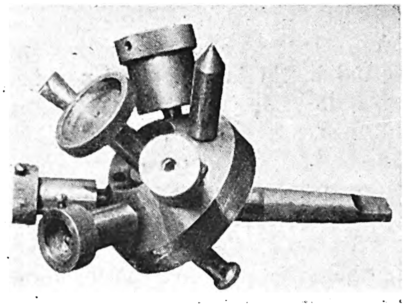
For the hole-digging operation the line department used a new type of portable hole borer built by the Buda Company. This is a special type of unit built for use with the Universal crane with a bale which enables the crane to pick it up and swing it into place. An artillery leg style tripod provided quick adjustment in position over the hole as soon as the crane set it down.

When the equipment came to the site for a pole the crane lifted the borer off the car and set it over the



Placing the hole borer in position for digging a hole spot where the hole was to be dug. A gasoline engine on the borer was cranked and in an instant the dirt was flying. In this way 185 poles were set in less than half the time that it would have taken by hand. A good day's run averaged thirteen set-ups, which included digging the post holes, moving time and setting 55-ft. poles in the holes. Linemen followed up the pole-setting crews closely, stringing, sagging and tying ¾ mile of wire per day.

Turret Tool Holder for Tailstock of Small Lathe



Turret head used to hold six tools in the tailstock of an ordinary lathe

In electric railway repair work it is sometimes necessary to make small parts, such as special screws, pins, bushings or studs, which require several tools for the complete finishing. For such work a turret tool holder which can be placed in the tailstock of an ordinary lathe has been devised and is in use in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. The holder shown in the accompanying illustration is arranged for attaching six different tools—three holders for dies or hollow mills, a drill, a drill chuck and a center.

Provision is made for attaching such tools to the conical surface of the turret, which is at an angle of 45 deg. with the circular face which fits against the bottom retaining portion of the turret head. This bottom circular retaining portion is mounted at an angle of 45 deg. to the axis of a tapered shank of size and shape to fit into the lathe tailstock. It will be seen that when a tool is rotated to the bottom position of the turret head it will line up accurately with the supporting shank and so in effect be an extension of the shank.

The knurled knob in the center of the device is for rotating the tools to their proper positions. Headless set screws on the inside conical surface clamp the various tools securely in position. At the back of the stationary face of the turret head is a coned projection which contains a pawl, which is pressed into holes in the rotating part of the turret head by a spring. This pawl can be released by pulling a small knurled knob seen on the back, and then the turret head can be rotated until the desired too is in position and locked securely.

Win One of the

Maintenance Prizes

Did the seven short items published in last week's Maintenance Data Sheet section of Electric Railway Journal suggest any improved methods or devices that you are using, which should be entered in the Maintenance Competition? Look them over carefully. They illustrate the class of material that will win the prizes.

Three Capital Prizes

First	$200
Second	$100
Third	$ 50

Any one who wins one of the prizes will be recognized as a leader in improved maintenance. Here is a chance to win the recognition you deserve.

Equipment men are off to a flying start, as is evidenced by the large number of items received from equipment departments. Line and track maintenance men are urged to send in descriptions of some of the useful things they are doing.

In addition to the capital prizes, $25 will be paid each month to the winner of the monthly contest.

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by Electric Railway Journal for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of Electric Railway Journal, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 each will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of Electric Railway Journal.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of Electric Railway Journal, to be published in September, 1927.

New Equipment Available

Large Welding Rods

"DIPPED" welding rods of a new type are now obtainable from the Lincoln Electric Company, Cleveland, Ohio. This dipped steel rod is the result of several years study in the company's research laboratories and will be known as "Stable-Arc" welding rod. With this new rod it is possible to go to considerably larger diameters than has been customary in welding rods for metal electrode welding and is being carried in all sizes up to ½ in.

It is claimed that this rod permits of much higher currents than has been used heretofore, with the resulting greater speed. As labor is by far the greatest factor in welding costs, increased speed means a substantial decrease in welding cost. Not only does the greater heat give greater speed and less cost but also better penetration and a much smoother finished bead. In addition the greater heat obtainable by the higher currents results in an annealing action which increases the ductility of the weld and gives a greater elongation. Current densities of 15,000 amp. and more per square inch can be used.

The claimed decrease in the "splutter" of the arc gives less spattered metal and therefore more actual metal is deposited per pound of rod. The higher currents, it is claimed, give a remarkably clean finished weld and on heavy welds of more than one layer very little brushing is necessary between beads.

"Stable-Arc" welding rod is obtainable in standard 50-lb. bundles wrapped in burlap and in lengths of 14 in. It can also be secured in longer lengths if desired.

Electric Railway Wrecker

FOR use on the trolley system of Cologne, Germany, a crane mounted on a car has recently been constructed by the Linke-Hofmann Werke Gesellschaft of that city. It is used for removing motor vehicles which break down on the track and so interfere with traffic and also for handling electric railway supplies, such as rails, ballast, etc.

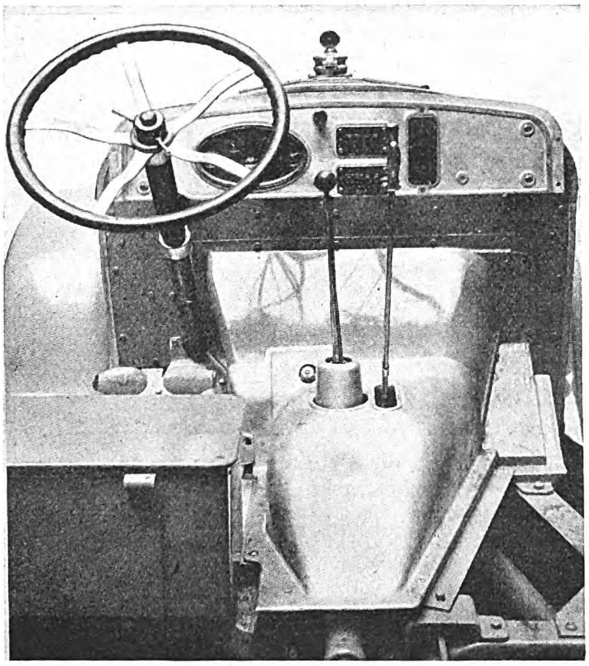
The crane is mounted on a double-truck car equipped for motor drive from the trolley circuit arranged for control from either end. The crane, which is mounted on a turntable in the center of the car, has capacity to lift loads up to 1¾ tons. The electrical equipment was manufactured by the Allgemeine Electricitäts Gesellschaft and includes two 60-hp., 600-volt motors for driving the car, an 8-hp. shunt-wound motor for the lifting load and a 4-hp. series motor for rotating the crane about the turntable.

Improved Bus Chassis

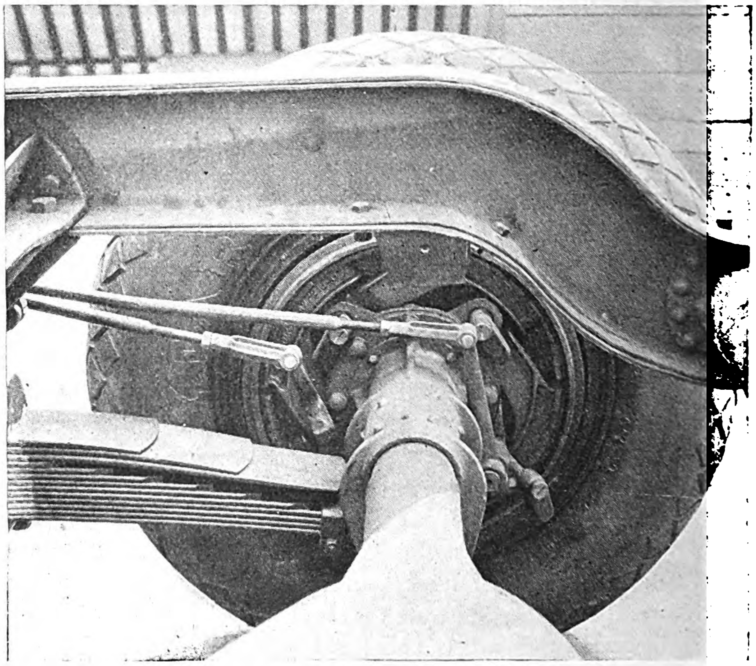
SEVERAL interesting improvements have been incorporated in the latest type of chassis marketed by the Six-Wheel Company, Philadelphia, Pa. These include a permanent dash with the instrument panel and all instruments grouped under glass. The hood is fitted at the factory to a ledge on the permanent dash and all chassis wiring is completed to junction boxes and to the instrument panel. A cast-aluminum transmission cover and aluminum floor covers are also installed. The metal battery box forms a permanent base for the driver's seat.

Brakes are of the locomotive brake shoe type, four shoes for each wheel being used. All hinge pins and wearing parts of the brake assembly are lubricated. Either Westinghouse air brakes or the B-K vacuum booster brake system is furnished for service use and an entirely separate B-K booster is employed for the hand brake. Each system acts independently of the other and provides 530 sq.in. of brake area.

The exhaust is carried to the extreme left rear of the chassis and the heating system used in the body is connected to the exhaust line of the power plant. The 70-gal. gas tank is attached to the frame by spring trunnions. The crankcases are of duralumin. Counterbalanced crankshafts, vibration dampeners and ventilated clutches help to increase the efficiency.



A permanent dash with instrument panel is provided



Brakes are of the locomotive brakeshoe type, four shoes for each wheel

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—3

RULES COVERING

The Condition and Repair of Freight Cars for Interchange Service

Central Electric Railway Master Mechanics Association

Adopted May 11, 1927 **Effective Jan. 1, 1928**

These rules are formulated as a guide to the fair and proper adjustment of all questions arising between car owner and handling company with the intent of:

1. Making car owners responsible for and, therefore, chargeable with, the repairs to their cars necessitated by ordinary wear and tear in fair service and by the safety requirements of the United States safety appliance standards as applied to electric railways, and by the standards of the Central Electric Railway Association.
2. Placing responsibility and providing a means of settlement for damage to any car occurring through unfair usage or improper protection by the handling company.
3. Inspection of freight cars for interchange and a uniform system on which acceptance or rejection of cars offered in interchange are based.

Care of Foreign Freight Cars

Rule 1. Each railroad is responsible for the condition of all cars on its line, and must give to all equal care in handling and inspection.

Rule 2. Cars having defects for which delivering company is responsible must be properly carded when offered in interchange, as per Form 1. Empty cars offered in interchange must be accepted if in safe condition and serviceable for some commodity that can be loaded in the car, the receiving road to be the judge. Owners must receive their own cars, when offered home for repairs at any point on their line, subject to the provisions of these rules. Empty cars furnished on orders for specific lading must be in serviceable condition for such lading, the receiving road to be the judge. If not acceptable they must be carded with return card Form 2.

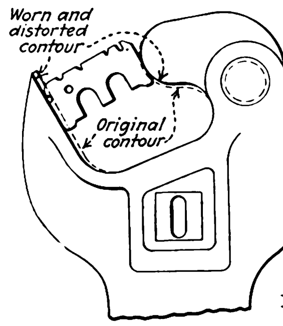


Fig. 1

Rule 3. Loaded cars offered in interchange must be accepted when in safe operating condition and when meeting the allowable clearances and permissible weight as determined by track, bridges and structures, with the following exceptions:

(*a*) Cars (whether loaded or empty) having defects in violation of the Safety Appliance Acts, will not be accepted in interchange.

(*b*) Cars loaded with explosives must be handled in accordance with regulations of the Interstate Commerce Commission. Cars containing inflammable liquid which is leaking must be repaired or transferred without any unnecessary movement or at nearest available point.

(*c*) Cars improperly loaded when transfer or rearrangement of lading is necessary.

(*d*) Lading of open cars when dimensions of lading are in excess of clearances of roads over which the shipment is destined, the receiving road to be the judge.

(*e*) When cars can not pass third rail or overhead clearances for electrical conductors.

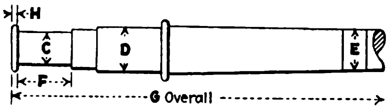
(*f*) Where roads require radial M.C.B. couplers, the rigid type will not be accepted in interchange.

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

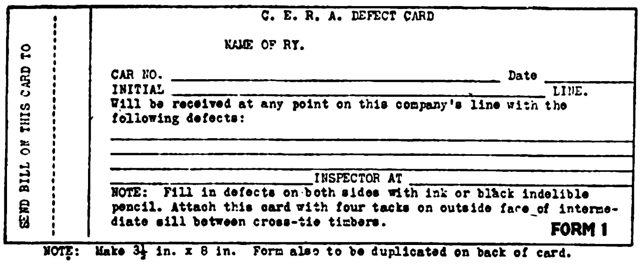
ROLLING STOCK—STANDARDS—7

C.E.R.A. Standard Axles and Limits of Wear



A Total Weight on Rail Lb.	B Nominal Capacity Lb.	Limits of Wear					Dimensions, New						
		C In.	D In.	E In.	F In.	H In.	C In.	D In.	E In.	F In.	G Ft.	G In.	H In.
251,000	200,000	6	7⅞	6¾	12½	¼	6½	8⅛	6⅞	12	7	8¾	⅞
210,000	140,000	5½	7⅜	6 5/16	11½	¼	6	7⅝	6 7/16	11	7	6¾	⅞
169,000	100,000	5	6¾	5¾	10½	¼	5½	7	5⅞	10	7	4½	¾
136,000	80,000	4½	6¼	5¼	9½	¼	5	6½	5⅜	9	7	2½	¾
103,000	60,000	3¾	5½	4 11/16	8½	¼	4¼	5¾	4¾	8	7	0¼	⅝
66,000	40,000	3¼	4⅞	4 3/16	7½	¼	3¾	5⅛	4¼	7	6	11¼	⅝

C.E.R.A. STANDARD DEFECT CARD



SEND BILL ON THIS CARD TO

C. E. R. A. DEFECT CARD

NAME OF RY.

CAR NO. ______________________ Date ________

INITIAL ______________________ LINE.

Will be received at any point on this company's line with the following defects:

______________________ INSPECTOR AT ______________

NOTE: Fill in defects on both sides with ink or black indelible pencil. Attach this card with four tacks on outside face of intermediate sill between cross-tie timbers.

FORM 1

NOTE: Make 3½ in. x 8 in. Form also to be duplicated on back of card.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—4

C.E.R.A. Inspection Rules (Continued)

Rule 4. The following defects must be repaired by receiving line while car is under load:

(*a*) Journals are to be lubricated or repacked when necessary; when bearings are required, the same kind are to be used when possible.

(*b*) All brake rods, levers, pins, brake beams and brake shoes.

(*c*) All air hose, cocks, valves and piping.

(*d*) Couplers, worn and distorted knuckles, chains and levers used for coupling and uncoupling.

(*e*) Temporary repairs to roof when condition of same endangers lading and when such repair does not exceed 25 per cent of the roof covering.

(*f*) Missing or defective side or end doors when same endangers lading from weather or theft.

Rule 5. A bad order foreign car delivered under load, if load is transferred or unloaded within switching district, may be returned to delivering line properly side-carded on both sides showing the defects for which the car was transferred or returned, in which case it must be accepted unless the receiving line has a direct physical connection with the car owner at that point, car to be carded as per Form 3.

Rule 6. In rejecting cars because of defects in violation of rule 3, all of the defects objected to must be designated with ink or black indelible pencil on return cards Form 2 and placed on both sides of car.

Rule 7. No car will be accepted in interchange unless properly equipped with United States safety appliance standards as applied to electric railways.

Rule 8. If a foreign car has defects, the receiving line shall require that a defect card be securely attached to the car, as per rule 2. Defect card shall not be required for any slight damage (new or old), that of itself does not require repairs before reloading of car. Defect cards shall not be required for raked or cornered sheathing, roof canvas, bent or cornered end sill if defects are old.

At points where joint inspection is not in effect, the matter will be left to the judgment of the receiving line. Where joint interchange inspectors are employed, the decision will be made by them.

Rule 9. All cards must be of the form specified in these rules and must plainly specify each item, indicating location of defects, as provided in these rules.

Rule 10. Any car having defects which render it unsafe to run, unsafe to trainmen or any lading suitable to car, must be repaired and be made safe to return to owner, billing repair card Form 4 to be used.

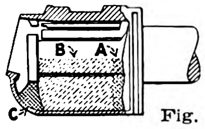


Fig. 2

Rule 11. The end of the car toward which the cylinder push rod travels shall be known as —*B*— end and the opposite end shall be known as —*A*— end. Facing —*B*— end of car, in their order on the right side of car, wheels, journal boxes and contained parts, shall be known as R1, R2, R3, R4, and similarly those on the left side of car shall be known as L1, L2, L3, L4. The same order of numbers shall be used for designating corresponding location of brake beams. In any case where right or left side is designated on defect, billing repair or joint evidence cards for other parts of cars, the same uniform order of location shall govern.

Rule 12. Cars must be maintained within the limits of standard height for couplers, measured from top of rail to center line of coupler head. As far as possible, cars should be adjusted when empty. When construction of car and trucks precludes the common methods of adjusting coupler heights, the application of metal shims between journal boxes and arch bars will be permissible. The use of liners between male and female portions of center plates is prohibited where the vertical bearing surfaces are reduced. The limits of height from top of rail to center of couplers shall not be less than 31½ in. and not more than 34½ in. under any condition of loading. When bill is rendered the height of car before and after altering must be shown in billing repair card Form 4.

Rule 13. Bills may be rendered against car owners for applying temporary transverse tie rods to cars with sides spread or bulged beyond the clearance limits of the handling line.

Rule 14. Couplers that exceed the distance of 5¼ in. between point of knuckle and guard arm, measured perpendicularly to guard arm, must have the defective part or parts renewed to bring coupler within gage, in which case owner is responsible (see accompanying Fig. 1). When couplers of another make are applied to a car, the uncoupling arrangement shall be made operative at expense of the company making repairs. But in no case shall such changes be made that will destroy the original design providing the owner wishes to change again to meet their standard.

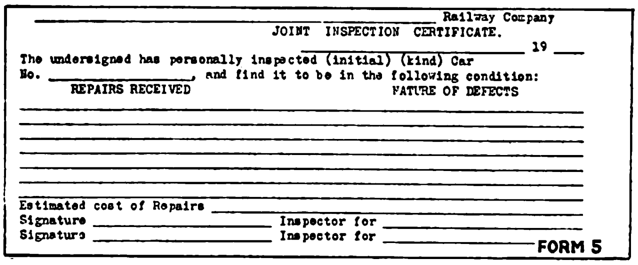
Locking device must come within 2 in.

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—8

C.E.R.A. Inspection Cards



____________________ Railway Company

JOINT INSPECTION CERTIFICATE.

________________ 19 ___

The undersigned has personally inspected (initial) (kind) Car No. __________, and find it to be in the following condition:

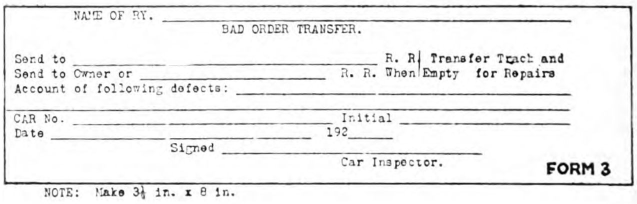
REPAIRS RECEIVED NATURE OF DEFECTS

Estimated cost of Repairs ________________

Signature ____________ Inspector for ____________

Signature ____________ Inspector for ____________

FORM 5



NAME OF RY. ____________________

BAD ORDER TRANSFER.

Send to ________________ R. R. Transfer Track and

Send to Owner or ____________ R. R. When Empty for Repairs

Account of following defects: ________________

CAR No. ____________ Initial ____________

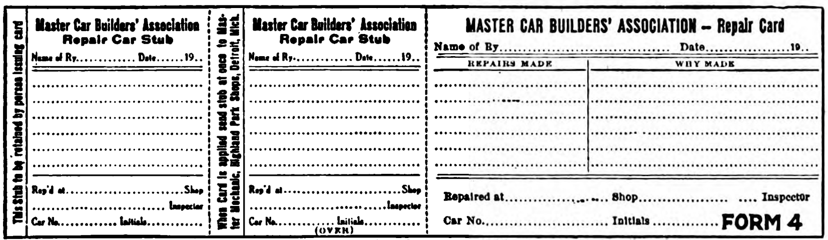
Date ____________ 192____

Signed ________________

Car Inspector.

FORM 3

NOTE: Make 3½ in. x 8 in.



This Stub to be retained by person issuing card

Master Car Builders' Association
Repair Car Stub

Name of Ry............ Date......19..

Rep'd at........................Shop
........................Inspector
Car No........... Initials...........

When Card is applied send stub at once to Master Mechanic, Highland Park Shops, Detroit, Mich.

Master Car Builders' Association
Repair Car Stub

Name of Ry............ Date......19..

Rep'd at........................Shop
........................Inspector
Car No........... Initials...........
(OVER)

MASTER CAR BUILDERS' ASSOCIATION – Repair Card

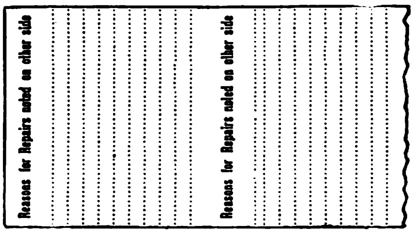
Name of By.............................. Date...............19..

REPAIRS MADE	WHY MADE

Repaired at.................. Shop.................. .... Inspector

Car No.......................... Initials .... FORM 4

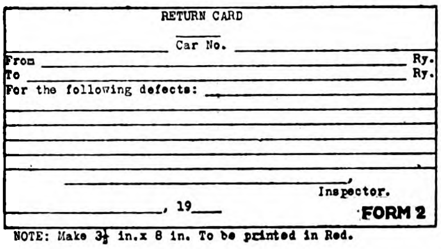
Front Side. Make 3¾ in. x 15¾ in.



Reasons for Repairs noted on other side

Reasons for Repairs noted on other side

Reverse Side of Form 4



RETURN CARD

__________ Car No. __________

From ________________ Ry.

To ________________ Ry.

For the following defects: ____________

________________,
Inspector.

____________, 19___

FORM 2

NOTE: Make 3½ in.x 8 in. To be printed in Red.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—5

C.E.R.A. Inspection Rules (Continued)

of knuckles. Anchor must not be loose and no anchor bolts missing. No cracks or defects on knuckles or drawbars or anchors are permitted.

Rule 15. *Wheels.* (*a*) Tread thickness measured 1 in. from edge of rim shall not be less than ¾ in. (*b*) No wheels must have over ⅛ in. hollow tread. (*c*) Flanges not less than 11/16 in. thick. (*d*) Treads not to be over 3⅞ in. wide or under 3 in. at any point. (*e*) Must not have chipped flanges more than ⅜ in. wide x 1½ in. long. (*f*) Steel wheels must not have a flat spot over 2 in. long and cast iron wheels must not have a spot over 1 in. long. (*g*) Wheels must not be less than 54 in. inside measurement at gage line.

Rule 16—*Brakes.* (*a*) Not less than 6 in. or more than 8 in. piston travel under load. (*b*) Heads, beams, pins, rods, hangers, etc., must be in good repair. (*c*) Hand brake must be efficient and in good repair.

Rule 17—*Trucks.* (*a*) Side bearings to have at least 1/16 in. clearance under load. (*b*) Center bearings must be O. K. and well lubricated.

Rule 18—*Axles.* (*a*) The total weight of car and its lading must not exceed weight given in column "A." Column "B" is the nominal capacity stenciled on all cars. Axles must be removed from service when less than the prescribed limits in columns "C," "D," "E," in table of C.E.R.A. standard axles or when the condemning limits in columns "F" and "H" are reached.

(*b*) Standard A.E.R.E.A., axles must be used in replacing A.E.R.E.A. standard axles, subject to the condemning limits for such axles.

(*c*) When second hand axles are applied, the diameter of wheel seats and centers must not be less than the limiting dimensions shown, and the diameter of the journals must be at least ⅛ in. greater than the limiting dimensions. The length of journals must not exceed ⅜ in. over standard length, the collar must not be less than 5/16 in. thick and the fillet at back end of journals on axles of 40,000 lb. capacity cars must not be less than ⅛ in. radius, axles of 50,000 and 60,000 lb. capacity cars not less than 5/16 in. radius, nor less than ⅜ in. radius on axles of greater capacity.

Rule 19—No cast iron wheels will be accepted in interchange after Jan. 1, 1930.

Rule 20—All coupling hose must be 1⅜ in. x 18 in. with F.P.5 coupling and all flexible drawbar hose must be 1⅜ in. Other sizes will not be accepted in interchange after Jan. 1, 1930.

Rule 21—*Journal.* (See accompanying sketch.) Application of packing (*a*) Inner —In packing a journal box, twist somewhat tightly a rope of packing and place it in the extreme back part of the box, as shown at "A" in the accompanying Fig. 2. Make sure that it is well up against the journal so as properly to lubricate the fillet on the journal and keep out the dust.

(*b*) Main—Apply sufficient packing (preferably in one piece) to fill the space shown at "B." Take care to have this packing bear evenly along full length of the lower half of the journal. The packing should not be too tight but should be tight enough to overcome any tendency to settle away from the journal. The packing should extend to approximately the center line of the journal but not above at any point, and should be pressed down evenly at sides that no loose ends may work up under the journal bearings.

(*c*) Outer—Apply a third piece of firmly twisted packing as shown at "C," and pack tightly in order to prevent displacement of the main packing. There should be no loose ends hanging out of the box as they would tend to draw out the oil.

Rule 22. In no case shall car owner be charged for the second or subsequent applications of journal bearings if applied within 30 days from initial application at the same journal location on same road, except when renewed within such period account change of wheels or axle at same journal location, in case the application of wheels is chargeable to the owner.

Rule 23. Companies shall promptly furnish to each other, upon requisition, and forward, freight or express charges collect from point of shipment, material for repairs of their cars on foreign lines. If material is for repairs of car owner's defects, the foreign company may bill car owner for the entire freight charges, and in such case the car owner may reclaim freight charges for that portion of the movement over its own lines. If the material is for repairs of user's defects, the foreign line may reclaim only for that portion of the movement over its line.

A separate bill, with copy of freight, express or due bill attached, should be rendered for the freight or express charges showing reference to bill covering repairs.

Requisitions for such material shall specify that same is for repairs of car, giving car number and initial of such car, together with pattern number, sketch or other data to enable correct filling of requisition.

Rule 24. Repairs to foreign cars shall be promptly made, and the work shall conform in detail to the original construction, and with the quality of material originally used.

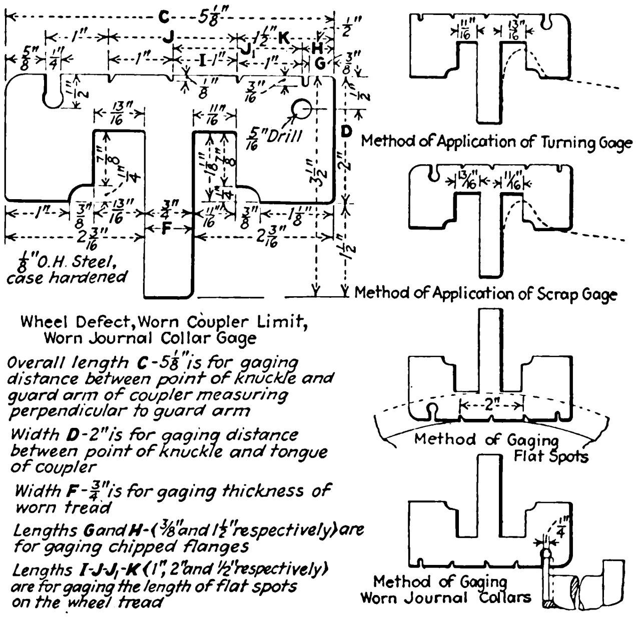
Rule 25. Any foreign road making partial or full repairs of defects on a car which is covered by a defect card, will have the defects repaired, crossed off the

(*Continued on next page*)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—9

C.E.R.A. WHEEL DEFECT, WORN COUPLER LIMIT, WORN JOURNAL COLLAR GAGE



Method of Application of Turning Gage

Method of Application of Scrap Gage

Method of Gaging Flat Spots

Method of Gaging Worn Journal Collars

Wheel Defect, Worn Coupler Limit, Worn Journal Collar Gage

Overall length ***C***-*5⅛" is for gaging distance between point of knuckle and guard arm of coupler measuring perpendicular to guard arm*

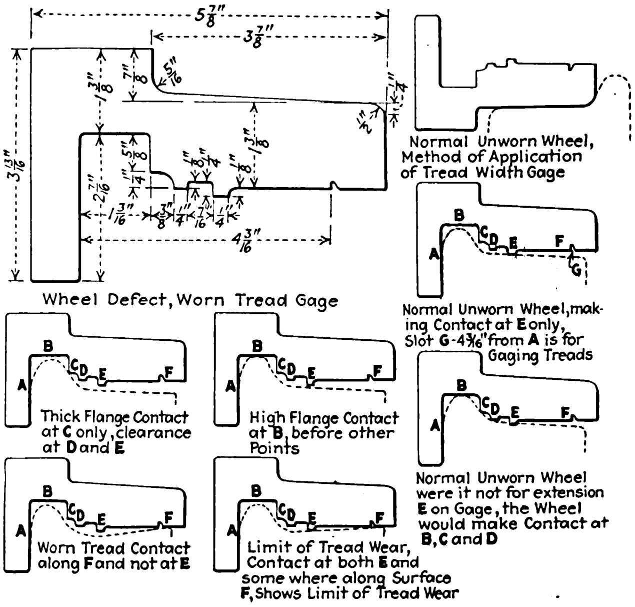
Width ***D***-*2" is for gaging distance between point of knuckle and tongue of coupler*

Width ***F***-*¾" is for gaging thickness of worn tread*

Lengths ***G*** *and* ***H***-*(⅜" and 1½" respectively) are for gaging chipped flanges*

Lengths ***I-J-J₁-K*** *(1", 2" and ½" respectively) are for gaging the length of flat spots on the wheel tread*

C.E.R.A. WHEEL DEFECT WORN TREAD GAGE



Wheel Defect, Worn Tread Gage

Normal Unworn Wheel, Method of Application of Tread Width Gage

Normal Unworn Wheel, making Contact at **E** only, Slot **G**-4 3/16" from **A** is for Gaging Treads

Normal Unworn Wheel were it not for extension **E** on Gage, the Wheel would make Contact at **B**, **C** and **D**

Thick Flange Contact at **C** only, clearance at **D** and **E**

High Flange Contact at **B**, before other Points

Worn Tread Contact along **F** and not at **E**

Limit of Tread Wear, Contact at both **E** and some where along Surface **F**, Shows Limit of Tread Wear

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—6

C.E.R.A. Inspection Rules (Concluded)

original card with ink or indelible pencil and card replaced on car. A copy of the card so marked should accompany the bill.

Rule 26. When repairs are made to a foreign car, card Form 4 shall be used embodying the required information and reason why such repairs were required. Heads of mechanical departments will exchange memorandums in duplicate of labor and material charge plus 15 per cent applied to foreign cars during month for the purpose of having same approved so billing can be made by auditing department.

Rule 27. When repairs are made to a foreign car for which a bill will be rendered, immediately upon completion of such work a notice must be sent to the owner or Form 4.

Rule 28. Defect cards and joint evidence cards must be securely attached to both sides of car with at least four tacks.

Rule 29. No labor to be charged for the inspection of cars, testing or adjusting brakes, adjusting angle cocks, tightening unions, bolts, bolt nuts, lag screws or spreading cotters, sill steps, and hand bolts or straightening on car, brake shafts, uncoupling levers or carrier irons when not removed from car. No charge to be made for the material or labor of lubrication except when renewals are made due to defects.

Rule 30. On the first of each month, the operator will promptly forward to the owner a statement of the individual mileage operated by such owner's cars, for its information in connection with maintaining mileage records of cars and equipment of cars.

Rule 31. Delivering company is responsible for any of the following when happening on their line:

(*a*) Removing or cutting out parts of car so as to facilitate loading or unloading.

(*b*) Known theft of parts of car occurring on its lines.

(*c*) Damage to any car if caused by: (1) Derailment; (2) cornering; (3) sidewiping; (4) collision; (5) colliding with or shoving over bumping posts or other fixed obstructions; (6) overloading; (7) collapsing buildings or other structures on right of way; (8) unconcealed fire damage; (9) failure to close hoppers or drop doors before moving car; (10) improper coupling of cars; (11) improper coupling of cars at excessive speed; (12) unfair usage of equipment.

Rule 32. Damages to foreign car for which the delivering company is responsible should be repaired at once unless such damaged car is under load and can proceed to destination in conformity to rules as herein prescribed. The company responsible for the damage shall at once notify the owner and arrange how or by whom the repairs shall be made.

Rule 33. When a car having damage for which delivering line is responsible is found with other defects which are ordinarily the owner's responsibility and are not associated with delivering line defects, such fair usage defects may be repaired at car owner's expense. Reported on billing repair card Form 4.

Rule 34. When a foreign car is destroyed or badly damaged, the owner shall upon request, furnish depreciated reproduction value of car complete, and the company responsible shall have the option of repairing or settling under the depreciated reproduction value. Depreciations to be figured from the date that the car was built or if built or acquired prior to when the road came under the acts of the Interstate Commerce Commission, its value as there fixed should be used to figure from.

Rule 35. For the mutual advantage of railway companies interested, the settlement for a car owned or controlled by a railway company, when damaged or destroyed upon a private track, shall be assumed by the railway company delivering the car upon such tracks.

When a car owned or controlled by a railway company is damaged or destroyed on the tracks of a road which is not a member of the per diem rules agreement of the Central Electric Railway Association or not a subscriber to these rules, the road responsible for the per diem while in the possession of the non-subscriber shall be responsible to the owner for damages to or for the destruction of the car.

Rule 36. If the company on whose lines the car is destroyed elects to rebuild the car, the original plan of construction must be followed, and the original kind and quality of material used. No allowance shall be made for betterments not authorized by car owner.

Rule 37. When a foreign car requires general repairs such as wheels, truck frames, bolsters, broken axles, etc., for which the owner is responsible and its condition will not permit its return home, it shall be inspected by the handling line and an inspection certificate made, using Form 5 (except the joint inspection will not be necessary) covering all defects found on car, and estimated cost of repairs, total labor and total material separately.

The inspection certificate shall be forwarded promptly to car owner together with list of material required to be furnished by the owner, with shipping directions. The car owner shall promptly inspect, if he so desires. If plans or specifications are required they shall also be requested. Standard safety appliances must be completely applied.

Electric Railway Journal Maintenance Data Sheet

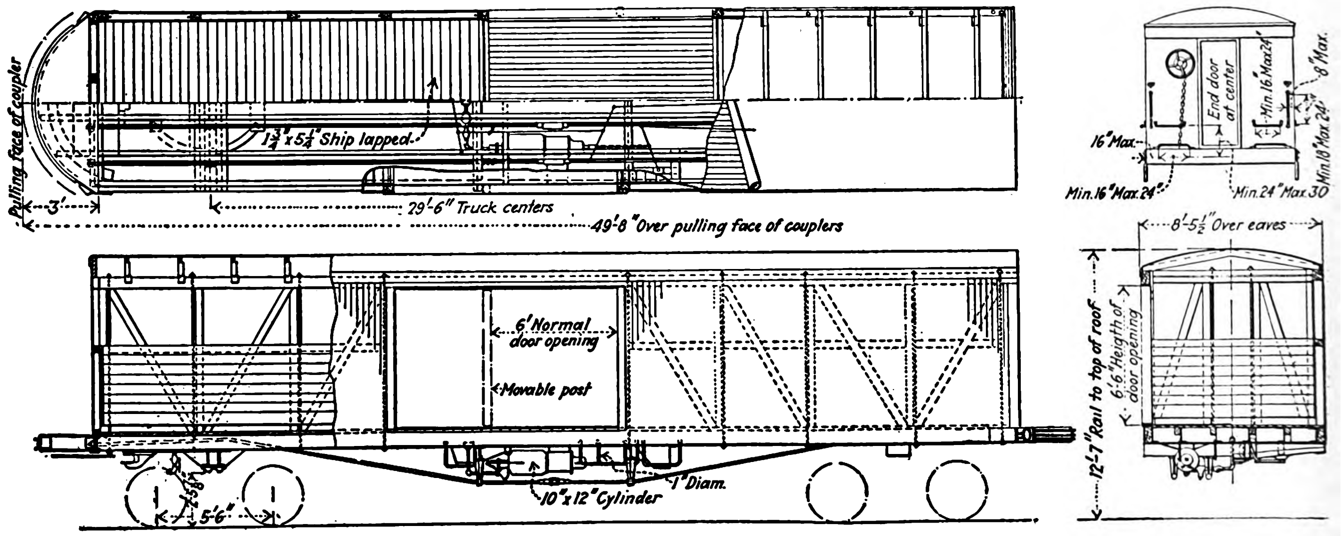
ROLLING STOCK—STANDARDS—10

GENERAL DIMENSIONS OF THE C.E.R.A. FREIGHT CAR

Length over coupler pulling face	49 ft. 8 in.
Length over buffer beams	48 ft. 8 in.
Length inside at corner post	42 ft. 4$\frac{1}{2}$ in.
Center to center of king pin	32 ft. 0 in.
Width over side sills	8 ft. 3 in.
Width over side sheathing	8 ft. 4$\frac{5}{8}$ in.
Width inside	7 ft. 6$\frac{3}{8}$ in.
Width at eaves	8 ft. 5$\frac{1}{2}$ in.
Extreme width	9 ft. 0 in.

Rail to center of coupler	2 ft. 10$\frac{1}{8}$ in.
Rail to bottom of side sill	3 ft. 7$\frac{5}{16}$ in.
Bottom of side sill to top of side plate	7 ft. 11$\frac{9}{16}$ in.
Top of side plate to top of roof	0 ft. 12$\frac{1}{8}$ in.
Floor to under side of carline at center at door	7 ft. 9$\frac{9}{16}$ in.
Rail to top of roof at center	12 ft. 7 in.
Height of door opening	6 ft. 6 in.
Width of door opening	10 ft. 0 in.

Capacity	80,000 lb.
Trucks	Four-wheel arch bar type
Rail to center plate bearing surface	2 ft. 5$\frac{7}{8}$ in.
Track gage	4 ft. 8$\frac{1}{2}$ in.
Truck wheelbase	5 ft. 6 in.
Journals	5 in. 9 in.
Brakes	Inside hung
Radius of sharpest curve at center of track	35 ft. 0 in.



Association News & Discussions

Reproduction Cost Unsatisfactory as Basis for Rate Making[*]

By Hon. Lewis Goldberg
Commissioner Massachusetts Department of Public Utilities

NOWADAYS the reproduction theory is sweeping the minds of the utility owners of the country and making them feel that at last the panacea has come if they only can have rates established on a reproduction cost basis. As generally understood, the reproduction theory is that, in determining what the base rate for a utility should be, you determine the value of the plant on a reproduction basis, with costs of labor and materials projected into the reasonable future, minus observed depreciation; guess whether the plateau of prices will remain more or less on a level or whether they will go up or down; take into consideration the original cost and the historical cost; add assumed costs of organization, engineering and supervision; add theoretical costs of financing and interest during construction; and take into consideration such other factors as may seem to be pertinent. Just take all of these factors and such other factors as may be pertinent and jumble them all together and assume that this reproduction theory will furnish what you would like to have the rate base to be; and if it doesn't give you the desired result, get a new theory.

Is Not Sound Business

Now, as business men, if someone told you that the value of your respective plants was based on any such scheme as that, you would laugh them to scorn. The fact is that when plants are sold, the managers and owners of the utility selling out do not give the slightest thought to what the reproduction cost would be; nor do the managers or owners of the combination buying the utility give any thought to what the reproduction value would be. It may be, from an economic viewpoint, that is a fair test as to whether the reproduction theory has any value.

You look at your book assets, you inspect your earnings sheet, you examine your operating expenses, you want to know how depreciation has been taken care of, and you look at the plant as it is and not at some fanciful theoretical plant which might be reproduced in exactly the same manner as this plant now exists. It is unsound because it is not businesslike from that point of view, and further because it is not true to fact, because never in this business world would any plant be reproduced as it is if you were going to build it from the ground up. There is no plant that would ever be reproduced from the ground up just as that plant exists today. To say that it would, involves the supposition that since the inception, or rather since the formation of your business, since the beginning of the construction of your individual plant, there has been no improvement in the art of that utility. It would be rather a sad confession to make for any utility to say that since its inception there has been no improvement, and it would not be true.

Untenable Assumptions Made

Let us take the electric utility for example. Is there any electric plant existing anywhere in this commonwealth today that would be produced stone for stone, foundation for foundation, building for building, generator for generator, transformer for transfomer, just as that plant exists today? Why, of course, everybody knows it would not, and so your theory calls for the reproduction of something which would never be reproduced and involves taking into consideration the value of that which you would never buy today if rebuilding your plant.

For example, you have a garage which you use and which used to be a power house, and you have foundations for a power house. Under this theory you reproduce that garage with those foundations. You have a generator or a transformer which is almost passé so far as style and bodily improvement are considered. You are using it because it is still serviceable, but if you were going to buy another you would never purchase that type. Under the reproduction theory you would add the cost of reproducing that obsolete part of your plant and deduct observed depreciation, and observed depreciation is a very elastic term. I have heard experts testify that so long as the machinery is doing its work there is no depreciation, even though, if you were going to buy a new machine tomorrow, you never in this world would buy a machine like that; and that a building which is 50 years old is only 5 per cent depreciated for a rate case; for the payment of taxes its depreciation is about 90 per cent.

The reproduction theory, recognizing that there are certain things that can't be reproduced, is inconsistent with itself. It does not attempt to reproduce land, but it says we will take land at its present market value and not project it into the future as you do when you build your plant; not project it over a period of eighteen months or 24 months, whatever the period required for building a plant is, but your present market value, and we will take the prices of labor and materials and project them over this 24-month period needed for construction. Where is the consistency? Where is the consistency of taking one item on one basis and taking the plant on another basis? If a person is going to be inconsistent, he ought to be consistently inconsistent.

There is still one other inconsistency in the theory. They not only take the land at present market prices, they not only take the plant at a reproduction price projected into the future and attempt to calculate the labor and materials that go into that plant, and what the probable cost of that material will be over the period necessary for construction, and what the probable tendency of labor prices will be over that period, but with respect to certain of the assets they will determine a substitute for them, capitalize the cost of creating and operating this imaginary substitute for that particular part of the plant, and add this capitalized figure to the reproduction value. They say it would cost so much money to construct the substitute, the cost of operating it would be so much, and capitalizing this cost of operation and adding to it the cost of constructing the imaginary substitute, the result represents the reproduction value of that portion of the plant actually in use.

Cannot Determine Fair Rate

How does this theory work out in fact? Is it ever possible easily to determine whether a rate is fair or unfair? How can it be if under this theory the rate base is determined by the reproduction value, which in turn depends among numerous other factors on the future plateau of prices of both labor and materials? And so every rate case in such a situation involves an army of experts, involves intensive and expensive study, involves a considerable amount of time and a tremendous expenditure of money. And after you get all of that you haven't a collection of facts, but a collection of judgments of men, a collection of their guesses as to what is going to happen in the future.

This has been what the utility has to undergo in the ordinary rate case. Of course, the ratepayers have to pay for it. It is a part of the operating expense of the utility. How is the public going to meet such a case? Who of the public can afford or will undertake to expend the amount of money necessary to hire experts on the other side to make that same sort of a reproduction valuation? If that theory were carried out to its logical conclusion, there would in effect be no such thing as regulation of rates because the rates under such a rate base would be higher than those the utility could possibly charge the public and sell their commodity.

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[*] Abstract of address presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

Now, some utility men may say "Fine. You can't hurt our feelings by abolishing all regulation of prices." But you must have the public good will for the success of your business. No matter what the utility is, whether or not it is a monopoly, whether it is without any competition or whether it has some form of competition, if the public finds itself helpless to prevent constantly increasing rates in that utility, it will find a remedy for itself in other ways. The remedy for one thing will be a diminished use of the commodity; so diminished that the utility will receive less gross income under the enhanced rates than it would have received under the lower rates.

UNSOUND RATES BREED TROUBLE

But secondly, and what is perhaps more important, the public is a long suffering animal, it will endure a certain amount of, and perhaps a great amount of goading and prodding, but goaded too much and prodded too much, yoked to the utility that it is dragging, it will kick out its hind heels and smash that utility. The public is not helpless against constantly increasing rates. Monopolies exist in the utilities solely by virtue of the consent of the public; they are not inherent in the business. What is inherent in the business is the desirability of monopoly; the nature of the utility is such that from the viewpoint of efficiency and economic operation, it ought to have a monopoly. But if the aim or policy of the monopoly is exorbitant rates, that monopoly will cease to exist. Parallel or duplicate plants will arise by virtue of the repeal of the statutory laws which prohibit competition and municipalities will enter the field. That is not an untried feature, as you know. In Massachusetts we have some 44 municipal electric plants operated by the municipalities and operated profitably, and generally speaking the electric current sold by these municipal plants is sold at a rate less than the electricity which is sold by the private companies in the surrounding territory. Now if the utility should insist on reproduction value and demand rates upon that basis which will result, naturally will and must result, in rates which are very much in excess of those now complained of as being too high, and if the public is faced with the necessity of paying exorbitant rates or itself going into the business, do you, as business men visualizing the future, think for one moment that the public, having before it the example in our commonwealth of 44 municipal plants operating profitably and successfully, would hesitate to go into that business through the medium of its municipalities? Not for a single minute; and if you think for a moment that any legislature would dare to refuse the demand of the people to be permitted to enter into that business, you are mistaken. In view of that situation, the utilities should go rather slow before crying and cheering loudly for a reproduction theory valuation as a base rate.

COMING MEETINGS OF

Electric Railway and Allied Associations

May 31-June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

June 6-8—American Association of Engineers, annual convention, Tulsa, Okla.

June 9-11—Midwest Electric Railway Association, annual meeting, Hotel Chase, St. Louis, Mo.

June 13-16—National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.

June 15-16—American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.

June 19-23—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.

June 20-24—American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.

June 20-24—American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.

June 24-25—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 29-July 1—Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.

June 30-July 1—Tramways and Light Railways Association, annual meeting, Bath, England.

July 22-23—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Sept. 8—Central Electric Railway Master Mechanics Association, South Bend, Ind.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

It is not always wise to insist on your rights. Utilities must be careful about insisting upon all their rights. They should take an object lesson from the epitaph which appeared on the tombstone in a certain cemetery. Inscribed on the tombstone was the following:

Here lies the body of old John Gray,
Who died maintaining his right-of-way.
He was right, dead right, as he rode along;
But he's just as dead as if he were wrong.

And we recall studying in our school days, in the subject of ancient history, about a chap named Pyrrhus who led an army against Rome. He defeated the Romans, but in doing so he succeeded in annihilating his own army. Some victories destroy the victor.

There is another economic angle. Take a plant that was built in the peak of high prices in 1918, 1919, 1920 and 1921, when we had the highest plateau of prices since the inception of the country, particularly the years 1919 and 1920, when the prices reached the top of the figure. Consider, for instance, a plant built during that period, and in 1935, if prices are then considerably lower and it is asking for certain rates, we say to that utility, "You will get rates based on your reproduction value, less observed depreciation. You built your plant at the peak of high prices. Your reproduction value today is 25 or 50 per cent less than what you paid for it, and therefore you will only be entitled to a rate based on half the capital which you invested in that plant rather than on your prudent investment."

What is going to happen to that utility if the theory is enforced? Can a plant in which is invested $10,000,000 operate if it is going to be allowed a return on only $5,000,000 of its capital stock? You know and I know it would not take very long for that utility to be in the hands of a receiver, and yet, under a strict adherence to the reproduction theory, all it would be entitled to would be a return on $5,000,000 instead of the $10,000,000 invested.

Or, consider a utility, and we have many such, that built the major portion of its plant since the war at high prices. Just now we have prices that are high, but what may happen ten years from now if there should be another downward tendency? Will that utility then be able to operate or to furnish adequate service? The reproduction theory would then cut its rates in half, which would mean a return on only half of its capital invested. But still more important, would it be fair to say to the shareholders of the utility, "You can't get a fair return on the money which you honestly and prudently and reasonably invested in your plant. You will get a return on only half of your cost because you can now build another plant for half."

It is merely the present moment with its high prices which makes the reproduction theory seem advantageous to utility owners. If in the future there should be a decided drop in prices, the utility owners will clamor just as loudly against the reproduction theory as they did in 1893 when it was first promulgated and they fought it tooth and nail. The reproduction theory creates an unstable situation, and a most unsatisfactory and unsound economic condition, because neither capital nor the public can look forward with certainty to the future.

It is not a fanciful situation that I have pictured. In 1914 there was a rate case involving a street railway before the department, and the reproduction theory was then discussed. Had the reproduction theory been put into effect in that case, the street railway, instead of obtaining an increase in rates which it sorely needed, would have had a reduction in rates, because the plant could have been produced for a great deal less than the actual investment therein; and it was only by the application of the so-called prudent investment theory that that street railway was enabled to receive higher rates and pull through. It would have had to close its doors and go out of business if the reproduction theory had been logically applied.

In this commonwealth, whatever might be said of some of the Western states, practically from the inception of public utilities there has been regulation with respect to investment in the utility.[*] The company has received, generally speaking, dollar for dollar on its investment. There has been no water put into the stock; and so in this commonwealth, whatever may be the situation anywhere else, absolute fairness and equality of treatment both toward capital and toward the public require that, on the economic basis, the reproduction theory should be discarded and the prudent investment theory followed.

We have written into our law various things from time to time; we are endeavoring to write social justice into our law. Just now there seems to be the most vital need for writing into the law economic justice.

Causes of Radio Interference Analyzed[*]

By James Thompson

Signal Department, United Electric Railways,
Providence, R. I.

About a year and a half ago our first radio complaints were beginning to arrive at our office. For the first six months of that period we made no decided organized effort to eliminate this interference; in other words, we took the first man who was available and sent him out on the trouble. Results were rather indefinite as we made no check to find out if we had entirely eliminated the disturbance, and at that time we kept no complete records of these complaints.

During the past year, however, we have put our work on an organized basis. Complaints are received by letter, telephone and through the radio departments of other local utilities. The data obtained is immediately put on a regular "radio form" and a number assigned to this report. It is then forwarded to the inspector who has charge of this department and he takes up the complaints in that order. He is supplied with the necessary help and equipment to clear up any trouble which may be found in our transmission or distribution systems or communication apparatus, such as automatic signals, contactors, hand signals, switch lights, etc.

Test Apparatus Simple

The outfit used consists of a sectional bamboo pole with lead-in wire attached, voltmeter, ammeter and copper plate for grounding. With this equipment voltage or current readings are taken on spans, pull-offs or any other aerial apparatus which may be suspected of causing a leak to ground.

If you were to ask some of the good folks who live along our trolley system what station they receive strongest they would look at you with mournful eyes and say "The trolley! We can't get a thing on our set when the cars go by. Why, mister, we hear the car as soon as it leaves Jacks' Corners until it gets away down to Job's T.C. There it passes another trolley, which immediately starts back, and after it leaves Jacks' Corners we get about five minutes to hear our set, when another car starts from the corners." There you are—it's the same old story in the same old way. The only difference is the tone of voice of the complaint.

To date we have received no complaint that could be traced to our a.c. lines or substations. This, we believe, is because our lines are so well insulated and effectively maintained. Therefore, it is to be understood that the sources of interferences will be confined to the d.c. distribution circuits and the rolling equipment.

We have a simple theory by which to picture how this interference exists. It has been proved that an alternating current of electricity flowing through a conductor sends out lines of force which can be transmitted to another conductor insulated from it and cause a current to flow in the second conductor. This fact is made use of in the transformer when a current, flowing through the primary coils, induces a current in the secondary coils. This same effect can be produced in the second coil by interrupting a direct current passing through the first coil. Thus, we find that in order to have induction, it is not necessary to have an alternating current, but merely one that fluctuates; that is, one whose current and voltage values are constantly changing. For instance, if you have a grounded wire on a d.c circuit in an underground cable, or concealed in trunking where it is not very handy to get at, in order to locate this ground you would take one of the old type exploring coils and insert an interrupter, such as a common doorbell or buzzer, in this circuit. This would cause induction that could be easily picked up with the exploring coil and traced by carrying the coil parallel with the cable until the short was reached, at which time the fluctuations in this exploring coil would cease and you would know that you had found the particular spot where the short was.

The point is that the buzzer or interrupter in this circuit is analogous to the arc in the ground of our feeder, trolley wire or d.c. wires which may be found bare in trees or leaking through defective insulators to poles and then to ground. This sets up an oscillating current of a high frequency which travels along the line for a considerable distance and is a disturbance to radio sets which lie within 1,500 ft.

This arcing condition is not necessarily constant, but is more or less intermittent, and in most cases which have come within our experiences is aggravated by the presence of cars in the vicinity of the arc. This may be due to vibrations in the overhead construction or to the increased power consumed by the cars. Many times we find that it is worse when several cars travel close together or cars are pulling up grade rather than down.

Noises broadcast from the moving car we have termed "trolley pick-up." That may be a local expression, but, nevertheless, it serves the purpose of defining this particular type of noise. We have found this "trolley pick-up" due to three different causes.

First, we found that the moving car, drawing power, would be heard in the set while approaching several blocks away with a continual "crackling" noise. This noise would immediately cease as soon as the controller was thrown off and would start again with the application of power. This is affected by the type of roadbed and the amount of topsoil of this roadbed being tracked onto the rail by other vehicles. This tends to act as an insulation and causes the interruption of the return from the wheel to rail, causing an invisible arc which broadcasts. The same type of noise is also broadcast when several open bonds are in a given section.

Second, we have the "crackling" noise, as stated before, with approaching car under the same condition, but added to that "crackling" noise will be the hum of the motor pick-up from a low pitch to a high pitch, gradually ascending to a peak, and will stop immediately with the shutting off of power. This we find is caused by the combination of accumulation of dirt on rail with arcing brushes and poor rail bonding.

Depends on Type of Car

Third, when an approaching car is heard with just the pick-up hum of the motor or commutator, from a low noise, gradually ascending to a peak as the car gathers headway and no serious "crackling" with it. We found this type of noise to be confined to certain cars. All cars do not broadcast in this manner. Some of the older type of cars seem to give the most trouble.

To date we have not made any specific tests to remedy this type of trouble which we term "trolley pick-up." We believe the only remedy for this would be to equip the cars with condensers or some special apparatus made for that purpose.

We have had only 76 radio complaints to date and feel very proud of this fact in view of the large number of radio complaints received by the local lighting companies which also cover the territory. Of the 76 complaints investigated, we found that 40 per cent were due to leaking insulators and bare feed wire in trees, 25 per cent leaking caps and cones, 20 per cent trolley pick-up, 5 per cent local lighting companies and 10 per cent in owners' sets. You will note the very low percentage of set troubles found. This is because the local lighting companies receive most of the complaints of this nature and they have the trouble cleared up before the complaint reaches us.

Too much care cannot be exercised in

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[*] Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

the selection of the man for this type of work. He must have at his command more than a technical knowledge of the situation. He must keep in mind, first and foremost, that he is building good will for his company through these relations and must be able to handle the public in a diplomatic and patient manner. He must be electrically inclined, with a good sound working knowledge of radio principles, and must be thorough and sincere.

Accidental and Intentional Radio Interference*

By E. F. Bickford
Electrical Engineer Eastern Massachusetts Street Railway

Sources of radio interference seem to be disruptive discharges of two sorts: (1) Accidental, such as are produced by sparking commutators and the many types of leaks or grounds and circuit interruptions, where characteristic "spark phenomena" are produced. These seem to consist principally of grounds on feeder wires in trees, broken rail bonds, defective contacts for automatic electric track switches and signals, and (2) intentional, such as the various kinds of vibrating contacts and rotating devices used for interrupting circuits according to some design or plan, such as sign flashers, automatic heating pads, mechanical storage battery chargers, ignition systems, electric auxiliaries to oil heating plants, etc.

In either case, these disruptive discharges may not only send out direct radiation, but may also cause high frequency current to be propagated along the connecting wires of the circuits, and they may set up oscillations in parts of connected circuits, which will radiate in the same way as an antenna. Extensive tests made by the American Electric Railway Association would seem to indicate that so far as street railway operation is concerned the class of disruptive discharges referred to above as intentional will not have any effect at a distance greater than 50 ft., and in many cases this effect is limited to 20 ft. or less with loop sets.

The greatest amount of interference to radio reception in the above classes is caused by the interruption of small currents; that is, currents of such small intensity that their interruption causes sparks rather than arcs. Interference from the ordinary heavy current flows over wires and tracks, if the circuits are in good condition, should be negligible.

The operators of radio sets in the vicinity of our turnouts are able to detect by the sound in the receivers when automatic track switches are thrown or signals are lighted and when they are put out, and in view of the fact that the lights in the signals are highly visible at night, whereas other electrical disturbances are not as evident, the radio "fan" has immediately jumped to the conclusion that our signals were the cause of all his difficulty. The actual disturbance, however, due to the signal, itself, is of an instantaneous character and should not cause the radio operator any more disturbance than the ordinary switching on and off of the light circuits in his house, which is accepted as a matter of course.

The so-called disruptive discharges under the head of accidental are, of course, avoidable or subject to immediate remedy. As soon as any defects in our system come to our attention, whether it is signals, arcing motors, trolley wheels or tree grounds, broken bonds, etc., they are immediately corrected, and if we are maintaining our equipment in a reasonably good condition it is then strictly up to the radio fan to put in a type of apparatus and to so install, maintain and operate it that it will give him the quality of service he feels entitled to.

At a recent conference with a representative of one of the larger local lighting companies I was advised that its investigations disclosed that most of the sources of complaints originated on the premises of the complainant, either in his local house wiring or in his radio outfit or in the various household electric utilities, the final remedy for which was strictly up to the property owner or the owner of the radio set.

One of the principal causes of trouble to the radio fan is the lack of precaution on his own part to use proper equipment and see that the same is installed in such a manner as to give him the greatest freedom from outside interference. Some of the older types of radio outfits, often referred to as "squeal sets," used generally for long-distance work, not only cause disturbances to themselves and their neighbors, but they are very sensitive to any disturbances, particularly as most of these sets are operated with head receivers.

Recently many people have tried with more or less success to increase their distance by using some form of "superhet," either factory made or of home construction. It is stated that less than 20 per cent of the attempts to construct this type of set result in satisfaction to the builder, principally on account of noise and interference, which cannot be cleared up, primarily originating in the set, but in part due to greater sensitiveness.

Where a broadcast listener attempts, through highly oscillating systems and extremely sensitive sets and an extensive outdoor antenna, to obtain great distance, he must expect to receive a much greater amount of noise and interference from the operations of other radio "fans," modern electric household devices and from the legitimate operations of the public utilities, who are giving a public service through their distributing circuits.

All complaints received are investigated and if we find anything wrong with our system it is promptly remedied, but in case we find nothing wrong or if nothing we can do clears up the situation, we advise the radio "fan" to that effect, and expect him to make such changes in his equipment as he may see fit to remedy the situation.

We keep notes on complaints received from the various divisions and we are often able to eliminate this company's responsibility entirely. For instance, if we have a complaint and at the same time we can find other persons who are in the same location who are having no trouble whatever, it is quite clear that the difficulty is not due to the public utilities or the broadcasting station, but is probably due entirely to the equipment of the complainant. I believe a large part of the difficulties now encountered, particularly with modern sets, is because the manufacturers, to please the general radio public, have reduced the controls to such an extent that the "fan" is often unable to make necessary adjustments in his equipment which would eliminate the difficulty.

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*Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

C.E.R.A. Delegates to Travel by Boat

The good ship *South American*, of the Chicago, Duluth & Georgian Bay Transit Company, is scheduled to leave Chicago on her first trip of the 1927 season on Saturday afternoon, June 25. After making her usual stop of several hours on Sunday morning at Mackinac and at Perry Sound in Georgian Bay on Monday, she is scheduled to reach Detroit about 9 o'clock on the morning of Tuesday, June 28. This will be just one day in advance of the Central Electric Railway Association convention, which begins on June 29 at Detroit. A number of delegates from Chicago and vicinity are planning to travel to the convention by this ship, familiar to all members of the association from previous cruises.

Development of Electric Car

In a paper given before the Birney Club, St. Louis, on May 2, 1927, A. D. McWhorter, general superintendent Memphis Street Railway, outlined the development of car bodies from the time of the early horse-drawn vehicles up to the present.

In speaking of the use of steel car bodies, Mr. McWhorter said that the introduction of steel was not accomplished without serious opposition. First from those who were directly interested in the manufacture of wooden cars, and second, from those who were skeptical as to the advisability of adopting steel as a vehicle of transportation exposed to the action of injurious elements which might cause a rapid deterioration of the metal and a constant reduction of strength. Up to the present time no serious deterioration or reduction in strength has been noticed in the steel cars now in service. If proper attention is given to the method of construction, to the weight of metal used and to painting all parts thoroughly at the time of manufacture to protect them from corrosion, it is reasonable to expect an average length of service of at least 20 to 30 years from steel car bodies.

The latest development in cars provides for low-level entrance and exit, light weight, double trucks, a semi-noiseless construction and various refinements incorporated to provide comfort, convenience and safety to passengers. Comfortable and in many instances upholstered seats provide a measure of luxurious travel comparable to that afforded by the automobile; high candlepower lights also add to the pleasing appearance. Probably the most important part of present-day electric car operation is that of making car riding more popular by providing more attractive and comfortable transportation.

Efforts to Reduce Radio Interference Successful at Concord*

By J. B. Crawford
General Superintendent Concord Electric Railways

In our experiences for the past few years with reference to radio interference the greatest difficulty we have found has been separating the wheat from the chaff. In other words, about 90 per cent of the radio troubles for which we have been blamed should not have been laid at our door.

During the winter of 1925 and 1926 radio reception was very poor and consequently irritating to the radio fans. The international transatlantic test scheduled for the last week in January was a complete failure. Static had seldom been worse. The telegraph companies reported an unusual number of natural electrical disturbances that at times put their long-distance lines out of commission. Some of this was blamed, with much plausibility, on the northern lights, which were unusually active that winter. No less an authority than W. D. Tyrrell, chief radio supervisor of the Department of Commerce, says that radio conditions were worse that winter than any winter since radio began. Mr. Tyrrell states that the real cause of these disturbances was sun spots. During January and February, he goes on to say, "several of these great spots, each of them large enough to engulf a dozen earths, could be seen on the sun's face with the naked eye. Still others were visible with telescopes." Mr. Tyrrell believes that this condition will probably continue for a year or two.

In Concord, as in other cities, the condition of apparent radio interference became so pronounced that a radio club was organized, and shortly after two experts were sent there by one of the radio manufacturing companies to assist in locating the troubles. Three autos, a large number of interested fans and radio dealers scoured the city in an effort to locate the elusive radio bug. This test was so unproductive that even the newspapers made fun of it, as witnessed by the following account:

"The trip included the various points of the city, but nothing definite was said concerning any discoveries. There seemed to be a vague aura of mystery surrounding everything. Typical of the testing is the following: Motor cars run up to a place, come to a stop. Business of general exodus from the cars. The portable set is carried to some point in the vicinity while everybody gathers around. The buzz is unmistakable.

First Man—"Sounds like the real thing."

Second Man—"That's just a natural disturbance from the motors."

Fourth Man—"Hear the little wave —ooom-ooom—like that?"

Fifth Man—"Sure. What is it?"

Fourth Man—"That's it."

Third Man—"It's local disturbance."

Sixth Man—"That's just the engineer inside shifting from one motor to another."

Second Man—"Hey, Charlie, what do you think of Northern Lights? Do they have any effect on radio?"

Seventh Man—"Possibly, but that doesn't cause this kind of disturbance."

First Man—"What would you say is the matter here?"

Fourth Man—"Oh, this is partly a local disturbance. The commutator and the carburetor probably set up an arc which sends out radio frequency waves. It's d.c., all right."

Reporter — "Just what does that mean?"

Fourth Man— "Not much."

Reporter—"But there is something that is causing a general disturbance?"

Fourth Man—"Oh, yes, indeed."

First Man—"Let's move down the road away and try it."

Everybody moves.

"When the survey is complete it is expected that it will be but a short while after that the noise which has been the bugbear of Concord radio fans will be eliminated."

It is my belief that most street railways are making every possible effort to eliminate causes of radio interference. At first it seemed rather a hopeless task. During the winter referred to we were very diligent in running down all troubles of this nature brought to our attention. In fact, we started in the fall of 1925 testing all rail bonds and replacing them with welded bonds where they failed to meet a selected standard. All trolley wires and feeders were cleared of ground leaks and poor connections. The high-tension lines were closely watched and all leaking insulators were immediately replaced. Graphite brushes were installed on our older rotary converters. In spite of all this, we still frequently have troubles causing real radio interference but difficult to locate.

Once we had a very bad a.c. disturbance which was finally located in an isolated transformer house. Some one had broken in during the summer months when the transformers there were not being used and had thrown in one switch of a three-phase circuit, thereby causing a current to jump across a telltale that had been installed to give information as to whether or not all three phases were working. This created a terrific roar. Of course the trouble was rectified immediately and there has been no trace of any disturbance from this source since.

Last fall we had a case of interference that was not so easy to locate. By a series of tests we eventually found the disturbance to be originating in a modern 500-kw. rotary converter. The armature of this converter had burned out last spring and been rewound. The machine was in excellent running condition with almost perfect commutation and we were unable to discover what was causing the disturbance. Therefore, we called on the manufacturer. He sent us one of his service men, who was also familiar with radio troubles and who finally located this noise. He found that by touching a grounded wire to the rotating shaft of the machine the interference was stopped. A copper leaf brush was rigged up and connected to ground through the frame. It was placed so as to touch the rotating shaft at all times. This has been an absolute remedy for the trouble and no further complaints have been made. The theory advanced by the engineer was that in some obscure manner a potential was built up in the rotating shaft. This potential increased until it reached a point where it could break through the oil film of the bearing and discharge to ground. This condenser action produced oscillations of radio frequency which were impressed on the windings of the machine and so transmitted over the system.

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*Abstract of a discussion presented before the New England Street Railway Club, Boston, Mass., May 12, 1927.

Electrical Engineers Elect Officers

Bancroft Gherardi, vice-president and chief engineer American Telephone & Telegraph Company, New York City, was elected president of the American Institute of Electrical Engineers at the annual business meeting held in the Engineering Societies Building, New York, on Friday, May 20. Other officers elected were: Vice-presidents: J. L. Beaver, Bethlehem, Pa.; C. O. Bickelhaupt, Atlanta, Ga.; O. J. Ferguson, Lincoln, Neb.; E. R. Northmore, Los Angeles, Cal.; A. B. Cooper, Toronto, Ont. Managers: F. C. Hanker, East Pittsburgh, Pa.; H. P. Liversidge, Philadelphia, Pa.; E. B. Meyer, Newark, N. J. National treasurer, George A. Hamilton, Elizabeth, N. J. (re-elected).

These officers, together with the following hold-over officers, will constitute the board of directors for the next administrative year, beginning Aug. 1: C. C. Chesney, Pittsfield, Mass.; M. T. Pupin, New York City; H. M. Hobart, Schenectady, N. Y.; B. G. Jamieson, Chicago, Ill.; George L. Knight, Brooklyn, N. Y.; H. H. Schoolfield, Portland, Ore.; A. E. Bettis, Kansas City, Mo., John B. Whitehead, Baltimore, Md.; J. M. Bryant, Austin, Tex.; E. B. Merriam, Schenectady, N. Y.; M. M. Fowler, Chicago, Ill.; H. A. Kidder, New York City; E. C. Stone, Pittsburgh, Pa. I. E. Moultrop, Boston, Mass.; H. C. Don Carlos, Toronto, Ont.; F. J. Chesterman, Pittsburgh, Pa.

The annual report of the board of directors, presented at the meeting, showed a net increase in the member during the year of 186, the total membership on April 30 being 18,344. In addition to the three national conventions of the institute and five regional meetings, there were 1,273 meetings held by the local organizations.

American Association News

Committee on Bus Operation

AN ANALYSIS of the progress made on sub-committee reports and to a discussion of the basis of bus fares occupied a large part of the time during a meeting of the committee on bus operation, held at association headquarters in New York on May 23. The following members were present: Paul E. Wilson, sponsor; A. R. Meyers, sponsor; C. H. Chapman, S. W. Greenland, and Adrian Hughes, Jr.

There was some difference of opinion as to whether bus rates should be established so that the costs of operation would be borne directly by those using the service or whether it should be merged with the total cost of transportation in the city and carried by the system as a whole.

Mr. Wilson was of the opinion that the situation regarding the proper basis for bus fares is rapidly changing and that a new conception of this matter should be brought out. He held that bus rates when originally established were designed to meet emergency conditions; that they were not fixed by the economics of operation but by the exigencies of the conditions encountered, such as the threat of competition and the general lack of knowledge regarding operating costs. He held, further, that the very flexibility of the bus increases the pressure which is exerted for extension, and that unless bus operation is put on a sound economic basis, where at least a large part of the service will stand on its own feet financially, there is danger of burdening any given company with a constantly growing financial load that tends toward a general rise in the fare level. He did not consider it fair to burden the established car rider whose place of residence and business were selected so as to be convenient to existing transportation facilities with the cost of establishing new transportation to undeveloped communities where property values are considerably lower.

Mr. Hughes was of the opinion that any effort to establish new bus routes on a basis to make them carry entirely the costs of operation was impracticable. He felt that the extension of service by buses is part of a given company's responsibility to render a complete service to its community and considered that the extension of service by buses is comparable to the extension of rail service, and costs should be carried in the uniform fare.

Other members of the committee joined in the discussion of various angles of this subject and it was felt by the committee that the inclusion of such a fundamental discussion in its report would be timely and of great value to the industry. Mr. Wilson asked Mr. Hughes to outline his views on the subject in writing in order that they may be available in the preparation of the report.

Way and Structures

A FINAL meeting of the way and structures committee will be held on June 9 and 10 at A.E.R.A. headquarters, New York City, at 10:30 a.m., Eastern daylight saving time. Chairmen of all special committees are invited to attend this meeting. The importance of having as many reports as possible in shape for submission at that time is urged upon each chairman.

New Engineering Manual Out

THE second republication of the Manual of the American Electric Railway Engineering Association in bound-book form has just been sent out. This is revised to Dec. 31, 1926, and follows the general arrangement of the 1923 edition in bound-book form. Previous to 1923 the Manual was published as a loose-leaf volume.

Material is grouped into eight general divisions which follow the principal phases of the Engineering Association's work and in each division the manual sections are classified according to three grades: standards, recommendations, and miscellaneous methods and practices. The title page and table of contents is divided so as to make each division complete in itself. Each division is published separately.

Under the system put into effect in 1923 the manual is completely republished in bound-book form at the end of every three-year period. Any new sections which may be approved in the two years immediately following such republication are printed in full in the supplements of these years.

Co-operation with Manufacturers

A MEETING of the committee on co-operation with manufacturers was held at association headquarters in New York on May 13, 1927. The following members were present; E. F. Wickwire, chairman; M. B. Lambert, vice-chairman; F. L. Blanchard, Mr. McCormick representing H. B. Doyle, George Frey, Mr. Bodine representing H. J. Kenfield, G. R. Rowland, L. F. Stoll and E. P. Waller. J. W. Welsh and Labert St. Clair of the association staff also attended the meeting.

The chairman reported the figures on the distribution of the traffic congestion booklet, and after discussion it was decided to send another follow-up letter, each member co-operating by sending out a letter to an assigned list of names. The advertising section was authorized to offer manufacturer members two posters and two stickers which have been prepared for use on freight and express packages. Other posters and stickers dealing with safety and traffic congestion were approved.

It was decided to issue two booklets some time before the annual convention, one of which will deal with the influence that modernized equipment, courtesy and other details have on the sale of car rides. The other will be written for salesmen in the industry to show how they can be helpful to operators in the way of getting business. The advertising section will also be requested to prepare some interviews for the use of salesmen on the general local transportation situation throughout the country.

The committee plans to make a special effort before and at the convention to interest visitors in the electric car exhibit. All manufacturer members will be asked to visit the car exhibit and to take visitors with them. In addition, editors of trade papers will be asked to run editorials prior to the convention urging every one to visit the car exhibit.

Special Reports in Preparation

FOLLOWING is a list of special reports being prepared by the Bureau of Information and Service of the American Electric Railway Association. They will be available to member companies upon request:

Bulletin No. 138.—*Electric Railway Operations,* 1926.—Contains a combined statement of the revenues, expenses, net revenue, passenger traffic and car miles operated of 353 electric railways and 138 affiliated bus undertakings in 1926 compared with 1925. It also gives a complete comparative income statement and analysis of operations of 231 railway companies, classified into city, interurban and combination city and interurban companies and each group is further classified into three smaller groups according to the size of the companies. For each group there is shown a complete income statement, detailed operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 139.—*Bus Operations of Electric Railways in* 1926.—A summary and analysis of the bus operations of 135 electric railways. The reports of the individual companies are tabulated, and certain of the more important items are shown on a unit basis to permit a more accurate comparison. The reports tabulated include a complete income statement, details of operating expenses, statistics of operations and complete data on the number, types and seating capacities of buses operated.

Bulletin No. 140.—*Promotion of Safety by Awards to Trainmen.*—A study of the methods adopted by various companies to promote safety by means of the payment of a bonus, or the granting of some other award or distinction, to trainmen for good accident records. All of the methods adopted for this purpose have been examined and classified into certain types, and a complete list of companies that have established systems of awards to trainmen has been prepared and classified under the several types of awards. A complete description of the system in effect on each property is also given, together with statistics on their accident records to indicate what, if any, effect the system of awards has had upon the number and cost of their accidents. There is also included expressions of opinion by executives as to the value of award systems on their respective properties.

Bulletin No. 141.—*Miscellaneous Factors Affecting the Working Conditions of Electric Railway Trainmen.*—A compilation of information covering a number of miscellaneous provisions, such as insurance and sick benefits provided, period of training required for motormen, conductors and one-man car operators, pay received during period of training, number of trainmen, total payroll and labor turnover in 1926 and also the proportion of trainmen belonging to the union.

Bulletin No. 142.—*Miscellaneous Factors Affecting the Working Conditions of Electric Railway Bus Men.*—Gives for bus operations of some 132 companies the same information regarding life insurance, sick benefits, period of training required, pay received during training and statistics of employees, as is given for electric railway trainmen in Bulletin No. 141.

In addition to the above the following supplements have been prepared, bringing the information they cover down to May 1:

Supplement No. 20 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 2 to Bulletin No. 129, Wages of Trainmen.

Supplement No. 2 to Bulletin No. 130, Wages of Bus Men.

Cost of Living Studies (Bulletin No. 143).

The News of the Industry

Pennsylvania's Newark Plans Announced

Mayor Thomas L. Raymond of Newark, N. J., received on May 24 the Pennsylvania Railroad's plans for its proposed improvements in that city. These include the construction of a new passenger station on the north side of the Pennsylvania Railroad tracks between Market and Canal Streets. Upon the completion of these new facilities Manhattan Transfer will be abandoned. The railroad agrees to make these improvements in connection with arrangements between the city and Public Service Corporation, providing adequate transit facilities.

The western half of the Pennsylvania's new station will be used by passengers for local and main line trains and the eastern part will be used by passengers for the rapid transit service to Jersey City and downtown New York, provided jointly by the Pennsylvania and the Hudson & Manhattan.

The station will be served by eight tracks, six for Pennsylvania Railroad trains and two for the rapid transit trains. There will be six platforms. Seven of the tracks and five of the platforms will be placed approximately at the level of the present tracks, and one track and one large platform will be constructed about 18 ft. above the present track level. This upper track will be used by westbound rapid transit trains. The unloading platform will be 50 ft. wide, to accommodate the large number of passengers arriving from downtown New York. Two ramps will lead from this platform to the street level and other ramps will descend to the westbound main line island platform immediately below. This will provide easy access to the proper platform for westbound Pennsylvania Railroad passengers.

The main station area, including the new building on the north side of the elevated railroad, will extend under the tracks and platforms.

$250,000,000 of Property Involved in California Rate Cases

The California Railroad Commission now has pending before it an extraordinary number of important proceedings relating to service and rate conditions on transportation utilities in California, and especially those involving local and interurban transportation in the larger cities. In this respect the state body is confronted with serious problems of this nature in every large city of the state, and the value of the railroad properties involved totals upward of $250,000,000.

As a result the commission has decided to investigate the manner in which cities in other states, and their transportation utilities, have met these problems and has directed A. G. Mott, its chief engineer, to go East for the purpose of studying these and other important public utility matters. Mr. Mott left on this mission on May 23 for an extensive tour and is expected to return during the first week of July.

The chief engineer will study the local transportation conditions in all of the cities that he visits. He will also study steam railroad freight and passenger terminal situations in such cities as Chicago, Washington, Philadelphia and New York.

Under instructions of the commission, Mr. Mott will also inquire about the practices and service of some of the more important electric power utilities.

Among the major transportation cases pending before the Railroad Commission at this time are the applications for rate and fare increases on the Key System Transit Company, Pacific Electric Railway, Los Angeles Railway, San Jose Railroad, Peninsular Railway, Sacramento Street Railway and Stockton Electric Railway.

Unification Inquiry Under Way

Commission Starts Public Hearings After Failure of Private Conferences—Counsel for State Body and Head of Brooklyn Corporation in Disagreement Over Reasons for Failure of Negotiations

NEW YORK'S new transit inquiry has got under way. As was to be expected, Samuel Untermyer, special counsel for the Transit Commission, has succeeded in making first page news out of the proceedings not so much by what has been brought out as by the way it has been brought out.

The inquiry, of course, purports to be a fact-finding proceeding on the part of the commission, conducted in open form fashion for the purpose, apparently now submerged, of discovering ways toward traction unification. It has been ushered in with the obviously irrelevant question of the ownership of stock of the Interborough Rapid Transit Company and comments from counsel on the stock as a football of speculation.

For thus diverting attention from the main issue Mr. Untermyer has been called to account in the daily press, the *Wall Street Journal* asking where else than in Wall Street any one would expect to find the stock. As that authority sees it, the stock is not an investment and has not been one since the company took over the bankrupt Metropolitan Street Railway nearly a score of years ago. It says that investors long ago took their losses and retired from an enterprise which, after brilliant entrance into its own field of long-distance transportation, had sadly blundered in its first plunge into "unification." It says:

> Certainly Mr. Untermyer does not harbor the delusion that either the ownership or the market price of the stock can have anything to do with the terms on which the city may or may not take over the company's property. But the divertissement with which the play opens is far from a waste of time, from Mr. Untermyer's point of view. It creates the invaluable atmosphere, or haze, through which the public may see the traction Caliban struggling desperately to free itself from Ariel's magic spell. Facts really bearing upon efficient transportation service, the value of the properties and the expediency of recapture can, if necessary, be brought upon the stage in the fifth act.

The almost unending details seem to have no place, certainly at this time, in an account such as this. But what is it all about? Well, the gist of the matter is that the Transit Commission has begun the series of public hearings in the hope of obtaining information and suggestions which will assist it in drafting a plan for the unification of the rapid-transit facilities of New York City. It is required by law to prepare such a plan. In advance of its public hearings it undertook to reach some basis of understanding with the companies by a series of private conferences. These were barren of results and served only to emphasize the many points of difference in the views of the negotiators.

The only possible relevancy of the questions of counsel with respect to ownership and stock values is that the latter is said to have been the chief obstacle to progress at the recent conferences. As has been pointed out, the task is made doubly difficult by the fact that any plan which is finally devised much be accepted by both the companies and the city. The commission is a state-created body, with no power in this case other than to investigate and to recommend. As the *World* sees it, unification cannot be effected through its agency unless all parties show a disposition to give and take; nor can it be accomplished if the transit question is again to be bedeviled with politics as it was under the Hylan régime. "The job, in short, cannot be done unless there is a vigorous display of common sense all around."

Announcement to this effect that the private conferences had failed was made on May 11 by Mr. Untermyer. He declared that the Interborough wanted the city to take over the Manhattan elevated lines, which it holds on a lease, but which do not pay, and that the B.-M.T. expressed its willingness to dispose of its surface lines to the municipality but wanted a guarantee of its earnings in perpetuity. Mr. Untermyer intimated that the companies were unreasonable in their demands. Recapture seemed to be the only answer, he said, if the companies remained in their present mood.

Gerhard M. Dahl, chairman of the board of directors of the Brooklyn-Manhattan Transit Corporation, said in reply that the negotiations between the B.-M.T. representatives and the special counsel of the Transit Commission were terminated by the latter. According to Mr. Dahl no valuations by the Transit Commission where shown or offered, nor was any plan suggested, excepting a determination to split up the B.-M.T. properties in order that the city might purchase such part as it might choose at some knock-down price not stated, without any intimation as to how or when the city could pay even for that. Mr. Dahl said:

> The function of the Transit Commission, as set forth in the law enabling it to act, and as again emphasized in its public letter of Dec. 13, 1926, namely, to formulate a plan for the unification of all transportation systems with a fair return to the companies and a fair return upon the city funds invested, was at no time permitted by counsel for the Transit Commission to enter the discussion.
>
> The B.-M.T. is now and always has been willing and anxious to do all in its power for the improvement of the transportation facilities of the city. There is, however, little encouragement in prospect so long as those acting for the Transit Commission refuse to consider real unification or feasible methods to improve the service or a fair return upon the fair value of the investments in the property, both by the companies and by the city.
>
> We have been at all times and are now willing to agree upon a fair value of our property and a fair rate of return upon that value regardless of securities issued or stocks outstanding and market or any other values.

At least one witness has proved refractory about answering questions deemed to be irrelevant, and on May 26 the authoritative statement was made that the commission and its special counsel will make a test case out of Thomas L. Chadbourne's refusal to answer. On advice of counsel Mr. Chadbourne declined to answer questions relative to details of his purchase of Interborough stock. He wants to go to Europe, and for that reason was called as a witness out of the scheduled order of the inquiry. If the commission decides to test his right of refusal while he is away, service will be made by agreement on his counsel.

All in all, the first week's hearings have developed little bearing on the central purpose of unification. It is, however, generally agreed, as the *Times* points out, that they have served to bring out one rather significant declaration. It has been widely believed that the companies' attitude toward valuation would be rather unbending, particularly in the light of recent court decisions stressing reproduction costs as the principal criterion of value. But ex-Governor Miller, counsel for the railway, at the outset made it clear that the B.-M.T., at any rate, had no preconceived notions on the subject and would listen to reason. He declared that his client would even be willing to submit to arbitration to secure a proper determination of the matter. That may have been a gesture, but at least it was a gesture in the right direction, for agreement on a valuation of the companies' properties offers one of the principal difficulties in the present negotiations.

Meanwhile, the hearings have been put over until May 31.

Fare Hearings in St. Louis Started—Valuation Case Deferred

The hearing on the application of Receiver Rolla Wells of the United Railways, St. Louis, Mo., for a flat 8-cent fare opened before the Missouri Public Service Commission at Jefferson City on May 17. City Counselor Muench has indicated a desire to present his testimony at a hearing later.

Before any testimony was offered Mr. Muench asked that the commission make it clear whether the matter would be confined merely to a question of the rate to be allowed the company or if the entire subject of valuation would be again discussed. He said that the city opposed a new valuation as one was practically completed in 1923 and the car riders of St. Louis should not be subjected to the great expense of a new valuation. It was his contention that the logical way to proceed to a basis on which to predicate a new fare was to take the 1919 valuation of $51,781,000 and add betterments and additions made since that time.

Thomas E. Francis, counsel for Mr. Wells, said that the fare application was not presented nor urged on the valuation theory, but is predicated upon the view that an 8-cent rate is necessary to earn a fair return upon the money invested, pay taxes and operating expenses.

Among the early witnesses presented by the company were W. B. Bennett, consulting engineer for the company; Albert S. Richey, Worcester, Mass., and Robert M. Fuestel, Fort Wayne, Ind., engineer and operator of public utilities. These witnesses testified as to the present physical condition of the company's properties so that the units established by the 1919 valuation might be used as a basis for establishing the worth of the property as at present.

The theory on which the company is building up its testimony is that the commission in conformity to a recent decision of the United States Supreme Court should allow the utility to earn on the basis of the reproduction cost of its properties new less depreciation. A maximum valuation claim of $100,000,000 less depreciation of 16 to 20 per cent would bring the value of holdings, exclusive of non-operating properties, to not less than $84,000,000. However, it does not expect the commission to allow this maximum figure and would be content with a valuation of $75,000,000 as basis for figuring rate of return. Its application to the commission contended that the fair valuation of its operating properties was $75,000,000 and that was the figure used when the fare question was before the federal courts a few months ago. It is $15,000,000 more than the reorganization committee has stated it would accept if the city would grant a new franchise to it.

On May 16 accountants for the Public Service Commission completed an audit of the betterments and additions made during the last two months of 1926. It brings the total since Jan. 1, 1919, to $6,425,943. Depreciation for this period was estimated at $8,469,729, being subdivided as follows: Way and structures, $4,064,376; power and plant, $910,643; equipment, $3,480,517; bus equipment, $14,201.

Recently the commission appraised the property at $58,177,260.

Electrification Plans of New York Central Divulged

The New York Central Railroad will develop power in its own generating stations at Yonkers and Port Morris to supply its contemplated electrification on the west side of Manhattan Island, according to statements made by railroad officials to the press. Between 30,000 kw. and 40,000 kw. will be required for track now being electrified between Spuyten Duyvil and 72d Street. Plans for electrifications below 72d Street are still under discussion.

At the present time the New York Central has two power stations in the New York district. The largest of these is at Port Morris, in the Bronx. Here 70,000 kw. can be generated, and the major portion of the energy needed for the passenger lines of the company running north out of the Grand Central Station is supplied from this station. The second power station of the company is at Yonkers, where there is a capacity of 20,000 kw. This plant will be doubled, the new equipment being added probably within two years.

The railroad does not, it is announced, expect to purchase any power from the local companies for any part of its extensive electrification program. Current will be fed to the lines of the railroad on the west side from three substations, each with a capacity of 5,000 kw. These stations will change the current from 11,000 volts alternating to 600 volts direct. One of these substations will be at Dyckman Street, another at 133d Street and a third at 66th Street.

The electrification of the west side line of the New York Central has been the subject of negotiation between the railroad and the city for a long time. In the present instance the work is being combined with the elimination of numerous grade crossings.

New York State Men Vote Against Wage Renewal

Employees of the New York State Railways in Utica, Rochester and Syracuse in joint balloting on May 25 voted down by a majority of 133 the proposal to renew the existing wage and working agreement with the company. Bargaining was resumed between James F. Hamilton, president of the railway, and union officials. Another vote may be taken on the same proposal before resorting to arbitration. The employees voted twice last year on the same proposition before accepting it. It was stated that the vote in Rochester favored renewing the present contract, while Utica and Syracuse, where fares have been increased to 10 cents, cast the ballots that led to its defeat.

The present wage scale is 55 cents for two-man car operators, 58 cents for one-man operators and 60 cents for interurban men. The men had asked for a 9-cent an hour straight increase. The company contends employment conditions and high cost of maintenance preclude any wage increase.

Chicago Rapid Transit Employees Renew Wage Demand

Hearings on the question of a wage increase of 15 cents an hour for 5,000 employees of the Chicago Rapid Transit Company were scheduled to begin this week, following presentation of a formal demand to officials of the company by Frank E. Lawrence, president of the Chicago elevated division of the Amalgamated Association. The present wage ranges from 72 to 77 cents an hour under an agreement which expires May 31. Although official announcements have not been made, it is understood that the company, instead of entertaining the demands of the union, will seek a reduction in wages and will also negotiate for changes in working conditions.

Similar demands upon the Chicago Surface Lines are momentarily expected from 15,000 platform and other employees. Since June 1, 1926, the Surface Lines employees have been working without a contract, as they failed to reach an agreement with the company at that time, when, together with the elevated workers, they demanded an increase of 5 cents an hour.

Survey Recommends Changes in Birmingham Traffic

Recommendations looking toward a solution of the traffic ills in Birmingham, Ala., have been forwarded to the City Commissioners as a result of an intensive survey conducted by Ross W. Harris.

Among the changes sanctioned by the city commissioners was a complete rerouting of car lines of the Birmingham Electric Company so as to distribute more evenly the loads carried by certain streets, prohibition of any parking on Second Avenue from Eighteenth to 21st, and the abandonment of Avenue C and Terminal station. The date when these changes are to go into effect has not been settled, but the commission plans to set a "zero hour" when all changes will be made on a certain day. Ordinances providing for the changes have already been drafted by Mr. Harris and City Attorney W. J. Wynn and submitted to J. M. Jones, Jr., president of the City Commission.

J. S. Pevear, vice-president and operating head of the Birmingham Electric Company, said that orders for new track, curves and other necessary facilities for carrying out the utility's part of the suggestions had been placed. The work of placing trackage to facilitate the rerouting will begin as soon as the orders are filled.

Commission Hopes for Adjustment in Buffalo

Under a plan advanced at Buffalo, N. Y., the Public Service Commission will consider not only the fare question, but track reconstruction and other matters in the transit situation over which there have been differences of opinion between the International Railway and the city. It is understood that after a program has been prepared, the commission will submit its proposal to the city and company for criticism. If overtures to act as arbiter in the matter are rejected, it is said that the commission will render a decision itself.

It is pointed out that not only must the commission consider the fare case by itself, but that it must view all angles of the situation. These include the city's application for an order to reconstruct many miles of roadbed, the counter application of the company for a rehearing of the Grant Street case, inasmuch as the city has moved to revoke the franchise. A commentator said:

> In viewing the proposition as a whole, it is likely that the commission will insist upon a track reconstruction program. Whether this will involve an increased fare is uncertain. It depends upon additional studies being made of the company's financies by commission experts.
>
> It is probable that in taking a comprehensive view of the matter, the commission also will give thought to the company's application to abandon portions of certain car lines and to substitute buses.

Amended Fare Schedule in Los Angeles Authorized

In a supplemental order the California Railroad Commission has authorized the Pacific Electric Railway to amend on one day's notice its experimental rate schedule, now in force between Los Angeles and points on its Glendale-Burbank line, as follows:

1. Publish between Los Angeles and Cypress Street a 30-ride family commutation fare of $3.25.
2. Reduce the present 30-ride family commutation fare between Los Angeles and North Glendale from $4.80 to $4.50.
3. Publish between Los Angeles and Pacific Avenue a 30-ride family commutation fare of $4.50.
4. Publish between Los Angeles and Allen Avenue a one-way fare of 20 cents, round-trip fare 35 cents, and 30-ride family commutation fare of $4.80; between India Street and Allen Avenue a one-way fare of 15 cents, round-trip fare 25 cents, and 30-ride family commutation fare $3.60; between Richardson and Allen Avenue a one-way fare of 10 cents; between Glendale (East Broadway) and Allen Avenue a one-way fare of 10 cents, and between Arden Avenue and Allen Avenue a one-way fare of 6 cents.
5. Publish between Cypress Street and North Glendale and between Cypress Street and Hahne a one-way fare of 6 cents.
6. Eliminate from the tariff all one-way, round-trip, 30-ride and 60-ride fares now published between Los Angeles, India Street, Richardson, Glendale (Broadway) and Glendale (East Broadway) on the one hand, and on the other Senorita, and between Los Angeles and Western Avenue.

Aurora Line Publishes Booklet for Suburban Home Seekers

Advantages of a home in one of Chicago's many beautiful western suburbs and the convenience offered commuters by its high-speed electric train service are among the features set forth in an attractive pamphlet recently published by the Chicago, Aurora & Elgin Railroad, Aurora, Ill. Information regarding educational and religious institutions, shopping, banking and recreational facilities, public utility services in every community along the railroad is contained in the 23-page booklet, which is entitled "Facts About the Western Suburbs and the Fox River Valley." It is illustrated with numerous pictures of scenic points in that territory.

The booklet is addressed particularly to the city dweller who desires to make his living conditions better. It is being distributed through hotel information desks, newspaper service bureaus and at all stations of the railroad.

New York Interurban Satisfies Needs of "Fans"

Offering the baseball enthusiasts of Jamestown, N. Y., and adjacent communities an opportunity to witness some of the major league baseball games played in Cleveland, Ohio, at a special excursion rate of $3.75 for the round trip is one of the many moves of the Jamestown, Westfield & Northwestern Railroad to stimulate its revenue.

Several years ago this line operated its first Sunday excursion to the Ohio city. For the initial trip more than 2,000 persons purchased tickets. Similar excursions have been operated at regular intervals since and the company now makes a regular feature of these excursions during the early spring and summer months.

The Jamestown, Westfield & Northwestern has its northern terminus at Westfield, N. Y., where it connects with the main line of the New York Central Railroad. Every available car of the former is pressed into use on these feature excursions. On reaching Westfield the passengers are transferred to a special steam train on the Central tracks, whence they are transported to Cleveland, without further stops.

The regular one-way fare between the two cities via the route mentioned is $5.34. The cars are started out of Jamestown in the early hours of Sunday morning and the return trip is made late the same evening. Due to the low-peak hours the excursions are operated, there is little or no interference with regular passenger travel and even though the reduction in rate is exceptional, both the trolley line and the steam line are enabled to increase their revenues.

The first excursion of 1927, advertised in the local newspapers for several days preceding, was on May 15.

Settlement Sought by Company at London

The London Street Railway, London, Ont., has agreed to relay its tracks in London West with new steel rails on steel ties and a concrete foundation. It has also agreed to install a passing switch and a loop or a three part "Y" in a suitable location. The company's acquiescence in this matter is contingent upon the passage of the following by-laws by the City Council:

> (1) Amending by-lay 916, authorizing the 5-cent fare in place of the seven and nine tickets for 25 cents as provided under subsection D of section 25; (2) a by-law amending by-law 916, granting the right to the company to operate ten additional safety cars, or a total of fifteen safety cars, with one employee in place of using two employees on each motor car as provided for under subsection H of section 25; (3) a by-law covering relief from the cost of paving the track allowance as provided for under section 10 of by-law 916, except that the company pays for the cost of laying the concrete foundation under the ties up to the normal line of paving.

According to Manager L. Tait, immediately after the passing of the necessary by-laws and their acceptance by the company, orders will be placed with the steel companies for the steel rails, ties, and the special trackwork required and the work it is estimated can be started within five weeks after the placing of the orders for the materials.

Proposal for Use of Canal Bed in Newark

A definite proposal regarding the financial arrangements between the Public Service Railway and the city of Newark, N. J., for the use of the Morris Canal bed as a rapid transit line was contained in a letter written by T. N. McCarter, president of the railway, to Mayor Raymond and recently made public. Mr. McCarter suggests that the city at its own expense and at an estimated cost of $4,000,000 prepare the canal bed for its subway use and also erect under the proposed new Pennsylvania station an adequate and up-to-date terminal station with all the necessary equipment, including track space, platform and escalators. His plan stipulates that a lease be entered into with the Public Service Railway under which that company would pay to the city 5 per cent of the gross revenue derived from operation of the subway line. Besides, according to the letter, the Public Service Railway would be willing under this plan to expend approximately $850,000 for making the necessary connections to the existing Public Service line, equipping the subway structure when completed with rails and overhead construction for operation. It was further proposed that the railway would be willing to finance the $4,000,000 expenditure with the understanding that the annual carrying charges on that sum be deducted from the 5 per cent tax to be made to the city by the companies.

Mr. McCarter said that he was confident the development would increase the traffic, "resulting, therefore, in substantially increased payments to the city under the 5 per cent tax requirement, which extra payment will constitute the rental to the city for the privilege."

Justifies Ventilation System in Toronto

The Toronto Transportation Commission declared that its ventilating system can exhaust air faster than a throng of 3,600 people jammed in Massey Music Hall could breathe it out from their lungs. In the *Coupler*, under date of May, 1927, referring to the publicity given during the past month to the provincial health law limiting the number of passengers to be carried by a street car, the commission stated that when it realized that poor ventilation was a menace to Toronto's citizens more than $100,000 was spent installing efficient ventilating systems similar to those used in the new steel cars. When the commission took over the system six years ago and adopted the motto "Safety, Courtesy and Service" it was concluded that safety should not only include prevention against accidents but also against germs. Thus it was that every street car order was designed so as to provide the best of ventilation. The commission states that it makes no attempt to conceal that at times, particularly on rainy days, cars may have slightly unpleasant odors, emanating from the wet clothing of passengers. However, it claims, it would not be possible to arrange a ventilation system which would eliminate these odors.

News Notes

Rates Advanced.—The Arkansas Valley Interurban Railway, operating from Wichita to Hutchinson and Newton and serving intermediate points in Kansas, has been granted an increase in passenger rates by the Public Service Commission. The new rate, effectiv May 22, calls for 3.6 cents a mile instead of 3 cents. The interurban is now on the same basis in this respect as the steam roads.

Change in Ticket Fare in Danville.—The Danville Traction & Power Company, Danville, Va., has been denied the 8-cent fare which it recently sought. C. G. Holland, president of the company, asked for a franchise amendment to permit the corporation to raise the fare from 7 cents. As a compromise, however, the company is permitted to sell four tokens for 25 cents, instead of five for 30 cents, as at present.

Special Cars for Summer Outings.—The Reading Transit Company, Reading, Pa., has invited its patrons to prepare for their family outings in the summer months by transportation on the street cars. All the parks in Reading and vicinity that are especially popular with picnic parties are now being prepared for the public's use. Special service will be provided for summer picnics and the company urges all to fix the date in advance so as to avoid the likelihood of conflict with outings of other organizations.

Single Fare to Park for Summer.—The City Council of Fort William, Ont., has authorized the charging of a single fare to Chippewa Park for the summer to promote traffic on the park entension line of the Fort William Municipal Railway. An experiment was made with a single fare to the park in August, 1926, but it was not altogether successful, mainly on account of weather conditions. The Trades and Labor Council took the matter up for this year.

Would Sell Land.—The San Francisco, Napa & Calistoga Railway has applied to the California Railroad Commission for authority to sell a small parcel of land in the city of Vallejo, comprising a portion of its right-of-way abandoned for a new location.

Advances in Wages Approved.—Wage increases were approved by the City Council of Edmonton, Alta., for the motormen-conductors of the Edmonton Radial Railway. They became operative as of April 1. The commissioners' report stated that the change involved a 1-cent increase an hour in each case on the present classification up to the fourth six months. It was further urged in the report that an additional class should be added for the fourth year and thereafter at 67 cents an hour, the highest at present paid being 65 cents. The adoption of this additional class would apply to approximately 80 per cent of the motormen at present in the service and amount to an increase of 2 cents an hour to the bulk of the motormen. The effect of the increase granted is to add about $15,000 a year to the wage accounts. The men's request for the fixing of an eight-hour day instead of a nine-hour day as at present was withdrawn.

Will Refund Car Fare.—When cars of the Nashville Railway & Light Company, Nashville, Tenn., stop before the Capitol Theater from May 23 to May 28, M. B. Thomas, manager, will meet the riders at the theater entrance and refund to them their carfare to and from the Capitol, so anxious is the Capitol management that every Nashville person should see Colleen Moore in "Orchids and Ermine." All that is asked of theater patrons is that they clip the coupon on "Read as You Ride," the pamphlet of the railway, and present it for refund when buying theater tickets.

Stars for Car Men.—Four more employees of the Jacksonville Traction Company, Jacksonville, Fla., have been awarded gold stars, representing twelve months of operation without a chargeable accident. An announcement to this effect was made recently by E. Q. Brown, superintendent of transportation. The four men completed their accidentless period in April.

Investigation Invited.—Mayor Frank B. Lovelace of Poughkeepsie, N. Y., recently sent a letter to the management of the Poughkeepsie City & Wappingers Falls Electric Railway notifying it of unpaid paving warrants amounting to $242,883, including interest and penalties. Without these items the debt would be about $190,000. Ralph F. Butts, attorney for the company, stated that the railway business, like other industries, had felt the general increase in costs of labor and materials caused by the war and had not been able to adjust its rates. For this reason it had to seek relief from the Public Service Commission on various occasions with the result that the fare, which had been 5 cents, was finally raised to 10 cents. However, the company finds itself unable to pay the paving bills at once and would like to have a committee of business men tell it what it would do if it were placed in the railway's position. Full financial statements are open for investigation. In conclusion, he said that the company's plight was a community affair.

Company Goes "On the Air." — A quartet of male voices sponsored by the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., was heard on May 13 over station WRC at Washington. Hereafter the quartet will be heard regularly every Friday night at 8:30 o'clock over the same station. The company resorted to the radio in "putting over" the new articulated cars. A radio announcer told all his listeners that it had spent half a million dollars in installing this service in Baltimore, "the first high-speed articulated, all-steel electric express cars on any interurban railroad in America." The announcer also said that the company had recently established a luxurious motor coach line between Washington and Annapolis over the new National Defense Highway. It was then made plain that the railroad was distributing a free booklet to summer cottages and bungalows in colonies near its lines.

Recent Bus Developments

Buffalo & Erie Agreement with Bus Company Ratified

The Public Service Commission on May 20 approved the petition of the Jamestown-Dunkirk Transit Company, Inc., for amendment to its certificate permitting a change in its route in Dunkirk and also approved an agreement entered into on March 1, 1927, between the petitioner and the Buffalo & Erie Railway, ratified by the city of Dunkirk on March 29, 1927.

According to the agreement the railway will not oppose the amendment of the bus line's certificate, provided it will be effective only for the term during which the agreement shall remain in force; that upon the termination of the agreement the bus lines shall automatically revert to their present routes. Other provisions stipulate that the railway shall furnish to the bus line a supply of transfers good for passage on the railway line in Fredonia and Dunkirk, and shall be entitled to receive from the bus line 10 cents for each transfer honored by it; that the railway and the bus line shall maintain the time schedule of buses and railway service agreed upon between them. It is arranged that the parties will establish, as soon as permission can be obtained from the commission, a joint excursion return trip rate between Lily Dale and Buffalo at $2.75 good in either direction, and a like rate between Buffalo and Jamestown of $3.88, good in either direction.

The agreement is to continue in force until terminated by either party giving to the other 90 days notice, except that in case of violation of the agreement either party may terminate upon ten days notice, specifying the ground of such termination.

Nebraska Operators to Appear on Bus Law

The Nebraska Railway Commission has cited all operators of intertown buses to appear June 8 and show cause, if any, why certain rules and regulations set out in the order shall not be adopted. The Legislature passed a law that becomes effective on July 24, giving the commission powers of regulation except as to rates of fare and the issuance of certificates of convenience and necessity. Previously the state regulatory body has acted under its general powers, but has confined its supervision largely to safety regulations and a requirement for liability insurance to passengers and their property.

The commission indicates that it will forbid any changes in schedules or routes in the future until after application, hearing and order. It will also make a similar ruling with reference to abandonment of a route after it has once been established. The commission will present a new form of insurance policy. The present requirement is for a minimum of $5,000 with a total liability for one accident of $10,000 for seven-passenger buses and with a maximum of $50,000 for 40-passenger capacity vehicles. The maximum will be raised, but the commission will insist that rates be so adjusted as not to be excessive.

Joliet Line Would Substitute Taxis for Unprofitable Bus

Permission to reduce its regular all-day motor coach service between Lockport, Ill., and the new Illinois State Penitentiary at Stateville to three or four round trips during morning and evening rush hours, and to establish taxicab service during the middle of the day, when traffic is light, and at regular taxi rates, is asked in a petition filed recently with the Illinois Commerce Commission by the Chicago & Joliet Electric Railway. The hearing was scheduled for May 25 in Joliet, Ill. According to the company's application, the motor coach line was established at the request of prison commissioners to accommodate workers engaged in construction of the new penitentiary. Since the structure was completed early this year, however, the number of workmen has been reduced and operation of the 2½-mile line is being carried on at a loss. The motor coaches connect at Lockport with the company's interurban cars operating on an hourly headway between Chicago and Joliet.

Bridge Tolls for P. R. T. Buses Increased

The Delaware River Bridge toll charged single-deck buses of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was increased from 25 cents to 50 cents per trip and the double-deck bus rate was raised to 75 cents, from the old rate of 40 cents, at a meeting of the Bridge Joint Commission on May 20. Independently operated buses, which have been paying a rate of 40 cents, will be charged 50 cents when the new rates become operative July 1.

Several of the commission members favored increasing the rates to 75 cents for the single-deck buses and $1 for the double-deckers, it was said after the meeting. The new rates were decided upon as a compromise. Bridge Commissioners estimated the new rates would increase the annual bridge revenues by $250,000.

Notice was served on the Penn-Jersey Rapid Transit Company, a P. R. T. subsidiary, which operates the bridge buses, that the rates would be increased upon expiration of the company's agreement on July 1. Independent operators also had been notified a general increase would go into effect. Passenger car rates were not changed.

Bridge officials said the first agreement was for one year only and was adopted merely as a tentative schedule. It was found the rates were out of line with toll charges on bridges in other sections of the country.

Bus Routes Proving Popular in Buffalo

Bus routes recently established by the International Railway in Kenmore and Tonawanda, N. Y., have proved so popular that additional buses had to be bought to meet the demand for service. Riding on the Buffalo city routes has also steadily increased, making the purchase of additional equipment necessary. Early this year the company placed an order for 24 gas-electric buses. The first of this order will be shipped within ten days. Last year 25 buses were bought and completion of this latest order gave the International Railway subsidiary a fleet of 81 buses, most of them of the modern gas-electric type. Five of the latest order will be of the de luxe style, seating 27 passengers and a special design for interurban and chartered service. Nineteen will be of the standard city type seating 33 passengers.

Additional express service, such as is now provided for North Buffalo and Kenmore during morning and evening rush hours, is being considered by the company and President Yungbluth has invited suggestions from riders as to the time when such service will be most helpful.

"Sho-Li-Mo-Co News" Chosen for House Organ Name

As a result of a recent contest among employees, "Sho-Li-Mo-Co News" is the name which has been officially adopted by the Shore Line Motor Coach Company, Gary, Ind., for its monthly employee magazine. The March number, which is the first issue to carry the new name, is the third which has been published by the company. The paper is edited by Don Bell in conventional newspaper style and consists of four pages of three columns each. It is 8½ x 11 in. and attractively illustrated with pictures of various employees and of buses and other properties of the company.

Buses Not to Replace Interurban

The Massachusetts Supreme Court has ordered dismissed the petition of Franklin P. Miller, receiver of the Boston & Worcester Street Railway, South Framingham, Mass., for permission to discontinue railway service on that line and to substitute buses. Judge Braley made this decision after he had been informed that the business of the company had improved considerably since Jan. 1.

Buses Substituted.—The New York & Stamford Railway, Stamford, Conn., has been authorized by the Public Utilities Commission to discontinue the operation of its railway between Atlantic Square, Stamford, and the New York State line. The petition of the company in which it sought to substitute bus service was recently heard and the commission gave its decision May 11. To operate the bus service the County Transportation Company, Inc., has been organized as a subsidiary. The commission granted permission to operate buses between Stamford and Port Chester, N. Y., and sanctioned a zone charge of 10 cents for the two-zone line. On the railway there were three zones with a 7-cent zone rate. The commission denied a petition by the County Transportation Company for a line between Greenwich and the state line.

Ready for Special Parties.—The Worcester Consolidated Street Railway, Worcester, Mass., has announced that it is equipped to take care of special parties in de luxe motor coaches. Employees are requested to act as salesmen in promoting this service for church picnics, beach trips and other social functions.

Bus Service Increased.—In line with its policy of extending transportation facilities to serve where traffic requirements warrant, the Winnipeg Electric Company, Winnipeg, Man., on May 16 instituted bus service on Ellice Avenue. Buses operate on a 7½-minute headway during normal periods of the day with extra service for the rush hours to provide for a five-minute headway.

Plans for Selby-Lake Bus Line.—A 12½-cent fare for local passenger traffic on the Selby-Lake bus line was agreed on by officials of the Twin City Rapid Transit Company and St. Paul Council members and steps have been taken to have the Railroad and Warehouse Commission approve the plan. As a result this line, already largely a local transportation convenience for residents along the route, will be developed for short trips as an auxiliary to the railway. The plan is to establish the token system on the Selby-Lake line, with two tokens at 25 cents. It will be a pay-enter pay-leave arrangement. Adequate service to meet the needs was promised by T. Julian McGill, vice-president and general manager, if the new plan results in increased patronage.

Buses Replace Cars.—The City Council of Moline, Ill., has authorized the Tri-City Railway to abandon railway service on its Stephens Park line and substitute buses. Similar schedules will be maintained.

Scores Bus Line for Infringing on Railway Territory.—The Public Service Commission has issued an order to John Fabia to show cause why the certificate issued to him Oct. 16, 1924, for a bus line from White Plains to Mount Kisco should not be revoked for violation of its terms. The Westchester Street Transportation Company, Inc., operates railway service in White Plains and one of its lines, known as the Silver Lake line, operates from a point in the town of Harrison to White Plains. The Fabia bus route practically parallels the Silver Lake line of the railway. To prevent competition between the bus line and the railway, a clause was inserted in the certificate issued to Mr. Fabia providing that no passengers should be taken on or discharged along the route operated by the railway or within 200 yd. thereof for rides which begin and end within these limits. Affidavits filed with the commission show that Mr. Fabia is taking on and discharging passengers along the Silver Lake line in violation of the terms of his certificate and also that he is not operating a portion of his route in White Plains over the route prescribed in the certificate.

Financial and Corporate

Gary Railways Would Issue $300,000 Equipment Trusts

Approval of the issuance of $300,000 par value of equipment trust certificates dated June 1, 1927, and maturing in ten annual installments beginning June 1, 1928, is asked of the Indiana Public Service Commission in a petition filed May 17 by the Gary Railways, Gary, Ind. Certificates maturing during the period from June 1, 1928, to June 1, 1932, will carry an annual interest rate of 5 per cent while those falling due thereafter will earn 5½ per cent dividends. They are to be sold at a price of not less than 94 per cent of par value.

The proceeds derived from the sale of these securities will be used to finance in part the purchase of a total of 22 double-truck motor cars. Twelve of the cars have already been acquired and are being operated by the railway, while the remaining ten are now in process of manufacture. The equipment designated will be leased to the company by a trustee at a rental sufficient to cover the interest and principle of the certificates, together with taxes.

Plan to Reclaim Part of Washington-Virginia Road

Faced with the possibility of abandonment of service in the near future on the Falls Church-Fairfax division of the Washington-Virginia Railway, sold at auction recently, leading citizens of that territory are making an effort to form a company to take over the line to insure continued service and to preserve the rail facilities as a factor in the future development of nearby Virginia. To this end Thomas R. Keith of Fairfax and M. E. Church of Falls Church have obtained an option until June 1 under which they have the opportunity of acquiring the Falls Church-Fairfax division for $150,000, the amount it brought at auction.

C. R. Hinchman, Philadelphia, from whom the option was obtained, has indicated an unwillingness to continue operation of that part of the system after June 1.

The Mount Vernon division of the railway, which passes through Alexandria, was disposed of as a separate unit at the auction, and Gardner L. Boothe, representative of the present owners, said no definite plans have been made for the future of that line.

The sponsors of this effort to have the people along the line to Fairfax organize it for the benefit of the community is stated in this outline of the plan:

> The purpose of the purchase of this road is to insure continual operation between Washington and Fairfax; not with the expectation of profiting on the operation of the road, but for the benefit of the patrons and those dependent upon it for transportation, and to insure its operation strictly in the interest of the patrons, devoting the income as far as possible, after a reasonable return upon the investment, to the betterment of the transportation facilities. No watered stock, excessive salaries or financing operations will be charged against the road.

$1,081 Surplus in April in Cincinnati

Decreasing loss in the motor coach operation of the Cincinnati Street Railway, Cincinnati, Ohio, was shown in the statement for April. The statement reveals a deficit of $11,066, against $12,643 for March, 1927, and $14,839 for April, 1926. Reduction in the length of one of the poor paying runs and changes in fare zones are the chief causes for this improvement. The deficit in coach operation for April was absorbed in the revenue from street cars, with a resulting surplus of $1,081 on the combined operation.

Operating revenue	$728,847
Operating expense	534,589
Net operating revenue	$194,257
Taxes	62,872
Operating income	$131,384
Non-operating income	1,811
Gross income	$133,196
Interest, sinking fund and return on capital	132,115
Surplus	$1,081
Total in fare control fund March 31, 1927	424,639
Total in fare control fund April 30, 1927	$425,720
Revenue passengers	8,498,892
Transfer passengers	2,651,239
Free passengers	128,041
Total passengers carried	$11,278,172

In submitting his statement to E. D. Gilman, Director of Public Utilities of Cincinnati, President Draper, in mentioning the expenditure for track reconstruction, stated that the amount expended in general account, way and structures, largely made up of track reconstruction, was just a little less than $100,000; that there was charged directly to operating expense in this account more than the month's regular proportion of the cost of replacements and renewals of track as provided for in the program for track rehabilitation.

Receivers Discharged in Kansas City

Francis M. Wilson and Col. Fred W. Fleming have been discharged as receivers of the Kansas City Railways, Kansas City, Mo. The final decree was entered by Judge Kimbrough Stone, who made the original appointment in October, 1920. The two receivers turned over the railway months ago to the Kansas City Public Service Company, but they were continued in office pending the working out of certain details of closing the six-year receivership.

Even the final discharge contains reservation under which Judge Stone

EARNINGS AND EXPENSES OF MONTREAL TRAMWAYS

Revenue:		1926	
Passenger earnings		$12,573,383	
Miscellaneous earnings		317,425	
Bus service:			
Gross revenue	$414,049		
Less interest on investment and operating expenses and other charges	405,255		
Net revenue		8,793	
Gross revenue		$12,899,602	
Expenditures:			
Operating expenses and taxes	$6,582,974		
Operating profit (to the company)	55,276		
Maintenance and renewals	2,870,229		
Total operating expenses		$9,508,480	
Net earnings			$3,391,122

Distribution of Net Earnings:		
To the company:		
For return upon capital value:		
6 per cent on $36,286,295	$2,177,177	
*Interest on additional capital expenditures	460,336	
Interest on working capital	3,915	
Total	$2,641,429	
Which together with the operating profit of $55,276 and interest on investment in bus service of $32,916 constitutes the company's revenue from the contract.		
For expense of financing—one-half of 1 per cent of the sum of $36,286,295 is allowed annually to the company to cover the expense incurred in procuring additional capital. This amount is carried direct to "Reserve for Financing."	181,431	
To the city of Montreal:		
Rental for the period twelve months ended Dec. 31, 1926	500,000	
Balance	68,261	
		$3,391,122

*The additional return of 1 per cent per annum provided by the contract payable for a period extending not more than five years beyond the close of the World War was discontinued Sept. 30, 1926.

can rename the two or appoint other receivers in the event litigation makes the existence of duly authorized receivers necessary. There still is pending an appeal by the old second mortgage bondholders from the foreclosure and form of decree. They seek a judgment against the property.

Montreal Does Well

Tramway in Canadian City Earns 16.98 Per Cent on Its Capital Stock —Earnings for Ten Years Compared

In view of the continuing increase in population and the resulting traffic congestion the Montreal Tramways, together with the Montreal Tramways Commission, has continued to study a definite plan which would not only materially relieve the present congestion but would adequately make provision for future conditions. The directors expect in due course to submit to the civic authorities a general plan of improvement, embracing subways and elevated railways, which, together with the other means at the disposal of the company, will provide efficient and rapid transportation consonant with the growth of the city. These statements were made by Julian C. Smith, president of the Montreal Tramways, Montreal, Que., in the annual report submitted at the annual general meeting held on March 29, 1927.

This for the year ended Dec. 31, 1926, reflects further progress. Net income earned on the $4,000,000 of capital stock was equivalent to 16.98 per cent, compared with 8.03 per cent for the half year ended Dec. 31, 1925, and 15.59 per cent for the year ended June 30, 1925. Up to June 30, 1925, the fiscal year of the company ended in the middle of the year, but a change was then made so that the fiscal and calendar years would coincide and in consequence the report preceding the present one was for a period of six months ended Dec. 31, 1925. Passenger revenues were at a new high level, being shown at $12,573,383 compared with $12,145,440 for the previous full year, which was the former record. The bus service shows a net profit of $8,793 after deduction of interest on investment and other charges and operating expenses. This result compares with a net deficit of $498 on the bus service reported in the statement for the second half of 1925.

During the fiscal year the number of buses in operation has been increased from 24 to 55. The report pointed that the bus service is only on trial and that the increased service was given with a view of meeting the wishes of the public and in an endeavor to relieve the traffic congestion.

The proposed reorganization of the employees' mutual benefit association came into effect as of May 1, following a thorough study and discussion of the scheme by the employees. Under this arrangement the employees are now provided with substantial sick and injury benefits and pension and death benefits in keeping with present-day conditions. During the year the agreement with the employees covering their wage schedule was extended upon similar conditions to July 1, 1930.

During the year $1,000,000 of the common stock of the company was issued to the shareholders at a price of $125 per share, shareholders receiving one share of new stock for each four shares held at the close of business on Oct. 15, 1926. There has been paid in on account of this issue $649,718. The balance due became payable on March 31, 1927.

The accompanying report for the year 1926 shows the results obtained from the operations under the contract with the city, and the share of the gross revenue accruing to the company under the provisions of the contract and the disposition of same.

The gross revenue for the year accruing to the Montreal Tramways from

STATEMENT OF OPERATIONS OF THE MONTREAL TRAMWAYS FROM FEB. 10, 1918, TO DEC. 31, 1926

	Feb. 10, 1918, to June 30, 1919	Year Ended June 30 1920	1921	1922	1923	1924	1925	Six Months Ended Dec. 31, 1925	Twelve Months Ended Dec. 31, 1926	Feb. 10, 1918 to Dec. 31, 1926
Gross receipts	$11,572,210	$10,782,470	$11,773,004	$11,712,525	$12,056,355	$12,463,798	$12,476,566	$6,305,491	$12,899,602	$120,042,025
Operating expenses and taxes	$6,640,715	$5,849,911	$6,327,841	$5,769,403	$6,099,993	$6,246,889	$6,323,000	$3,052,441	$6,582,974	$52,893,173
Operating profit	45,927	46,606	47,442	47,959	48,304	48,554	50,684	26,606	55,276	417,363
Maintenance and renewals	2,098,120	2,190,557	2,529,054	2,579,200	2,492,792	2,579,779	2,577,260	1,599,543	2,870,229	21,516,538
Total	$8,784,763	$8,087,076	$8,904,337	$8,396,563	$8,641,090	$8,875,224	$8,950,945	$4,678,590	$9,508,480	–$74,827,072
Balance	$2,787,446	$2,695,394	$2,868,667	$3,315,961	$3,415,264	$3,588,574	$3,525,621	$1,626,900	$3,391,122	$27,214,953
Allowances due company:										
6 per cent on capital value	$3,018,224	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$2,177,177	$1,088,588	$2,177,177	$19,347,057
Additions to capital	32,919	69,827	118,859	145,683	164,973	175,918	277,667	195,862	460,336	1,642,048
6 per cent on working capital	40,645	23,832	12,490	6,569	2,530	5,351	5,707	1,733	3,915	102,803
Financing expense	251,353	181,431	181,431	181,431	181,431	181,431	181,431	90,715	181,431	1,612,089
Total	$3,343,142	$2,452,269	$2,489,959	$2,510,889	$2,526,113	$2,539,879	$2,641,983	$1,376,900	$2,822,860	$22,703,998
Balance	*$555,695	$243,124	$378,707	$805,072	$889,151	$1,048,695	$883,637	$250,000	$568,261	$4,510,955
Payable when earned:										
City of Monreal rental	$692,694	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$250,000	$500,000	$4,442,694
Contingent reserve fund	115,722	107,824	117,730	117,125	41,597	....	....	....	....	500,000
Total	$808,416	$607,824	$617,730	$617,125	$541,597	$500,000	$500,000	$250,000	$500,000	$4,942,694
Deficit	$1,364,111	$364,700	$239,022	....	....	....	....	....	....	$431,738
Surplus	....	....	....	$187,947	$347,553	$548,695	$383,637	....	$68,261	....

*Deficit.

DISTRIBUTION OF MONTREAL EARNINGS

Revenue:		
Allowances from contract:		
Return upon capital value		$2,641,429
Interest on investment in autobus service.................		32,916
Operating profit.....................		55,276
Other revenue (outside of contract).....................		76,103
Total revenue....................		$2,805,726
Expenditures:		
Interest on bonds and loans	$2,118,060	
Other expenses............	8,506	
Total expenses..........	$2,126,566	
Net income.............	$679,159	
Less dividend of 2½ per cent for quarter ended:		
March 31, 1926............	$100,000	
June 30, 1926............	100,000	
Sept. 30, 1926............	100,000	
Dec. 31, 1926............	100,000	
Total..........................		$400,000
Surplus for the year..........		$279,159
Add surplus at Dec. 31, 1925		1,014,037
General surplus...........		$1,293,197

the operations under the contract, together with the miscellaneous revenue from other sources, has been distributed as shown in the accompanying table.

Rate Making Versus Sales Value Defined

United States District Judge Faris, sitting as a member of the United States Circuit Court of Appeals in the Denver railway case, has concluded that the valuation of a public utility for rate-making purposes may be much greater than its actual or market worth.

At the request of the receiver of the Denver Tramway the United States District Court at Denver fixed a rate-making valuation that was in excess of the claims against the company, both secured and unsecured, when the receiver took charge of the property. On that ground a group of creditors undertook to overthrow the reorganization plan by alleging that the company was never insolvent and should not have been placed in receivership. In affirming the District Court of Denver Judge Faris said:

> The rating base value furnishes no proper or legal criterion on which to bottom actual value. The former, according to the Supreme Court, is, as to physical elements, bottomed on present value of lands held, plus present stable cost of constructing the plant, less depreciation for use since construction, plus a fair allowance for going value, for intangible elements and for working capital. The latter, in a case like this, is bottomed on what a willing buyer, under no duress to buy, ought voluntarily to pay when the seller is forced to sell.
>
> The very definitions thus disclose the difference between such value and actual, or fair and reasonable, market value. The specific elements which enter into the actual value of a great railroad property as a going concern are: (a) The value of the use of such property in the operation of its railroad and the net revenue from such case, and (b) the current market value of its stocks and bonds.
>
> Obviously, the reference to the value of the stocks and bonds must be applied, in case of insolvency and reorganization, largely to the stocks and bonds of the new organization, and not to those of the old and insolvent one, because the latter would not reflect any earning value, but only exchange value under the plan of reorganization. But nevertheless these differences of constituent elements illustrate the fairly clear distinction existing between value for rate-making purposes and fair, market or actual value; and we think, show that the former does not necessarily bear any conclusive legal relation to the latter. Certainly this is so as to the matters herein up for judgment; whether it be so in all cases and situations we need not rule. Indeed, to take any other view of it would present a case of contradiction in terms.
>
> Practically speaking and in the light of human motives and experience, exchange or actual value of any commodity, except jewels, works of art, fungibles (articles destroyed by use), and the like, is bottomed on what a property will produce in earnings to the owner. But rate-making value is not and cannot be bottomed on earnings. If it were, or could be, it is plain that the more a railroad charged and earned, the more it would be entitled to charge and earn, and so, as has been said, there would arise an approximation of perpetual motion.

Interest on Chicago Bonds to Be Paid

The bondholders' protective committees of the Chicago City Railway and the Calumet & South Chicago Railway announced on May 20 that the interest due on the first mortgage 5 per cent bonds of both companies will be paid on Aug. 1. The principal of the bonds matured on Feb. 1 with the expiration of the franchise ordinances. A letter sent to bondholders says earnings are ample to pay interest obligations, and urges bondholders who have not yet deposited their bonds to do so at once in order that they may receive their interest promptly.

Readjustment at Grand Rapids Approved

At a special meeting on May 25 stockholders of the Grand Rapids Railway, Grand Rapids, Mich., approved a plan for readjusting the finances of the company in accordance with terms which have been reviewed previously in detail in the ELECTRIC RAILWAY JOURNAL.

Sale of St. Louis Property Postponed

The foreclosure sale of the United Railways, St. Louis, Mo., scheduled for May 25, was postponed at the request of Samuel Mitchell, solicitor for the Mercantile Trust Company, St. Louis, a plaintiff in the case by virtue of being trustee for an issue of bonds. William I. Igoe, special master, has not set the new date for the sale.

The reorganization committee plans to buy in the properties for the St. Louis Public Service Company, which is asking a 30-year service-at-cost franchise from the city.

The hearing on the application of Receiver Rolla Wells of the United Railways for a straight 8-cent fare has been continued by the Missouri Public Service Commission to permit counsel for the city to study transcripts of evidence offered by the company. The city has withheld its cross-examination.

Meanwhile the commission has been asked by Mayor Miller and Stanley Clarke, attorney for the reorganizers, to fix the rate of return the company should be permitted to earn under a service-at-cost franchise. This recommendation probably will be written into the new franchise before it is submitted to the voters of the city for ratification. Mayor Miller favors 6 per cent on a $60,000,000 valuation.

In his evidence in the rate case now under consideration Receiver Wells is asking for an 8 per cent return and has endeavored to build up a reproduction-new valuation of $101,233,616, and a present valuation of $75,454,073 for fixed property other than land. The going concern value of the properties was set at $8,700,000.

Conspectus of Indexes for May, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	May 1927 **7.44**	April 1927 **7.43**	May 1926 **7.36**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	May 1927 **144.2**	April 1927 **148.0**	May 1926 **153.1**	Sept. 1920 **247.5**	April 1927 **148.0**
Electric Railway Wages* 1913 = 100	May 1927 **227.4**	April 1927 **226.9**	May 1926 **225.4**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	May 1927 **201.0**	April 1927 **202.6**	May 1926 **202.4**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	May 1927 **206.8**	April 1927 **209.0**	May 1926 **207.3**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	April 1927 **144.2**	Mar. 1927 **145.3**	April 1926 **151.1**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	May 1 1927 **12.44**	Apr. 1 1927 **12.53**	May 1 1926 **12.86**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	April 1927 **153.6**	Mar. 1927 **153.8**	April 1926 **162.4**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	April 1927 **163.7**	Mar. 1927 **164.1**	April 1926 **168.4**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1927 **3.456**	Mar. 31 1927 **3.553**	Apr 30 1926 **3.868**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	April 1927 **18.55**	Mar. 1927 **19.53**	April 1926 **18.80**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	April 1927 **1671** **55.36**	Mar. 1927 **1882** **99.26**	April 1926 **1741** **47.50**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

***The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.**

Personal Items

From "Banana Line" to Road of Service

Jamaica Central Railways Now Provides Adequate Facilities for 30,000 Persons Daily Under W. E. Ross

As a trolley the railway from Jamaica to Far Rockaway and from City Line to Belmont Park was long the community's standing joke. Just one year has changed not only the street railway system itself, but the public's mental attitude toward it. The official cognomen of the old line was the Long Island Electric Railway. Now the reorganized, revamped, repaired, reequipped, remanned and remade system is known officially as Jamaica Central Railways, Inc.

OFFICERS PROMINENT FOR ACCOMPLISHMENTS

Like most other similar enterprises, the Jamaica Central Railways, Inc., reflects the hopes and aspirations of the men at its head. It is officered chiefly by men who had made a mark in the world of finance, but whose experience in conducting an almost defunct railway was negligible. The president is H. Pushae Williams, president of the First Mortgage Guarantee Company of Long Island City and former president of the Queensboro Chamber of Commerce. The vice-president is Robert M. Catharine, Jamaica, one of the officers of the Bank of the Manhattan Company. In the treasurer's chair is Park A. Rowley, another prominent Jamaica banker, who is vice-president of the Bank of the Manhattan Company and in charge of all the Queens branches of this huge and important financial institution. H. L. Dayton, secretary, completes the official roster.

As their titles show, all are busy men. They give of their time to the railway only when matters of general policy are to be decided. The every-day affairs of the company they have intrusted to W. E. Ross, who has been general manager since March 15, this year, but was connected with the company previously and brought to the job a wide fund of experience. More about that later, for after all, accomplishments reflect the personalities of men and very often of one man in particular.

Now for these accomplishments. The Long Island Electric Railway became the Jamaica Central Railways, Inc., on April 6, 1926. The new corporation took over the property from a receiver. It consisted principally of the proverbial "two streaks of rust and a right-of-way." The cars were falling apart. The tracks were so badly worn that cars a dozen times a day left the rails. The concern had some ancient carhouses on New York Avenue, in the Cedar Manor section, but the principal building had never been rebuilt after a fire that practically destroyed it. Such machinery as there was for repairing and maintaining the cars and the roadbed was obsolete and of slight use. Several of the cars had been destroyed in the fire at the carhouse and the new owners found themselves the possessors of 25 ancient vehicles of the closed type and two of the open variety. Only the car crews knew when they were supposed to arrive at or leave any given point and the knowledge did not cause them undue anxiety, for usually it was impossible to adhere to any schedule, so dilapidated and untrustworthy were the cars and so unsafe the roadbed.

As quickly as possible, the new management placed six large cars in operation on the Far Rockaway line. Then ten one-man cars were added to the service. Two months ago six more closed cars were put in operation. As a result of the additional rolling stock, the headway has been materially shortened and now there is real service on the system's two lines, one between Jamaica and Far Rockaway and the other from Liberty Avenue and 100th Street, Ozone Park, to Belmont Park. That these two lines are vital to the public is revealed by the fact that 30,000 passengers ride upon them each day. This is an increase of more than 60 per cent over the amount of travel a year ago. Naturally the officers, and especially Mr. Ross, are justly proud of the fact that they can handle the increase and that so many persons find it advantageous to travel on the cars.

W. E. Ross

Twenty-two of the old cars taken over from the receiver have been repainted and put into first-class condition. All the obsolete machinery has been replaced and much new machinery added, so that the company is now able to keep its rolling stock in excellent condition at all times. A storage shed large enough to hold sixteen cars has been erected at Cedar Manor on the site of the one destroyed by fire. Into this shed every car is run at least once each week—every time it has traveled 1,000 miles—to be thoroughly inspected and, if necessary, repaired. Each car gets a daily cleaning and a weekly bath. All in all, 33 cars are in daily operation. Within a month there will be 37 on the daily schedule.

The officers of the company have gone further than merely to rebuild their cars, replace their trackage and wiring and machinery. They have created out of a haphazard nucleus of employees a band of earnest, hard-working men, with a realization that the public interest is their interest. For example, the company, at no cost to its employees, has provided each with a $1,000 insurance policy. To furnish a real incentive to good railroading, there is an annual prize of $500 to the employee with the best record. A bonus is paid monthly to motormen who have had no accidents on their runs. By this bonus system a careful motorman can add $100 to his year's wages. As a result, 52 of the motormen turned in reports for March showing not a mishap.

In all this work Mr. Ross has, of course, been at the front, aided and abetted by the encouragement of the directors of the company and the other officers. He went with the company in April, 1926. Previous to that time he was with the New York & Queens County Railway for nearly fourteen years. His last position with that company was engineer of way and structures under Lincoln C. Andrews. Mr. Ross was educated in the New York schools. The New York & Queens County position was his first job. He is 29 years old, but he has packed a lot of experience into these years. After all, for most of us life is estimated on the basis of accomplishments and not of years. On that basis does Mr. Ross stand revealed as a man of unusual resourcefulness.

◆

Key System Changes

W. R. Alberger and G. H. Harris Withdraw from Oakland Property—A. J. Lundberg a Director

Important changes are announced in the personnel of the Key System Transit Company of Oakland. W. R. Alberger, who has been connected with the company for the last 21 years, resigned as vice-president and George H. Harris resigned as general manager. It is understood Mr. Alberger will remain a member of the board.

Mr. Alberger has been succeeded by Alfred J. Lundberg, member of the San Francisco stock brokerage firm of J. Barth & Company, now the largest holder of Key stock. Until two years ago Mr. Alberger was vice-president and general manager, but was relieved of the duties of the last-named office, being succeeded by Mr. Harris.

The position of general manager, vacated by Mr. Harris, has been abolished, effective on June 1. Lester S. Ready, president of the company, will become operating head. Mr. Harris was promoted to the office of general manager from chief engineer.

In commenting on the changes, President Ready said:

> Following the election of Gustav Epstein and A. J. Lundberg as directors a few weeks ago, A. J. Lundberg has been chosen vice-president of the Key System Transit, succeeding W. R. Alberger, resigned.
>
> This is simply a recognition of the largest holders of Key System securities and brings to the service of the system several men of high standing who have a personal interest in the development of transportation in the East Bay district.
>
> Messrs. Epstein and Lundberg and H. E. Clayburgh, who has been on the board

since last November, are partners in the old established firm of J. Barth & Company, San Francisco, large holders of Key System securities. The partners in this firm intend to give of their time to the East Bay's transportation problem, the solution of which is as important to the people of the East Bay as to the owners of the Key System Transit Company. Both the people and the company are to be congratulated that men of standing will devote their time to reaching such solution.

Mr. Lundberg issued a statement in which he said:

Transportation is the backbone of every growing community. The Key System Transit Company is in the business of furnishing transportation to ten East Bay municipalities and two East Bay counties. The Key System is, therefore, the backbone of those ten municipalities and portions of these two counties. This is fully realized by my partners and me in taking positions as Key System directors. We believe in the East Bay and its growth and our primary idea will be to furnish adequate transportation of the right kind. Other plans will be secondary.

The Key System occupies the most important position in the East Bay, absolutely dominating local transportation and practically dominating transbay transportation. We do not intend to lose or jeopardize our dominating position. The Key System is fundamentally sound. It has ample physical assets. But there are many things that can be done in a spirit of co-operation between the people we serve and ourselves. We are ready to go much more than half way.

Our policy will be, first, a transportation system that will meet the needs of the wonderfully growing East Bay district. We in San Francisco are beginning to discover what you have in the East Bay. Millions of dollars of San Francisco money are being invested in Oakland and millions more will come if the same spirit of co-operation that has existed in the last few years continues. My partners and I have already invested large sums in Oakland and some of the directors of the Key System have been instrumental in bringing other millions to this side of the bay. I look for a wonderful growth, in which we hope to participate.

Retirement of Mr. Alberger and Mr. Harris means the withdrawal from active management of the East Bay's car lines and transbay ferry service of the last survivors of the F. M. Smith régime.

Further changes are anticipated, it being understood that the two announced are only the start of a thorough reorganization, including a change of policy. It is now declared that the new policy will not include the plans to unify the Key and the Southern Pacific ferry and rapid transit system. These plans had been mapped by engineers of both companies and were being studied by the respective managements.

In Memoriam

JUNE 1, 1926—JUNE 1, 1927

"We Live in Deeds, Not Words"

Since June 1, 1926, Death, The Inescapable, has taken its toll of those in our industry whose deeds live after them. At this season of memorial, the JOURNAL *is calling the roll, conscious that it will be answered by the thoughts of comrades who still march forward, guided by the unquenchable ideals these dead have bequeathed them.*

Eliseur S. Goodrich, former president Hartford Street Railway

J. D. Spreckels, president San Diego Electric Railway

John E. Duffy, general superintendent New York State Railways

Bert Weadon, traffic manager Interstate Public Service Company, Indianapolis

William S. Hamilton, supervisor of stores New York State Railways

George L. Fowler, consulting engineer

Charles A. Coffin, president General Electric Company

Herbert C. Moser, general manager Chicago Motor Coach Company

Franklin S. Terry, vice-president General Electric Company

Julius Thielson, superintendent Providence & Danielson Street Railway

Russell A. Wilson, assistant general manager Spokane United Railways

P. F. Sullivan, Bay State Street Railway

Clifford A. Elliott, cost engineer Pacific Electric Railway

C. R. Huntley, director International Railway and president of the Buffalo General Electric Company

J. E. Allison, head of James E. Allison & Company, Consulting Engineers

Robert Jemison, former president Birmingham Railway, Light & Power Company

A. D. McPherson, auditor Pittsburgh Railways

Alfred Craven, well-known engineer

Frank Cook, sales manager Ohio Brass Company, St. Louis district

Clermont Harvey Wilcox, president New York Insulated Wire Company

Anderson Gilbert Moore, industrial agent Interstate Public Service Company

Simon Bamberger, chairman of the board Bamberger Electric Railroad

Z. E. Knapp, director of construction London Underground Electric Railways

E. W. Bowman, supervisor of insurance Philadelphia Rapid Transit Company

Charles S. Butts, engineer in Department of Public Utilities for St. Louis

R. E. Breed, director American Light & Power Company

Adolphe Alfred Dion, president Moose Jaw Electric Railway

Paul E. Mercier, member Montreal Tramways Commission

Frederick M. Nellis, special representative at New York Westinghouse Air Brake Company

Frank M. Webster, claim adjuster Grand Rapids Railway

Virgil R. Powell, vice-president and general manager Peoples Railway, Dayton

Charles Edward Warren, long connected with New York Railways and Interborough Rapid Transit Company

W. H. Long, superintendent of power York Railways

Hugh A. Heulings, sales representative Brill Company

Col. William G. Dows, president Iowa Railway & Light Company

William B. McKinley, former head of Illinois Traction System

Henry J. Arnold, organizer of the Durango Street Railway

Frederick G. Orcutt, assistant paymaster Connecticut Company

E. M. Walker, president Schenectady Railway

William T. Fitch, superintendent maintenance of way Philadelphia Rapid Transit Company

Samuel M. Clement, former Public Service Commissioner of Pennsylvania

Alves Dixon, general manager Baton Rouge Electric Company

C. E. A. Carr, former Canadian electric railway official

M. H. Bronsdon, former chief engineer United Electric Railways, Providence

Clifton Colbrun, treasurer of Nahant & Lynn Street Railway

Anson W. Burchard, vice-chairman of board General Electric Company

Col. H. G. Prout, internationally known engineer and editor

William L. Schulz, formerly claim agent Washington, Baltimore & Annapolis Electric Railway

William Wright, auditor Washington, Baltimore & Annapolis Electric Railway

William H. Hodgins, secretary Okonite Company

O. C. Macy, vice-president Chicago, Harvard & Geneva Lake Railway

Albert Bath, executive of Detroit Department of Street Railways

Russell Robb, senior vice-president Stone & Webster

Lynn Shaddeau, purchasing agent Saginaw Transit Company

John S. Moore, general passenger and freight agent of Chicago, South Bend & Northern Indiana Railway

Charles Sidney Baxter, formerly with law department Boston Elevated Railway

Edward Carpenter Wood, president Mica Insulator Company

Edwin Samuel Ely, consulting engineer Virginia Electric & Power Company

Dudley Farrand, vice-president Public Service Corporation of New Jersey

George J. Baldwin, Stone & Webster

James W. Samuel, former assistant treasurer United Railways, St. Louis

Joe C. Thompson, secretary and assistant treasurer Texas Power & Light Company

Wallace Heckman, vice-president Chicago Railways

Oren Joseph Smith, one time chief engineer Denver Tramway

Joseph J. Heim, railway pioneer in Missouri and Kansas

Albert Ball, chief mechanical engineer Sullivan Machinery Company

Fred W. Reitz, president Evansville Traction Company

Jilson J. Coleman, vice-president and general manager Scranton Railway

Major S. L. Nelson, pioneer utility magnate in the Middle West

Albert M. Lynn, president West Penn Electric Company

William T. Nary, superintendent Berkshire Street Railway

Charles L. Henry, receiver Indianapolis & Cincinnati Traction Company

W. Kesley Schoepf, former head Cincinnati Traction Company

Marshall G. Linn, vice-president and general manager Des Moines Electric Light Company

G. E. Maltby, vice-president Jamestown Street Railway

Clyde F. Kalp, treasurer West Penn Railways

R. S. Maddock, superintendent of equipment United Electric Railways

H. E. Huntington, father of the Los Angeles local and interurban systems

Henry E. Huntington Dead

Romantic Career of Retired Railroad Director Ends in His Seventy-eighth Year—An Important Figure in California Utility Development—A Book Collector and Art Connoisseur

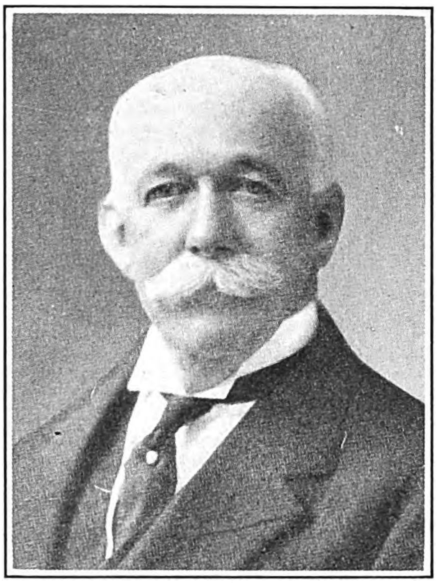
NOT all poets express themselves in words. This comment might serve as a fitting eulogy on the life of Henry E. Huntington, which terminated on May 23. The romantic and imaginative soul, nephew of Collis P. Huntington, among the first of the country's railroad men, found an outlet for his feelings in organizing and directing railroads, collecting rare books and works of art and in generously donating to philanthropic causes.

Not unlike the poet, the realization of profits alone was not the driving force back of his pioneering. True, he amassed a great fortune both for himself and his backers, but he was always peering beyond the horizon of personal profit, measuring his gain by the usefulness of his ventures. And the beneficiaries of his tireless energy, unfailing courage, unbounding resourcefulness and reliable judgment bear testimony to his transcendental vision. His genius for acquisition, minus the usual concomitant of avariciousness, is evidenced in his library and art collections, which upon his death are turned over to the public in perpetuity. In a beautiful building in San Marino, Cal., young and old, rich and poor, can view the famous Bridgewater library, renowned in England since the days of Queen Elizabeth and bought by Mr. Huntington in 1917. Competent authorities place the value of his art and rare books and manuscripts between $30,000,000 and $40,000,000, but Mr. Huntington did not count the cost. The hope of the man was that within the white stucco structure, finished in Italian style, inspiration could be had for the seeking.

Blazed the Western Trail

Surely Californians, and especially sons of Los Angeles, are both grateful and proud that Henry E. Huntington had a hand in the making of the West, for at the psychological hour in 1898 when the city of Los Angeles was cautiously courting prosperity along came the needed financier, who with foresight and courage projected a network of electric railways in the city which converted hamlets and villages into commercial and trading centers and made barren ground desired sites for homeseekers. Southern California, Henry E. Huntington and prosperity became a triumvirate the exploits of which will fill many pages of history.

As if by instinct he gradually gravitated to railroading. Though a descendant of railroad builders and a nephew of Collis P. Huntington, a pioneer of transcontinental railroad traffic, Henry E. at first showed little inclination for that calling. He left Oneonta, N. Y., where he was born on Feb. 27, 1850, and entered the hardware business. He was then twenty years old. Some years later he embarked in the lumber business in St. Albans, W. Va. Here, it is said, C. P. Huntington noted the ability of his young nephew and made him superintendent of construction of the Huntington line, then being built from Louisville to New Orleans. And so the career of the former hardware merchant began in earnest. He directed as many railroads as his promoter and backer had built. Some years later the elder Huntington made his protégé his chief aid and general representative in running the Central Pacific and Southern Pacific Railroads. As the years advanced the bond between the two men became closer, and when Collis P. Huntington died, in 1900, he left a large share of his millions to his nephew. That fortune and the one inherited by the uncle's widow were united in 1913 by the marriage of the widow to Henry E. Huntington.


Henry E. Huntington

It was after his uncle's death that the younger man turned to the West Coast, especially to developing projects in southern California. He acquired the Market Street Railway, San Francisco, selling the property in 1898 and buying the Los Angeles Railway. He merged a group of interurban railways into the Pacific Electric Railway, but sold that property to the Southern Pacific. It was in Southern California that he was convinced that he had located the field in which his capital might most profitably be employed. Los Angeles today is a thriving example of his judgment in that respect. The construction of the Pacific Electric Railway contributed greatly to the growth of Pasadena, Glendale, Alhambra, Huntington Beach, Alamitos and other important California centers. He added hundreds of miles of track to the system and spent more than $30,000,000 on improvements. The safety and comfort of the passengers were of no less importance to Mr. Huntington than the growth and development of the system. Meanwhile he interested himself in land developments, traffic problems, power development and all forces which might play an important part in the future of Los Angeles. Few men could read more accurately the signs of the times than Mr. Huntington.

Contemplative in Later Years

A review of the life of Henry E. Huntington discloses two periods of activity, distinct and defined. It was as if fate somehow had summoned him to fulfill two missions, the first to be concluded at about the age of 55 and the second with his death, at 77. In that first period he exhibited an uncanny capacity for physical activity and accomplishments only to be equaled by his desire for reflection and contemplation in the winter of his career. He was famous in his younger days as a director of railroads and in his older days as a pre-eminent collector of rare manuscripts and a connoisseur of works of art. His genius for acquisition was no less noteworthy, whether the object of his desire was a railroad or a Rubens, and the same characteristics which insured success in his early business ventures and won for him the reputation of pioneer and genius stamped him as a distinguished collector of books and works of art and intrenched him firmly in more than local affections. There is unmistakable evidence of the pride of the public in the certain endowments directly attributable to the railroading and rarity ventures of Henry L. Huntington.

Nicholas F. Niederlander, 80 years old, who was president of the Westinghouse Coupler Company until about fifteen years ago, when he retired, died in St. Louis, Mo., on May 20. He was president of the Westinghouse company for ten years prior to the time he retired.

John H. Slough, for 23 years a general claim agent for the United Railways, St. Louis, Mo., died at his home in Overland, St. Louis County, Mo., on May 13. He retired from active field service four years ago, but since then had been on special assignment in the office of the claim department of the company. He ranked as an assistant claim agent. Mr. Slough was 70 years old.

William E. Holstock, superintendent of transportation on the Syracuse lines of the New York State Railways, died on May 5. He had charge of all employment, discharges and discipline. At a very early age Mr. Holstock took a position with the Saginaw Street Railway, where he received experience in railroading both as a conductor and a driver of horse cars. In 1887 he went to Syracuse and entered the employ of the People's Railroad, where he soon was advanced to the position of carhouse foreman. In this position he had charge of 400 horses housed at the carhouse and his duties included the buying, selling and trading of horses. When the Syracuse lines were electrified Mr. Holstock was made station master at the Wolf Street station. On April 16, 1906, he was appointed general foreman. He next advanced to superintendent. Mr. Holstock was born on June 14, 1859.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Large Coal Stock Nullifies Strike Menace

The Bureau of Mines stock report raises the curtain on the stage which was set April 1. It confirms in full the impression that had been created by heavy production that stocks are enormously large. They are so large that, strike or no strike, they will dominate the market for months to come.

Stocks of bituminous coal in the hands of consumers totaled 75,000,000 tons. This is 12,000,000 tons in excess of the previous record, established on Armistice Day at the close of the fuel administration's campaign for emergency storage. It is 13,000,000 tons greater than the reserve built up at the beginning of 1924, when consumers foresaw the possibility of a strike which was avoided by the Jacksonville agreement. It is from 12,000,000 to 15,000,000 tons greater than the reserve at the beginning of the strike of 1922. Besides the coal in the hands of consumers there was a very large reserve in transit.

The record shows that consumers have refused to take chances, despite the practical certainty that production would continue at the rate of 8,000,000 tons or 9,000,000 tons a week, as against only 3,000,000 tons or 4,000,000 tons in 1922. They laid in a reserve 20 per cent greater than that which they built up in 1922. The railroads alone have 22,800,000 tons of coal on hand.

With this unusual amount of coal above ground it is regarded as a complete explanation as to why the market has been so dull since the suspension began. At least 40,000,000 tons of the surplus will have to be absorbed before the market will be in a usual state of balance as between buyer and seller. Had there been no suspension it is doubtful if current production would have been any larger. A long period of low weekly tonnages appears inevitable.

Under the circumstances the suspension must last a long time before it can change the market and offer any hope of profit to the hard-pressed union operator. On the other hand, an immediate settlement still would leave the industry faced with the problem of absorbing an undigested surplus of 40,000,000 tons.

Track Reconstruction Under Way in Springfield, Mass.

The Springfield Street Railway, Springfield, Mass., has started work on the first lap of its reconstruction program. Trackwork on Sumner Avenue is to be started at once and the work of tearing up the old trackwork is already under way. The entire project between White Street and the X will be completed in about three weeks. This will be followed by relaying the tracks on Belmont Avenue from the X to the East Longmeadow line. Tracks are also to be relayed on State Street from Benton Street to Pine Point. In order to expedite the transportation of passengers Herbert M. Flanders, general manager, plans to use buses to transfer passengers.

Ban Put on Noisy Exhibits at A.E.R.A. Meeting

In connection with the exhibit application blanks recently mailed out by Fred C. J. Dell, director of exhibits of the American Electric Railway Association, attention is being called to the committee's ruling on noisy exhibits. The ruling especially applies to the Esplanade, Section E, and Exhibition Hall, Section B, where the following restriction will obtain:

"Noisy exhibits will not be permitted to operate during convention sessions except in prescribed areas. Under no circumstances will the operation of noisy exhibits be permitted in the proximity of meeting rooms." Exhibitors are asked to co-operate.

Capitalism and Communism at Grips in Geneva

Russian Delegate Rakes Capitalist System and Suggests Transitional Plan of Eleven Steps for Renewal of Trade—Unanimity on Nations' Interdependence

By Edward J. Mehren

Vice-President McGraw-Hill Publishing Company

GENEVA, May 9.

THE plenary sessions of the International Economic Conference are over for the present and the committees on commerce, industry and agriculture get under way this morning. The closing plenary sessions rivaled in interest the earlier ones, for they included the speeches most eagerly awaited—those by Henry M. Robinson, head of the American delegation; by the Russian delegates Sokolnikoff and Obolenski-Ossinski; by W. T. Layton, editor of the *Economist* and member of the British delegation, and by Monsieur Loucheur of France.

Robinson Speaks for America

What would be America's view of the various proposals, was the constant query of the first two days, and when it came none could want a clearer statement than Mr. Robinson's. The American believed that the actual level of tariffs are less of a barrier to trade than lack of stabilization of tariffs, abrupt changes in duties, lack of definiteness in classification and terminology. In maturing methods for mitigating those difficulties the conference might help.

The American delegation, he indicated, would not oppose the international cartel idea as such, but would disapprove government participation in them and insist that they must not exploit the consumer. He sketched briefly and clearly the development of the American industrial system and accounted for our present prosperity by improvements made in management practice, by elimination of waste, by lavish use of machinery and full interchange of information on production and trade methods. He indicated that the tendency of management now was to secure needed economies by bettering its practice, eliminating waste and introducing more and better machinery rather than by wage reduction.

Mr. Robinson, I said, was calm and gracious, but while continuing so he showed that there was fighting reserve, if need be. Sir Max Muspratt, Great Britain, had said that there was no discrimination against America in the rubber exportation restriction, since all nations were treated alike. Mr. Robinson remarked that he could not follow the argument when a non-producing country (America) took 75 per cent of the production, while the country which controlled the restrictions consumed only 7 per cent of the supply.

The speech was well received, and comment on it indicated again the opinion in Europe that we are the darling of the Gods. They are trying to grasp our secret, they doubt that the methods are applicable here, but they vaguely realize that in some way they have to grow into an industrial practice approximating ours.

Russia Speaks

But if Mr. Robinson received close attention, the interest was intensified when Sokolnikoff arose. Delegates massed solidly around the tribune to catch every word. What would a new social order say to the old? What message did the Union of Soviet Republics have for the capitalistic world?

But there was disappointment. There was only one message for the capitalistic world: "Come and trade with Russia. We welcome foreign capital. The capitalistic and communistic social systems are different, but they can work together."

The remainder of the address was a defence of the communistic order and the painting of a laudatory picture of Russian progress. He admitted that agricultural and industrial production were above pre-war figures, called into question later by Loucheur and mistrusted generally here. There was no favoritism to any group in the community.

Sokolnikoff having failed to reach expectations, rumor soon had it that his colleague, Obolenski-Ossinski, head of the delegation, would fire the hot shot. And he did. He raked the capitalist system fore and aft, accused it of anomalies, of causing the World War, of impotence to handle the economic situation effectively. Even the most ardent apostle of "capitalism rampant" had to admit that some of his criticism caught chinks in the armor of capitalistic states, though he failed to carry conviction that communism's armor was free from flaws, or that the communistic system had handled or could handle the present economic situation more effectively.

As a transitional plan he suggested eleven steps for the re-establishment of trade:

1. Cancellation of war debts.
2. Increase of wages of industrial workers.
3. Introduction of the eight-hour day for all workers, with six hours in mines and "similar industries."
4. Fullest liberty for trade union organizations and complete liberty for strikes.
5. "Real" measures for relief of unemployed.
6. Raising of unemployed relief funds by taxation.
7. Decrease of unproductive expenditure, particularly in armaments.
8. Abolition of all barriers against emigration and immigration.
9. Cancellation of all systems of protectorates and mandates and recognition of rights of all peoples to self-determination.
10. Suspension of all measures of intervention in China.
11. Suspension of all measures of economic boycott against Russia and re-establishment of relations with her so that she can obtain credit needed for her development, the capitalists in turn securing concessions.

Undoubtedly his speech and that of his colleague were so eagerly awaited because it is appreciated here that a Russia opened for full trade would be an important factor in European trade and industrial recovery.

LAYTON'S SEARCHING EFFORT

An outstanding effort was that of Mr. Layton and the audience was quick to respond to his searching analysis and clear and convincing exposition. He pointed out that despite the recovery of European production in 1925 to 104 per cent of pre-war and trade to 94 per cent there were 10,000,000 men out of work. But it was false, he maintained, to strive to return to the pre-war status. A new status, a "new equilibrium," is needed, due to the following new conditions:

1. The great increase in industrialization in all countries—a continuation of tendencies visible before the war but much accelerated by the conflict.
2. The development of the United States into a creditor nation, but under conditions different than that of previous capital exporting nations, for while Great Britain, for example, as an exporter of capital, had had a surplus of imports, buying goods from countries she financed, the United States was taking steps to keep out the products of countries she was helping to develop or restore.
3. Alteration in emigration.
4. Alteration of trading relations, due to settlement of reparations and international indebtedness arising out of the war. Debtors had to develop an export surplus and creditors to accept an import surplus.
5. The large shrinkage in Russian trade.
6. Division of central Europe into small economic and political units. New tariff walls to the length of 11,000 km. have been erected, there has been a large waste of capital through duplication of plant as between these countries and a reduction in volume of trade between the fractions of the old Austro-Hungarian Empire and between them and contiguous countries, making necessary difficult trade divisions and adaptations.

More Than 100%

With the applications for exhibit space at the annual convention of A.E.R.A. only four days in the mails, Fred C. J. Dell, director of exhibits, reports,

1927

52 Applications totaling requests for 27,296 sq.ft. of space

against

1926

25 Applications for 10,363 sq.ft. for the same period.

Let's Go

The splitting up and duplication of plant run counter to the sound tendency toward consolidation and specialization which have brought such prosperity to the world. Small economic units, he remarked, were an anachronism.

He declared that plans to meet the new conditions must be based on these fundamental, but very simple principles:

1. The interdependence of the nations of Europe is so close that their economic prosperity must rise or fall as a whole; no nation in the long run can be prosperous through its neighbors' misfortunes.
2. Material well-being can only be achieved by economic production; permanent prosperity will never be achieved within by industries or by communities which pursue a policy of trying to make profits by restricting production.
3. Europe can keep abreast of industrial progress only if her economic organization permits of specialization, not merely between businesses but between nations. This requires substantial reductions in existing tariffs, so that the tide of international trade may flow in greatly increased volume.

He favored development of an organization for continued collaboration of these economic problems.

UNANIMITY ON NATIONS' INTERDEPENDENCE

The summaries of these addresses of these first four days indicate generally the consensus of opinion of the delegates and foreshadow the conclusions that may reasonably be expected in the ultimate resolutions. Surely the world will not lack now for an understanding of its economic difficulties.

Chief unanimity is found in the thesis of the interdependence of nations, particularly of those in Europe. At the same time nationalism asserts itself, the small nations, for example, demanding that they be not exploited by international combines of the greater nations, and Italy giving notice that if her people cannot emigrate she will have to set up tariffs to develop new industries for keeping her people employed.

Second in order is agreement that tariffs must be stable and that customs, nomenclature and classification must be simplified and standardized. Theoretical statements are common to the effect that tariffs must be lowered, but one detects reservations and hedging. But such reduction would seem a logical tendency after the easier remedies had been applied and had been operative for a number of years.

On the third most important point, the advisability of international industrial combines, selling agreements, etc., covered by the term cartels, there is hardly unanimity. In general they are accepted as a sound and logical international development rising out of international industrial consolidation. But there are reservations of many kinds. The Americans will disapprove if governments are participants in these international combines if they are exploitive. The socialist and Christian labor unions and Loucheur demand some sort of control mechanism to prevent exploitation of workers and consumers, Loucheur's scheme being a bureau of information, observation and publicity. The non-industrial nations fear exploitation by the industrial powers working in concert. Italy fears their effect in the crystallization of industry, due to a lack of competition, and emphasizes the harmfulness of such crystallization to the nations which "have not yet completed their economic industrial growth."

So while agreements may be looked for on removal of trade barriers, action on international cartels is problematical. Another week will tell the tale.

Experts Will Probe Sales Below Cost

The economic effects upon prosperity of taking business below the cost of manufacture will be studied from all angles at the eighth International Cost Conference, which opens in Chicago on June 13.

About 1,000 accounting executives, who gather the data on which industrial and trade operations are based, will attend the conference. The association has 3,200 industrial companies, including the largest in the country, in its membership of more than 4,000. Each of the 30 chapters will send delegates. C. M. Finney, vice-president of the Worthington Pump & Machinery Corporation, is president.

Key System Will Spend $50,000 for Safety Signals

Lester S. Ready, president of the Key System Transit Company, Oakland, Cal., has announced the immediate expenditure of more than $50,000 in the erection of safety signal devices.

Approved by the California Railroad Commission, the safety device being installed by the Key System is the result of research on the part of H. P. Bell, chief engineer of the Key System Transit Company.

The signals are being installed at all the important crossings and the first one was completed April 19 at 40th Street and Telegraph Avenue, Hayward, Cal.

Many Orders for Mack Buses from Electric Railways

Many orders are reported by the International Motor Company, New York, N. Y., from electric railways operating in various parts of the country:

The New England Transportation Company, bus operating subsidiary of the New York, New Haven & Hartford Railroad, has ordered twelve Mack bus chassis, 230-in. wheelbase, four-cylinder motor. Brown Body is building the bodies.

The Iowa Southern Utilities Company, Burlington, Iowa, has purchased four 25-passenger Mack city type buses, 196-in. wheelbase, four-cylinder motor for city service in Burlington.

The Blue Goose Motor Coach Company, Inc., bus operating subsidiary of the East St. Louis & Suburban Railway, East St. Louis, Ill., has purchased three 29-passenger Mack city type buses, 233-in. wheelbase, six-cylinder motor, for suburban operation.

The New York, Westchester & Boston Railway, a traction subsidiary of the New York, New Haven & Hartford Railroad and operating the bus company, County Transportation Company, has ordered twenty more 29-passenger city type Mack buses for operation in Portchester, N. Y. and vicinity. This order is in addition to the five delivered recently.

Six 25-passenger city type Mack buses, 196-in. wheelbase, four-cylinder motor, have been purchased by the Union Transportation Company, bus operating subsidiary of the Oklahoma Union Railway, Tulsa, Okla.

This does not exhaust the list. It is merely typical of some of the outstanding purchases.

Northern Pacific Buys Gasoline Cars

Northern Pacific Railway, Walla Walla, Wash., has ordered three new gasoline-electric cars capable of pulling coaches, according to F. E. Williamson, vice-president in charge of operations. One of the cars will be installed on a run between Seattle and Bellingham and will be a combination coach, while the two others are to carry baggage and mail, pulling passenger coaches as trailers, in North Dakota, also between Staples, Minn., and Oakes, N. D. The new equipment will cost $130,000.

Copper at Lower Prices—Lead Also Down

THE general feeling in the non-ferrous metal market this week is not one of optimism, as silver is the only metal that has given a good account of itself, the price of 57 cents per ounce on May 25 being the highest since April 11, says *Engineering and Mining Journal*. Copper prices have been driven down close to 12½ cents by forced selling; a fair amount of business was secured, but the total was well below average. Lead prices have declined further, but most sellers have found a satisfactory market in other respects. Zinc has refused to break through 6 cents, but cannot be said to be particularly firm. There is little change in tin or the minor metals, though platinum sagged a little further.

The decline below the 15-cent, delivered, level for copper, which began a little over a week ago, gained momentum during the week ended May 25. Some sellers have consistently kept out of the market, but no one seller can be accused of the entire responsibility for the slashing of prices. On Thursday, May 19, there was little doing, but on the next day copper sold all the way from 12⅞ cents, delivered Connecticut, which was the general level early in the morning, down to 12⅝ cents, which was all some anxious sellers could get late in the afternoon. Since then the market has been generally 12⅝ cents in the East, where most of the business has been done. On May 25, however, copper was offered as low as 12½ cents.

Indications are that good buying would appear at 12½ cents, though the recent sharp decline has scared buyers, and has also had a bad effect, so it is said, on brass and wire business.

Little change has occurred in the zinc market this week, both the prices and the volume of sales being about the same as a week ago. Most of the zinc sold has been for May or June shipment and has been booked at 6.05 cents, though as high as 6.10 cents has been paid for a small quantity of July metal that was not sold to a consumer. London has declined each of the last four days, which weakened the market here slightly on Wednesday. Spot carloads of high-grade continue to be offered at 8 cents, delivered.

In the aggregate a fair volume of lead changed hands in the domestic markets during the week ended May 25, although business was unusually dull for one or two sellers. The preponderance of sales were for delivery in the Eastern territory, though much of this was for shipment from St. Louis. The American Smelting & Refining Company reduced its official contract price from 6.65 cents to 6.50 cents on Thursday, May 19, and very little cutting of this price was reported during the week. The price range in the St. Louis market has been wide. The leading interest, until May 25, quoted 6.20 cents, and until the preceding day made sales at that figure. On the other hand 6.125 cents was done on a fair tonnage as early as Friday, May 20. Sales of small tonnages at 6.15 cents and 6.175 cents were also reported; and several sales were made in Chicago at 6.175 cents. The domestic price continues at levels low enough to exclude Mexican ore lead in spite of some decline, especially in futures, in the London market.

Tin prices were slightly higher May 25 than they were a week ago, the improvement of 99 per cent grade being more important. Straits is scarce for prompt delivery, whereas the lower grade metal is available in moderate quantity, which accounts for the unusually wide spread between the two. Buying by consumers has not been important, but speculators and dealers have done a fair amount of trading.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	May 24, 1927
Copper, electrolytic, cents per lb	12.625
Copper wire, cents per lb	15.125
Lead, cents per lb	6.485
Zinc, cents per lb	6.40
Tin, Straits, cents per lb	67.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.10
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.50
Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.75
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.50
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.63

Estimates place the world's visible supply at the end of May at about 1,000 tons above the corresponding figure for April 30, an increase in shipments from Banka being the principal factor in enlarging the supply.

Rolling Stock

East St. Louis Railway Company, St. Louis, Mo., is reported as having ordered, early this month, six new cars. This company placed in service six completely rebuilt cars on May 11.

Street Railway Properties, Phoenix, Ariz., shortly will purchase a number of one-man, pay-as-you-enter cars due to the passage of a $750,000 bond issue by the municipal authorities on April 30, referred to recently in the Electric Railway Journal. According to law 30 days must elapse before the bonds are marketable.

Track and Line

Kansas City Public Service Company, Kansas City, Mo., is about to lay track on Main Street from Third to Ninth Street and on Grand Avenue from 22d to 24th Street. The new work will increase the total amount of trackage laid since the dismissal of the receivership last October to 8 miles.

Saginaw Transit Company, Saginaw, Mich., has embarked on a general program of track rehabilitation. Work at present is centered on South Michigan Avenue. near the Michigan Central crossing. After completing this the crews will tackle the following jobs: East Genesee from Warren Avenue to Hartsuff Street, Court Street, Warren Avenue, Sixth Street and Wadsworth. Aside from the general track repairing, the company is co-operating with the railroads that are crossed in repairing, raising and paving the crossings.

Trade Notes

The Dayton Manufacturing Company, Dayton, Ohio, announces the opening of a New York Office at 918 Havemeyer Building, Church Street. This office will be in charge of Joseph Leidenger, vice-president.

The White Company, Cleveland, Ohio, has devoted issue No. 73 of its house organ, the *Albatross*, to a novel presentation of the White cars that bind motor transportation with nationally advertised products. The magazine is profusely illustrated and includes pictures of the trucks of 57 companies that own more than 9,000 White trucks and buses.

New Advertising Literature

The National Machinery Company, Tiffin, Ohio, has placed in the mails "National Forging Machine Talk No. 61."

Ohio Brass Company, Mansfield, Ohio, is mailing out a new valve folder describing its O-B line of standard globe valves.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 4, 1927 *Number* 23

Comfortable Seats Increase Car Earnings

FARE box receipts are of necessity the acid test of policy on an electric railway property. But it is often difficult to calculate exactly the financial effect of any particular innovation. Determination of the dollars and cents value of comfort and attractiveness in car design is an instance of this kind. Every one knows in a general way that passengers prefer attractive cars and comfortable seats. How strong is this preference? Before spending money on rolling stock improvement, the prudent manager wants to know that he will get back a fair return on his investment.

Recently twelve of the newest cars on a large electric railway in an Eastern city were reconditioned, equipped with leather bucket seats and linoleum floor covering and repainted outside in a different color. During the day these cars furnish about half of the service on the line where they are operated, and during rush hours about one-quarter of the service. Revenue per car-hour for the entire line averages approximately $4.75, while that for the new cars alone is approximately $5.50. Thus the improved cars are earning 75 cents per hour more than the general average, and about a dollar an hour more than the older cars. It is significant that the revenue of the comfortable cars is above normal for that particular line, while that of the others remains about the same as it has been for some time past. The difference in revenue therefore represents a definite traffic increase due to the improvement.

The foregoing instance is unusual only in that the relation between cause and effect is so clearly discernible. Advance calculations of this relationship are difficult, if not impossible, but the electric railway industry now has had enough experience with attractive cars to convince the doubtful that money spent in rolling stock improvement is a dividend-paying investment.

Are Convention Exhibits Worth the Costs?

AT A GATHERING of street railway men that assumes the magnitude of the annual convention of the American Electric Railway Association, the necessity for exhibits is so obvious that it would hardly need stressing, were it not that there are some manufacturers who still believe an intricate piece of mechanism can be promoted adequately in the abstract by means of a high-powered sales talk. The majority of us want to see and to examine. We want, if you please, an outward visible sign that the machine or appliance can actually perform what its builder claims. Further, we want to discuss the merits of this or that mechanism with our co-workers, whose opinions we respect. And last, but not least, we want to take back to our superior officers something besides speeches and resolutions.

Convincing arguments in favor of exhibits are found in a short review of the attendance records at the exhibits and exhibitless conventions of the association. Excluding the years 1917 and 1918, when the war prevented any exhibits, the records stand as follows:

Year	Convention City	Registration	Manufacturer Company Members	Number of Exhibitors	Total Space Sold, Sq.Ft.
1916	Atlantic City	3,271	208	125	57,329
1919	Atlantic City	3,166	206	157	62,219
1920	Atlantic City	3,300	200	136	59,529
1921	Atlantic City	1,189	225	No exhibit	No exhibit
1922	Chicago	4,200	244	141	61,895
1923	Atlantic City	4,404	274	162	75,681
1924	Atlantic City	5,804	330	192	86,349
1925	Atlantic City	7,147	371	204	100,030
1926	Cleveland	8,623	423	271	119,007

Is this not reason enough for asking: Is the exhibit worth its cost to the manufacturer? Take the tabulation for 1920, when there were 3,300 registrations with 136 exhibitors and 50,529 sq.ft. of space sold. Compare this with 1921, when, through fear of the financial depression, no exhibit was held. Look at the convention registration and then glance at these same figures for 1922. Thus there is ample justification for bigger and better exhibits.

Radio Interference Complaints Are Annoying, but Result in Better Maintenance

CAUSES and remedies for radio interference brought out lively discussion at a meeting of the New England Street Railway Club held in Boston on May 12, as told in this paper last week. It was generally agreed by those present that this added responsibility must be assumed by the electric railways and that most of them now are making every possible effort to eliminate causes of radio interference.

Although the receipt of numerous complaints from residents along electric railway lines is annoying to the electric railway officials, the correction of the troubles, after the real reason for the disturbance has been found, affords an excellent chance for the railway to build good will among its patrons. Where some part of the railway equipment is at fault, location of the cause of radio interference results in a higher grade of maintenance and in some cases avoids troubles which eventually would prove serious.

Experience of those who discussed the subject of causes for radio interference at Boston shows that the interruption of small currents is the most disturbing factor. The greatest amount of interference to radio reception appears to be caused by currents of such small intensity that their interruption causes sparks rather than arcs. Interference from the ordinary heavy current flows over wires and tracks, if the circuits are in good condition, should be negligible.

Disruptive discharges which may be termed accidental are very hard to trace. These include many types of leaks or grounds which are increased by atmospheric or wind conditions. Such arcing is usually intermittent and may be caused by tree grounds or the swinging and vibration of overhead lines. Interference which comes from arcing of motors, trolley wheels, broken bonds, defective contacts in automatic electric track systems, signals and the like lead to investigations and remedies which ultimately prove of advantage to the electric railway.

It appears that the tendency of radio listeners has been toward the use of more sensitive sets, and many have tried to increase the distance at which they can hear programs over their sets by using some form of "superhet," either factory made or of home construction. In many cases such attempts have resulted in an increased amount of noise and interference and the listeners have directed their attention to causes which appeal most naturally to them. That is, to the operating electric railway company in their vicinity.

Many railways now have specially organized departments where complaints are received, and where experienced men investigate the causes, then analyze and tabulate these for future use. The signal department of the United Electric Railways, Providence, R. I., now has this work on an organized basis. Complaints are received by letter, telephone, and through the radio department of other local utilities. Data obtained are put on a regular radio form. A number is assigned and the form is then forwarded to an inspector in charge of this department. Complaints are taken up in order and every method is used to locate and clear up the trouble. Out of 76 radio complaints investigated it was found that 40 per cent were due to leaking insulators and bare feed wires in trees, 25 per cent to leaking caps and cones, 20 per cent to trolley pick-up, 5 per cent to local lighting companies, and 10 per cent to owners' sets. It thus appears that interference caused by some defect on the company's system can be remedied without difficulty.

Buffalo Should Help, Not Hinder, Its Railway

REPORT has it that the Public Service Commission is about to use its good offices in an effort to effect an amicable settlement of the matters that have long been at issue between the city of Buffalo and the International Railway. This is indeed good news. It is perhaps true that the railway has not been without blame for the situation there, but its sins of omission and commission must at least be considered in the light of the uncompromising attitude of political forces which have been in control in Buffalo.

It has been necessary for the company at times to fight, and fight hard, but this attitude seems in large part, at least, to have been forced upon it by the city administration, aided and abetted by some of the local newspapers. The situation is best instanced by criticisms directed against the company by one of the local commentators for its stand with respect to increased fares, its insistence on the right to run one-man cars, and its opposition to making street improvements considered to be unduly burdensome.

There is nothing wrong *per se* in an application for an increase in fares. Perhaps the company has hewn too closely to the line of its rights and has not done all that is possible to win public interest in its needs. But the fare matter is an issue that ought to lend itself to settlement on the basis of the economic and financial factors that govern. As for the reference to the one-man cars, it is unfortunate for the critic to designate that vehicle as unpopular. The stand of the opponents of the railway rather than that of the railway itself is arbitrary on this matter, for the International is by no means alone in its advocacy of one-man operation. Hundreds of other companies have found it not only expedient, but a successful method of providing satisfactory transportation at minimum cost. In the matter of street improvement, which apparently involves the question of paving, the city of Buffalo should recognize that the tendency as indicated in five states and more than 60 cities has been more and more to apply car fares toward improved transportation service and not to paving city streets.

As indicated before, the company has perhaps not been altogether without blame, but its attitude with respect to the matters just reviewed and its indisposition calmly to sit by and contemplate the entrance of competition are not without justification from the standpoint of self-preservation, and also on the score that the things it seeks have led to the best results elsewhere, not only for the railway but for the community and its citizens. It is to be hoped that the practice of resorting to corporation baiting tactics in Buffalo is at an end, and that the company thus may soon be put on its mettle under circumstances and conditions that will permit it to function properly.

What One Industrial Operator Thinks About Transportation

USE of automobiles by industrial workers has been the subject of frequent discussion. Recently an industrial operator was commenting on this problem and in general decried the additional expense which factory workers were thus assuming, as being an unfortunate condition not to the liking of the management.

However, he saw a possible excuse in the local situation. This was the unsatisfactory service given by the street railway passing the factory. He said that the cars lacked the comfort, speed and general attractiveness to which the industrial worker as well as the balance of the riding public had been educated. When questioned further it appeared that the service and equipment offered was neither better nor worse than it had been for the past decade or more, but relatively it was far inferior to the present day conception of modern transportation.

Observation of the street railway system readily revealed the fact that it was about on a par with many other properties. The same kind of cars were in use on the same kind of track, maintained to about the same condition that prevails in three-quarters of the properties throughout the country. The same loading standards also were used and the cars upon arrival at the plant and when leaving at night had standing passengers whether ten cars or 30 were needed to provide the "service." Occasional complaints of overcrowding, lateness or bad ventilation were made, often to the industrial management, which in turn entered complaint to the car company. The impression was created that such complaints were only partially adjusted. The whole situation was summed up by the remark by this industrial operator that "If we attempted to run our business and offer as little service as the street railway we would be out of business in three months."

These remarks are a reflection not only against this particular railway but also to some extent against the whole industry. Often it has failed to recognize or respond to this general condition. True there has been serious financial embarrassment with which to contend, but the fact still remains that a large portion of operations are stabilized today. This same large portion is offering standardized service today as it was twenty years ago—but standard to what? Certainly not to conditions to-day. The industry is serving a new public. Just as the youth of today are fearlessly setting new standards of living that make the older generation often stand aghast, just so have the demands changed in transportation. If the people of today are to be sold, common carrier service must be produced on today's specification.

Worthy Prizes Encourage Valuable Suggestions

IN THE present era of prize awards can be heard a voice of the Roman past, "Give, I pray, rewards worthy of my ability." In answer thousands of dollars are awarded for artistic furniture designs, realistic short stories and convincing advertising slogans and posters. Nor have the utilities taken minor rôles in this movement. Prizes totaling $300 will be awarded every 60 days throughout the year by the Chicago, South Shore & South Bend Railroad for the successful efforts of employees in obtaining new business for the company. Another example is on the Chicago, North Shore & Milwaukee Railroad, where prizes ranging from $10 to $250 were awarded to 76 employees for securing new passenger and freight business. In Saginaw, Mich., citizens were recently awarded prizes by the utility there for the best essays on "The Value of Street Car and Bus Service." Again, in Buffalo the International Railway offered gold prizes in a competition for high school art students. It is expected that many of the designs submitted will be used in the cars of the system within the next few months. The Georgia Power Company has given prizes to its railway employees for essays on "What service do we owe the passenger for his fare?"

So the old order changeth. In the past, speaking broadly, prizes have been offered most frequently in safety contests. Now the employee is encouraged to use his imagination as well as his hands. May the prize contests fostered by the railway companies continue, with the managements amenable to honest suggestions and the patron and employee responsive to rare opportunities. Moreover, let the winners have prizes worthy of their ability.

Increasing Toll Among Street Workers

EMPHASIS is well directed that is placed on the hazards that attach to men engaged in work done by the electric railways in the streets. It is of course true, as a correspondent of the JOURNAL points out, that the subject has been touched upon many times in association work, but the problem seems to be how best to proceed to bring the matter to the attention of the public authorities and how to punish offenders who ignore barriers. Record could be piled upon record to show the seriousness of this matter, but the case of the Denver Tramway is typical of the experience of other companies. In that city, between February, 1923, and March 16, 1927, inclusive, seventeen men of the company were seriously injured, two of whom died as a result of being struck by automobiles while engaged in trackwork in the streets. Think of it! Really some of the instances of recklessness on the part of motorists that have been cited by representatives of various companies stagger one at the heedlessness of the average driver.

Men must on occasion work in the streets. There is no getting away from that. The devices which the companies have adopted for protection appear well nigh to have exhausted human ingenuity, but they are apparently of little avail. There is no need to cite them, but it is not amiss to say that frequently three or four men are employed to protect a similar number while at work, all because the average motorist is so heedless.

The problem is not alone that of the track department. It is the problem of every man connected with an electric railway anywhere. The managements are almost at their wits' ends over the matter, and any man anywhere who can advance a suggestion that will materially reduce the hazard to employees engaged in street work will do his fellow employee and humanity a real service.

It is, of course, important that adequate punishment be meted out to the driver who handles his machine recklessly, but that is second to the matter of devising preventive measures more efficacious than any that have yet been devised. Punishment after the offense, however, will not restore to usefulness a man who has been seriously injured, nor will it restore life to one who has been killed. As the JOURNAL has pointed out before, there is apparently no complete answer to the question, but the more the problem and its solution are discussed the more likely it is that the hazard will be diminished. The matter is, of course, complicated by the increasing multiplicity of machines and by the fact that more and more does the automobile come into the hands of the reckless, the incompetent and the financially irresponsible.

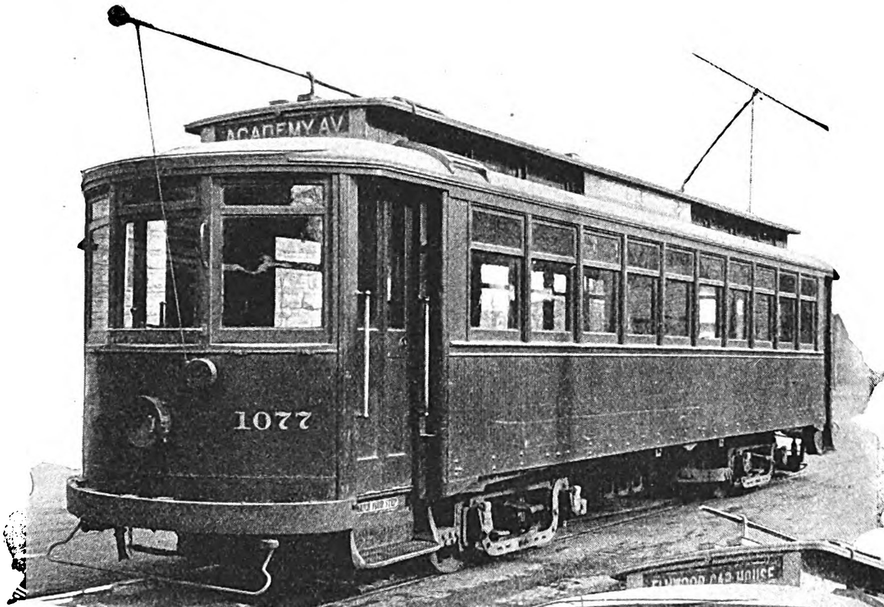
Just as Dead as If He Were Wrong

TO BE right is not enough. As a speaker at a recent meeting of electric railway men pointed out, it is not always wise for a public utility company to maintain its rights too vigorously. He referred to the man who "was right, dead right . . . but he's just as dead as if he were wrong." Of course it is important to be right, but being right, the company often can gain more by waiving its right than by insisting upon it.

If the time limit of a transfer has expired a street car conductor is technically right in refusing it. When the passenger has honestly misunderstood the restrictions on the use of a transfer, however, the railway would do better to accept it with a polite explanation of the rules than to refuse it and make a permanent enemy of the passenger. When some one boards the wrong car despite the conspicuous display of a correct destination sign it is the poorest kind of policy to chide him for his mistake or inquire rudely if he cannot read. Rather should it be the railway's endeavor to put him on the proper car to reach his objective.

Multiplication of instances of this sort would be easy. Usually the company is actually right and the passenger in the wrong. To emphasize his mistake or "teach him a lesson" only antagonizes him. If this is the habitual attitude, the company soon earns the ill will of a large part of the public and eventually is likely to find himself just as dead as if it were wrong.

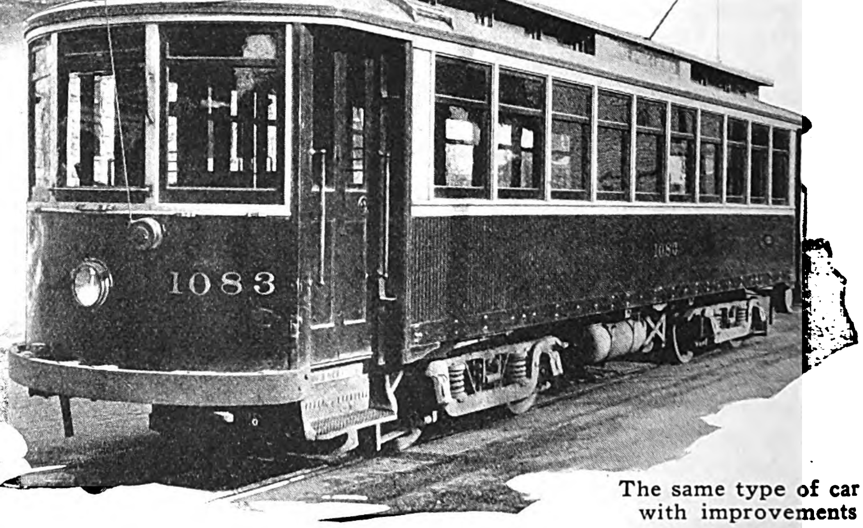
Good Service in Attractive Cars Increases Riding



Suburban car before rehabilitation

By E. J. Dickson
Vice-President
United Electric Railways,
Providence, R. I.

Passenger revenue of the United Electric Railways, Providence, R. I., increased 2.3 per cent from 1923 to 1926 despite extraordinary depression in business conditions and increased automobile registration of 46 per cent



The same type of car with improvements

PROPERLY to understand the results that have been obtained through the use of new and more attractive rolling stock on the lines of the United Electric Railways, Providence, R. I., it is necessary to consider several phases which have a direct bearing upon the results obtained. The railway operates practically all the electric car mileage in Rhode Island. During the five-year interval from 1920 to 1925 the population as shown by the federal and state census increased 74,863, or 12.39 per cent, an average of 2.48 per cent per annum. During the years 1923 to 1926 inclusive there was a gain in automobile registration of 45.79 per cent.

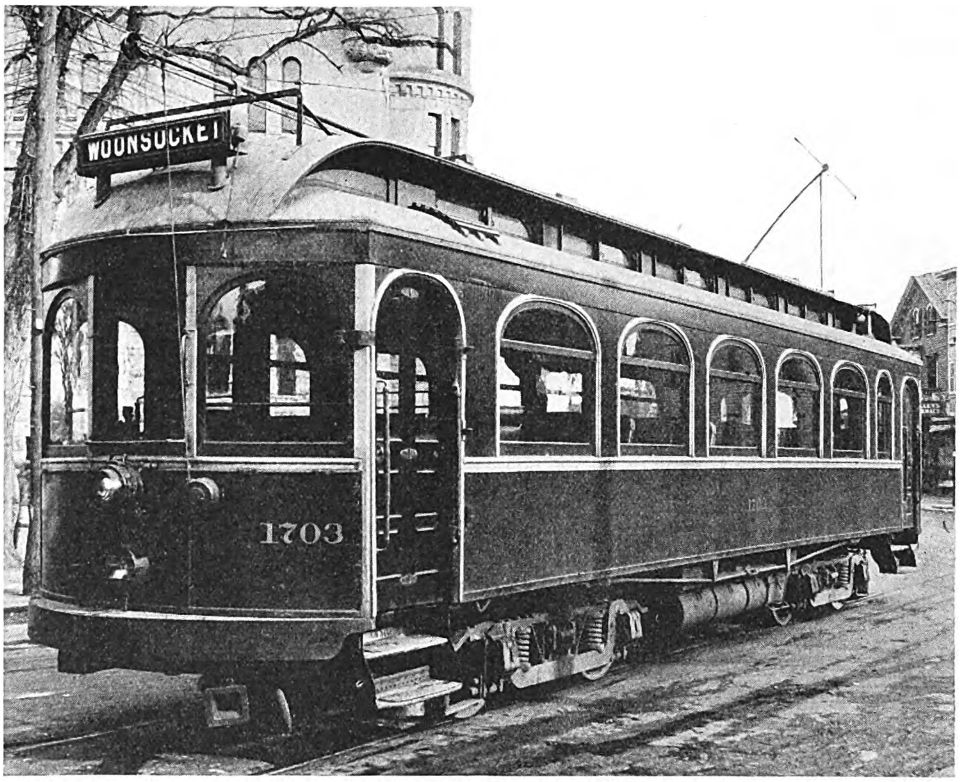
Most important in the state, considered commercially, financially, in size of plants and number of employees, is the textile industry. This alone gives normal employment to 85,000 wage earners. There are approximately 196,000 persons engaged industrially in the state, so that those employed in textiles constitute nearly half of the total. During the past four years the textile industry in New England has suffered an extraordinary depression. The intensity of that depression was most pronounced in 1926. Due to the large number of persons engaged in the textile industry, it is obvious that the barometer of business conditions fluctuates according to the state of business in textiles.

As this business suffered so extensively during the past four years, one might reasonably suppose that the electric railway revenues would decrease correspondingly. This was not the case, however, as is shown by the financial statements of the company, as follows:

Year	Gross Earnings
1923	$8,006,202.21
1924	8,179,322.41
1925	8,159,446.59
1926	8,193,345.17

The expansion in service and use of equipment to give greater convenience and comfort is shown by several changes which were made. The United Electric Railways instituted bus operation July 3, 1922, and has extended this operation to a very considerable extent up to the present. This service has been a contributing factor toward increasing gross receipts. In addition, on Jan. 1, 1924, and again on May 27, 1924, fares were increased and several zones were extended. This caused a considerable loss in traffic, but the revenue remained about stationary. Progressively since Dec. 31, 1922, the company has purchased 235 cars of the most modern city type, 210 of them being double-truck cars designed for one-man or two-man operation.

During 1926 the company instituted a program for improving the appearance of its equipment by the adoption of a more attractive color scheme. Cars are being painted to the new standard as they go through the shops for general overhauling. The company has also devised a plan for rehabilitating the best of its older equipment by improving interior and exterior decorations, illumination and seating. Some of the results achieved in connection with this program of improvements are indicated in the accompanying illustrations. Car 1703 is one of the high-speed interurban type used on the Providence-Woonsocket line. The original interior mahogany woodwork was refinished and the ceiling was painted a light cream. The seats, previously upholstered in plush, were recovered with Spanish grain leather. All cars on this line have been similarly rehabilitated.

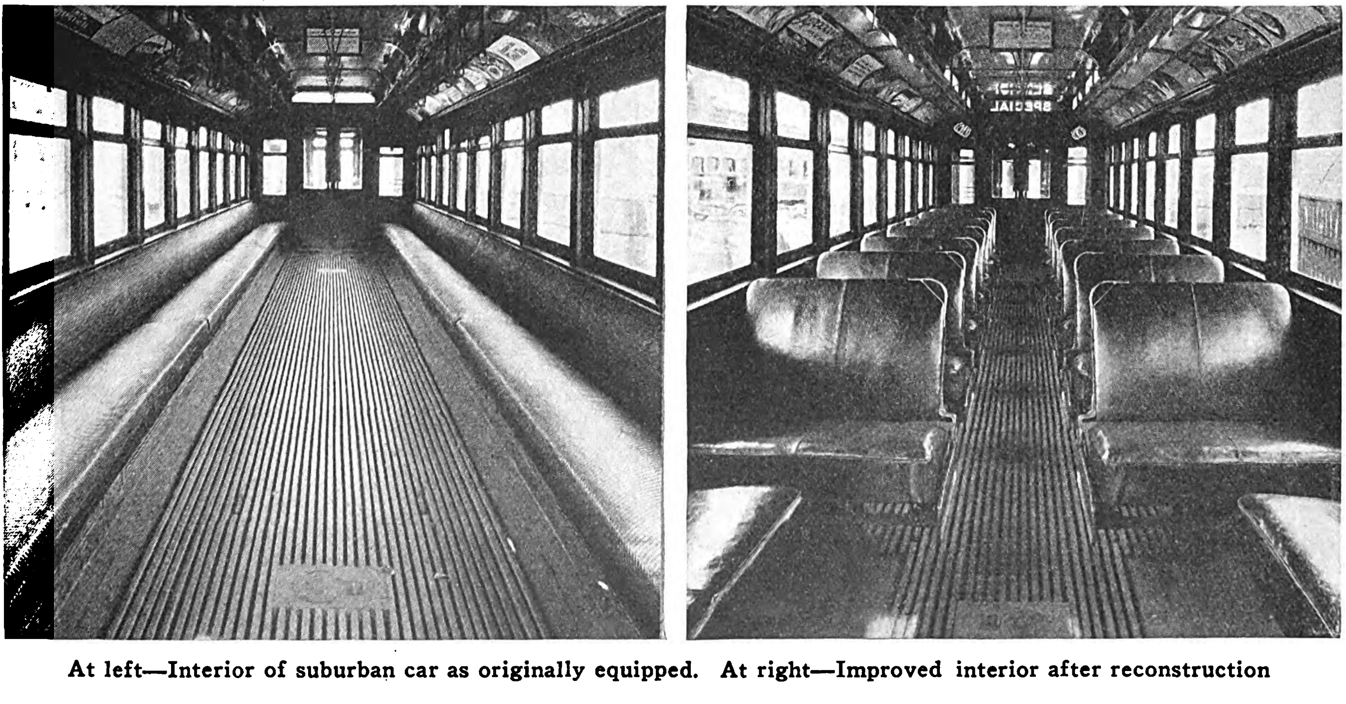


Exterior of one of the Providence-Woonsocket high-speed interurban cars after remodeling

Car 1083 is one operated on the East Greenwich suburban line. The improvements made in exterior appearance can be seen by comparing this with car 1057, with which it was originally identical. The interior of the remodeled car is provided with cushion leather seats. The ceiling is painted cream color and white enameled Rico handstraps have been installed. The interior woodwork also has been refinished and varnished.

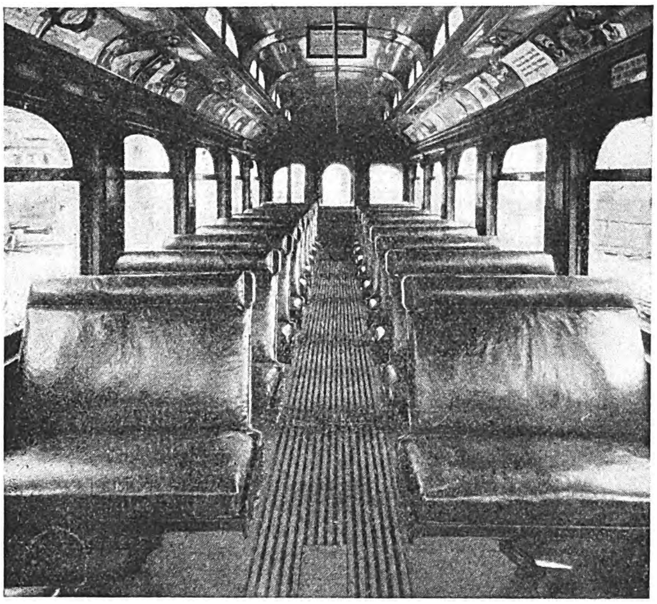
Besides purchasing 235 new cars and rehabilitating many others, this railway has been engaged diligently in other respects during the past four years. Many miles of track have been rebuilt. Sections of double track have replaced single track and single-track sidings have been lengthened. Automatic signals and electric track switches have also been installed liberally.

The power supply of the railway has been improved radically so that it is now giving excellent results. Frequency and regularity of car service have been established to such an extent that favorable comment has been received both from patrons and from the local press. Material financial economies in cost of operation



At left—Interior of suburban car as originally equipped. At right—Improved interior after reconstruction have been effected in all departments of the company and each department has responded with better efficiency.

Referring to the question as to results which can be attributed directly to better appearing cars with greater conveniences and comforts, I do not hesitate to state that, notwithstanding all the other agencies employed to attract patronage, it is my firm conviction that had not the United Electric Railways undertaken the purchase of new cars, improved the appearance and convenience of others and strengthened its track facilities the gross earnings of the company would by no means be where they are today.



Interior of car No. 1703. Seats have been re-covered with Spanish grain leather

You cannot sell shabby material to self-respecting people in these days. Unless good service is provided in attractive and comfortable street cars the ordinary citizen will purchase his own vehicle, or use the one he may already possess, instead of suffering the inconvenience resulting from irregularity of service or the humiliation of riding in dilapidated equipment. I believe that profitable street car patronage can be had in any community where such facilities are provided and if good service is given in attractive cars. These factors have been most helpful in our situation.

Lexington Capitalizes Magnetic Brake

THE Kentucky Traction & Terminal Company, which operates the car lines in Lexington, Ky., on a 100 per cent one-man basis, has recently employed a novel method for advertising the air magnetic brake which is part of the equipment on its rolling stock. A signboard suspended from the roof of each car from one end to the other and on both sides carries a slogan featuring the braking equipment. Some of the outstanding slogans are: "World's First Air-Magnetic Brake Car," "America's Model Railway—Air-Magnetic Brake," "Ride Electrically—Stop Magnetically," "Magnetic Brakes—Our Original Development," "Your Guard to Safety—America's First Combination Brakes."

Make Your Experience Pay Dividends

See the Maintenance Competition announcement on page 1006

Pressure Shower Bath Speeds Up Car Washing

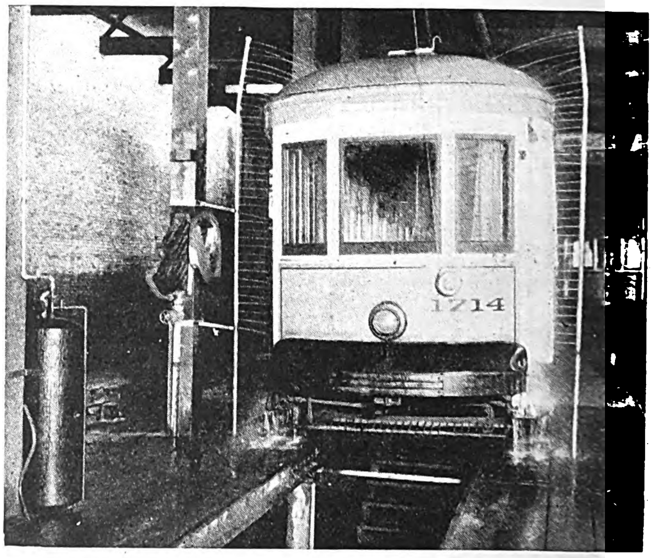
CAR-WASHING time has been cut in two at the Grand Avenue shops of the Connecticut Company, New Haven, as a result of the use of a pressure shower bath. The advantages of this method of cleaning the car exteriors was recognized some time ago, but it was found impossible to secure sufficient pressure from the city water mains to do the job properly. To overcome this difficulty J. E. Dooley, master mechanic, has devised apparatus whereby the shop compressed air system is used to force water through perforated pipes against the sides of the car.

A car air tank has been installed in a vertical position alongside the washing track. This is connected through a check valve to the city water supply. Outlet is provided through a second valve to two vertical 1-in. pipes, one on each side of the track. These pipes have $\frac{3}{32}$-in. holes spaced 3 in. apart. At the top they have been bent inward to direct the water onto the car roof.

Shop air is admitted into the top of the tank at about 80 lb. per square inch pressure. The check valve in the water feed line prevents water being forced back into the main. Thus the whole contents of the tank, about 41 gal., is driven out through the openings in the pipes.

This quantity of water is sufficient to spray a car twice. The first spraying wets down the sides and roof. Car cleaners then scrub them down with a cleaning mixture, using long-handled brushes. After that the car is run through the shower a second time for rinsing. A bleed valve in the tank releases the air and allows it to refill with water, a process requiring about 60 seconds. During this time the washed car is being taken away and a dirty car brought up.

Two men constitute a crew for this work. One runs the car while the other operates the shower. Each brushes down one side of the car.



Washing car in Connecticut Company shops

Compressed air admitted into the top of the tank at the left forces air out through perforated pipes against the side of the car.

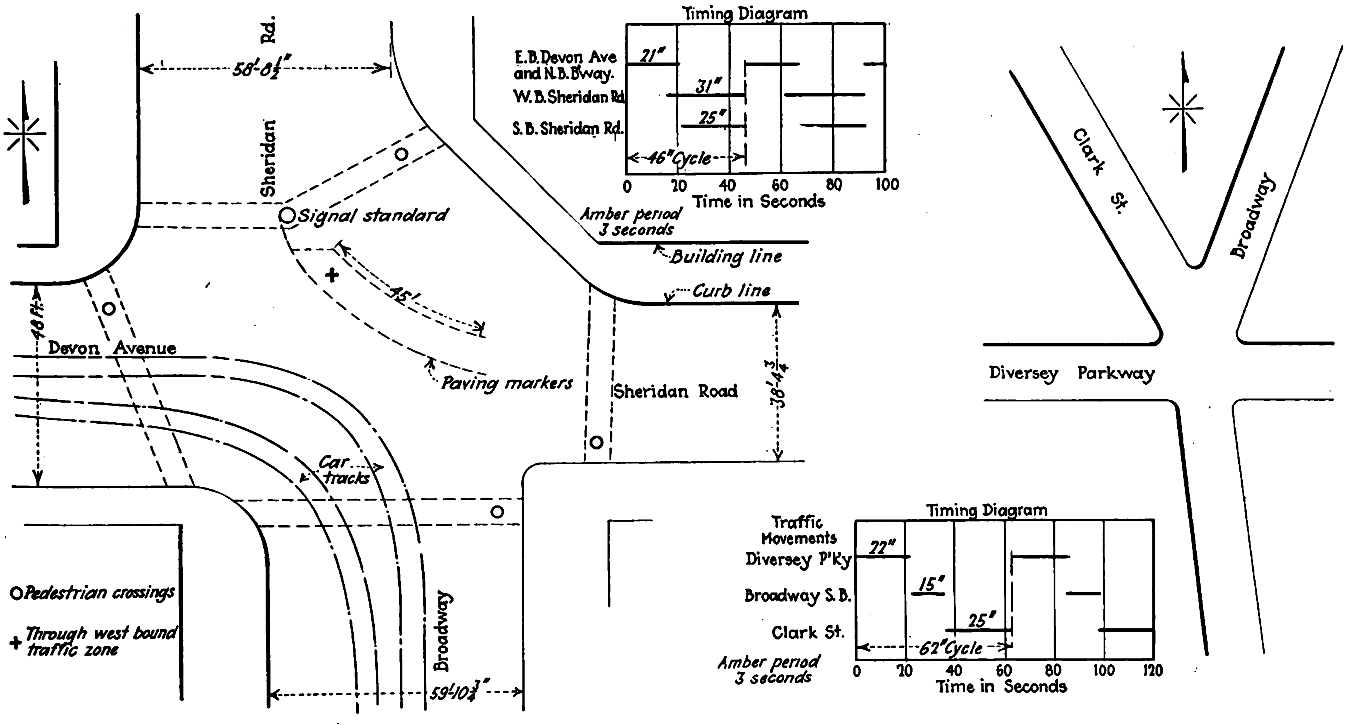
Washing the roof every time the sides are washed has proved to be good policy. This prevents the accumulation of dirt that may later run down the sides during a rain storm, giving the car a streaked appearance.

Traffic Signals Fitted to Complicated Intersections

Special methods of signal control are employed at complicated crossings in Chicago to increase flexibility of traffic movements, reduce interference and cut delay at intersections

By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines

REGULATION of traffic is in principal demand where streets cross or intersect. These intersections are indispensable, but under heavy traffic conditions they become points of obstruction to traffic flow. Consequently, some form of regulation and control becomes necessary to give ease and safety of movement with minimum delay. This can only be accomplished by considering all of the factors in each situation and designing the control system to meet the specific set of conditions encountered. The growing inadequacy of city streets to handle the traffic volume which continues to increase at a rapid rate makes it necessary to adopt every available means of expediting the movement of vehicles over the principal lanes of travel. The principle of the greatest good to the greatest number must govern traffic control under such conditions even though it becomes necessary to restrict less important movements and to eliminate certain conveniences that were permitted under less congested conditions. Elimination of cab stands and vehicle parking near heavy traffic intersections is often a necessary step. Left turns should also be prohibited when they add confusion out of proportion with the convenience which their retention affords.


Sheridan Rd.
58'-8½"
Signal standard
45'
Devon Avenue
48 ft.
Building line
Curb line
Paving markers
Sheridan Road
38'-4"
Car tracks
Broadway
59'-10½"
Pedestrian crossings
Through west bound traffic zone
Timing Diagram
E.B. Devon Ave and N.B. B'way.
W.B. Sheridan Rd
S.B. Sheridan Rd.
21"
31"
25"
46" Cycle
0
20
40
60
80
100
Time in Seconds
Amber period 3 seconds
Clark St.
Broadway
Diversey Parkway
Timing Diagram
Traffic Movements
Diversey P'Ky
Broadway S.B.
Clark St.
22"
15"
25"
62" Cycle
Amber period 3 seconds
0
20
40
60
80
100
120
Time in Seconds

Special methods of handling traffic at complicated intersections

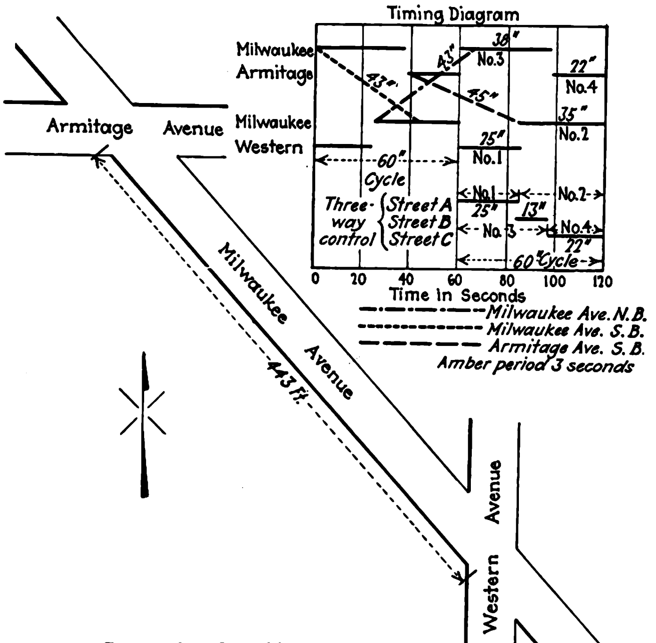
At the left—Traffic control arrangement designed to meet special conditions encountered at Devon Avenue, Sheridan Road and Broadway intersection in Chicago. Half the southbound traffic makes a west turn and 90 per cent of westbound vehicles turn right. The special method adopted to move this traffic is explained in the text of the article.

At the right—Intersection of Broadway, Clark Street and Diversey Parkway in Chicago. Both Broadway and Clark Street carry car lines and heavy vehicular traffic. Diversey Parkway is a heavily traveled boulevard. The scheduled sequence of the signal cycles used here is all-important to cutting down interference and delay.

To render these intersections most serviceable, enforced traffic restrictions must be combined with a method of control that will provide ease of movement with minimum time waste. Control by a traffic officer may be superior to mechanical control if the officer appreciates the time saving which results from short traffic change intervals and can give his full attention to this work. However, custom requires that traffic officers answer questions and enforce regulations. These demands, coupled with the common tendency to give long movements and wait for vehicles approaching the intersection widely spaced, decrease seriously the efficiency of manual control. Greater flexibility, less conflict of vehicles and a smaller time waste can be obtained with mechanical control at many intersections than would be possible under manual operation. This is particularly true at some of the complicated intersections encountered in a large city, which in the case of Chicago run through a wide range of conditions. Some of the special control installations now used or proposed in Chicago are designed for the following situations: Two or three streets intersecting at one point; closely related intersections on a heavy traffic street; three streets intersecting within close range but not at a common point.

SPECIAL CONTROL FOR UNUSUAL CONDITIONS

When two or more streets intersect at a common point and when the traffic arriving is not influenced by any near-by control system, the problem is one of giving proper consideration to traffic volumes on each street, the street widths and the prevailing directions in which the traffic must be moved through the intersections. This must be done in a manner to expedite the major traffic streams. Time must also be allotted in the control system to permit the movement of the minor traffic in a manner to give the greatest possible efficiency to the intersection.



Control of adjacent crossings co-ordinated

The intersections of Armitage Avenue and Western Avenue with Milwaukee Avenue in Chicago furnish an example of the interconnection of closely related crossings. The movement of street cars on all three streets controls the speed of the traffic stream due to the narrow streets and parked cars.

At certain intersections the predominating movements suggest a departure from the usual method of permitting traffic to flow in both directions at the same time on a given street. Such was the case in Chicago at the intersection of Broadway, Devon Avenue and Sheridan Road. An accompanying illustration shows a diagram of this intersection, the widening of which will be completed this summer. Here the two principal movements arrive southbound and westbound on Sheridan Road. Approximately half of the southbound traffic makes a left turn, while more than 90 per cent of the westbound vehicles make a right turn. The desirability of permitting these two streams to move simultaneously is supported by the ease with which the two remaining movements are combined. Twenty-five per cent of the northbound Broadway traffic, including street cars, turn left at this intersection, while essentially the only demand of eastbound traffic is for a right turn.

With the widening out of the northeast corner ample space will be made available for a through westbound traffic zone to be located as shown in the drawing. Vehicles will accumulate in this zone while Sheridan Road movements are running and will continue west with northbound left turns from Broadway. Such minor movements as left turns both east and west and through movement eastbound are prohibited. The intersection is so located that these restrictions cause very little inconvenience. A time cycle of 46 seconds for this location was determined by the 2¼-mile progressive signal system on North Broadway as part of which this intersection will operate.

CONTROLLING A THREE-STREET INTERSECTION

Another special control which falls under this classification is at Clark Street, Broadway and Diversey Parkway. This is a three-street intersection at which Broadway terminates. Here both north and south streets carry car lines in addition to heavy vehicular traffic. Diversey Parkway is a boulevard. A drawing of this intersection is shown in an accompanying illustration.

Under manual control two movements were given to traffic at this intersection, one for Diversey Parkway and the other for both Clark Street and Broadway. With this arrangement traffic southbound on Broadway conflicted, first, with vehicles northbound on Clark Street and then forced its way in with traffic southbound on Clark Street. Much delay arose from this interference.

With mechanical control and shorter intervals it was necessary to eliminate the conflict. This was done by using three-way control equipment timed as shown in the illustration. Here the scheduled sequence of the signal movements is all-important in cutting down interference and delay of the traffic streams. Starting with a 22-second movement on Diversey Parkway, followed by a fifteen-second period for southbound Broadway, the cycle is completed with a 25-second movement in both directions on Clark Street. By following Diversey Parkway, the short period allotted to southbound Broadway traffic permits faster speed and assures greater freedom from interruptions than if it were preceded by Clark Street, where northbound vehicles moving at a slower speed and passing the south side of the intersection during the amber period might frequently delay the Broadway traffic a large portion of the fifteen seconds allotted. Regulations prohibiting left turns to and from Diversey Parkway and eliminating parking on Clark Street from Diversey Parkway to Dole Street, one block south, were established while the intersection was under manual control and are continued at present.

This special method of control has eliminated all conflicting movements and permits much faster speed over the intersection than was formerly possible. A notable improvement over manual control has been observed.

When an important thoroughfare is intersected by streets only a few hundred feet apart and when traffic at these intersections warrants mechanical control much time waste may result if the controls are operated independently. Such conditions are found often on diagonal streets which frequently carry important car lines and much vehicular traffic. Generally, interconnection of control can be employed to advantage where the intersections are sufficiently closely related and where distances and intervening conditions permit a consistent running time for the traffic between intersections.

In Chicago eight such combinations are now in service. Mechanical control equipment operating two or three intersections on car line streets and boulevards has brought about a considerable time saving and a more uniform movement of vehicles. On Milwaukee Avenue there are two such groups, one of which is explained below.

Milwaukee Avenue, an important business and car line street, is crossed by Western Avenue running north and south and again within 500 ft. by Armitage Avenue, an east and west street. In this group of crossings heavy through traffic on Milwaukee Avenue demands first consideration. The intersecting car line streets, particularly Western Avenue, require a fair allotment of time to accommodate a moderately heavy cross traffic. Between these intersections the average running time of street cars was found to be 43 seconds in both directions on Milwaukee Avenue and 45 seconds for Armitage Avenue cars turning south on Milwaukee Avenue.

Here street cars control the speed of the traffic stream due to the frequency of car movements and the narrow roadway on which parking is permitted. Observations of running time include the period required to transfer passengers at the outgoing intersection. That is, the observation begins when the car leaves the first intersection and is concluded when it is ready to leave the second intersection.

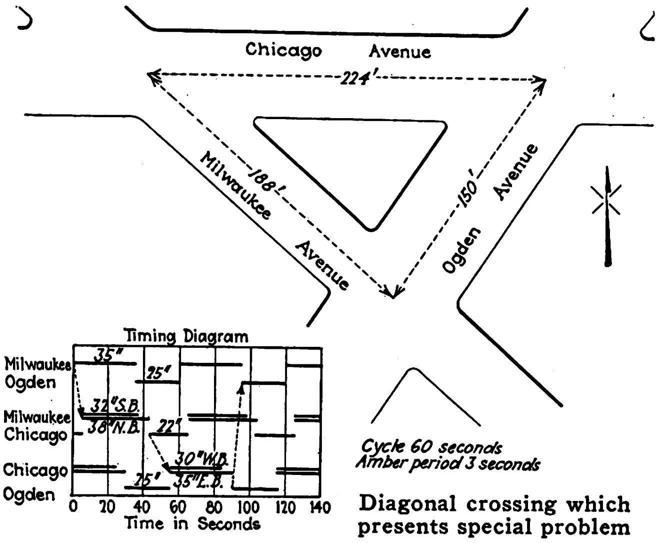
Applying this running time to the graphical timing diagram shown in another illustration it is found that southbound Milwaukee Avenue cars starting at the beginning of the movement at Armitage Avenue are ready to leave near the middle of the Milwaukee Avenue movement at Western Avenue. If this 43-second running time is now applied to a car northbound on Milwaukee Avenue starting with the "Go" signal at Western Avenue, the car will be ready to leave at Armitage Avenue eight seconds after the northbound movement starts. The graph also shows the movement for a branch of the Armitage Avenue car line which makes a right turn from east to south and continues down Milwaukee Avenue.

In this installation the intersections are timed to meet the individual needs of the various traffic streams and yet so related that movement at one intersection is given at the proper time to receive a wave of traffic from the other. An interesting feature of this installation came in the use of the common three-way control equipment to give this progressive movement. As shown in the graph this was accomplished by timing the controller 25 seconds on "A" street, thirteen seconds on "B" street and 22 seconds on "C" street and then making electrical connections to give movements at both intersections as shown. It should be noted here that the instant of change of traffic flow at one intersection need not coincide with the change at any other. Completely flexible control apparatus is usually necessary to permit such a fortunate combination of traffic flow. This arrangement, which is one of two such groups on Milwaukee Avenue, has controlled these intersections with notable smoothness for some months.

THREE ADJACENT BUT NOT COMMON STREET INTERSECTIONS CONTROLLED

Small islands are sometimes formed by three streets which intersect within a few hundred feet of a common point. When only two of these intersections need mechanical control the method just described may be used to advantage, but when heavy traffic requires mechanical control at all three crossings, interconnection with proper timing permits a freedom of movement impossible with separate controls.

When a distance less than 300 ft. separates these intersections, the resulting small reservoir capacity between crossings practically demands mechanical control of a type which will prevent accumulation between the crossings greater than the street space will handle. In a situation of this kind the signal changes will be governed chiefly by the traffic volumes to be accommodated at each intersection and the running time and temporary storage capacity between intersections.



Diagonal crossing which presents special problem

Still another traffic control situation is represented by this set of crossings in Chicago. Although the three crossings are adjacent, they are not common, and require the signal control to be worked out to meet the conditions encountered.

An example under this classification is the control soon to be installed at Chicago, Milwaukee and Ogden Avenues. At this location the first two streets carry important car lines and heavy vehicular traffic. Ogden Avenue is a boulevard. An accompanying illustration shows the arrangement of the intersections and a graphical timing diagram of the signal system.

Traffic on Milwaukee Avenue requires the largest time allotment, while Chicago Avenue follows next in importance. Small street space between intersections on Milwaukee Avenue northbound, Ogden Avenue southbound and to a lesser degree on Chicago Avenue eastbound makes necessary movements at the outgoing intersection on each street of sufficient length and so timed with respect to the incoming intersection that these small reservoirs will be emptied after each movement.

The graphical timing diagram shows how this was accomplished. A 35-second movement northbound on Milwaukee Avenue at Ogden Avenue is given a 38-second clear period, starting five seconds later at Chicago Avenue. An eastbound Chicago Avenue movement of 22 seconds at Milwaukee Avenue is given 35 seconds, starting twelve seconds later to clear at Ogden Avenue. Ogden Avenue flow at both intersections is of 25 seconds duration, but a five-second advantage is given the southbound movement at the outgoing intersection to prevent backing up of traffic which would interfere with Chicago Avenue.

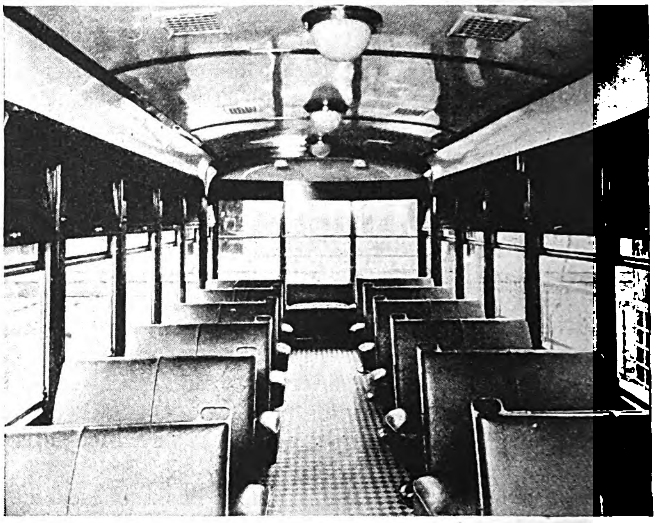
The other movements can readily be taken from the diagram. To prevent overloading of the reservoirs on the island side of the streets, the control on Milwaukee Avenue at Chicago Avenue and Chicago Avenue at Ogden Avenue must govern each direction separately. Therefore, where this flexibility is given in the timing diagram movements in each direction are shown independently. Proper vehicle flow is obtained by separate connection of lights on the two sides of certain of the signal standards. This measure of flexibility offered by mechanical signal control can be used to advantage at many intersections. Even though the control equipment required to give this flexibility is often costly, the time saving obtained is frequently worth many times the expenditure.

The Chicago, Milwaukee, Ogden Avenue group of specially controlled crossings is one of four such combinations in Chicago varying in distance between intersections up to 1,170 ft., where properly connected mechanical control has made possible conspicuous time saving and a more uniform traffic movement. The special methods of control mentioned or described here were developed for the city of Chicago by the Chicago Surface Lines.

New Cars for Jamestown Street Railway

Eight New One-Man de Luxe Safety Cars Purchased—Attractive New Color Scheme Adopted—No Expense Spared in Making These Cars the Latest in Car Construction

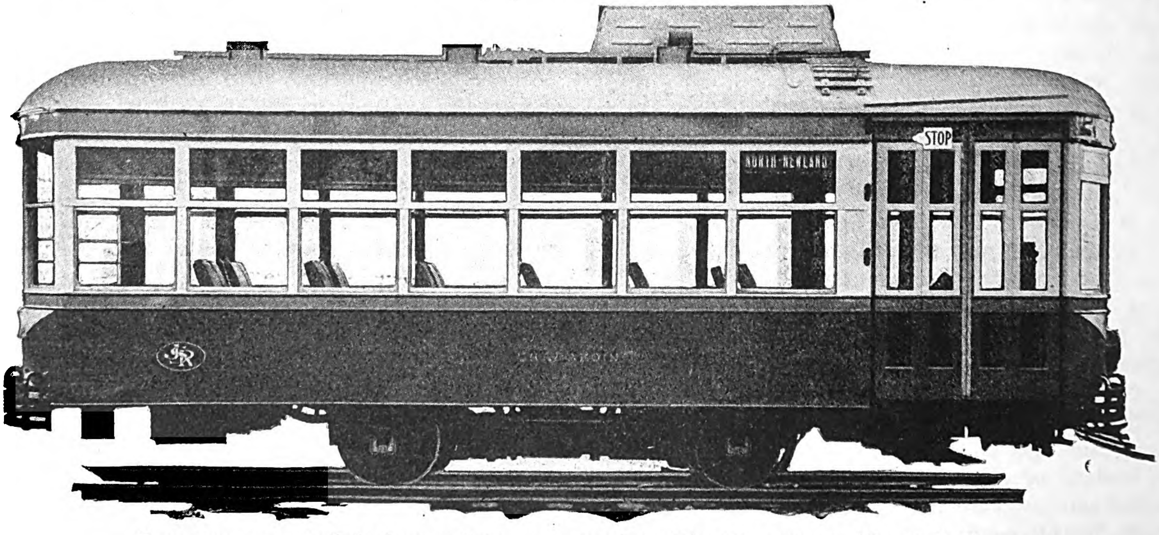
FULL realization of the importance of modernization of equipment to obtain increased patronage and reduced maintenance expenses caused the Jamestown Street Railway, Jamestown, N. Y., to purchase eight new one-man de luxe safety cars for city operation. It is anticipated that the attractiveness of these cars, together with the high class of service they will render, will result in a marked increase in revenue.


The arch roof, center-dome lighting, Spanish leather seats, and inlaid rubber tiling floor covering create a pleasing interior in the Jamestown cars

These cars, with their convex sides, round ends, arch roof and generally pleasing appearance, are expected to receive the unqualified approval of the public. Many new features are incorporated, one of which is the harmonizing color scheme. This consists of a pyramid gray body with a blue belt rail, desert sand letterboard and cream sash, all being blocked off by a horizontal black stripe. This combination of colors, together with the gray roof and black trucks, gives a pleasing appearance.

The cars were built by the St. Louis Car Company, St. Louis, Mo. Mahogany interior finish with white veneer headlining and gray trim afford a cheerful and restful effect. The broad, heavy upholstered welted seam seats with deep spring cushions and padded backs are covered with genuine Spanish leather, providing comfortable riding space for two persons. The cars have twelve stationary cross seats for two passengers each, one stationary longitudinal seat for one passenger, and a continuous seat across the rear end. Thirty passengers can be seated comfortably. Ample knee room is provided by the spacing of the seats at 31-in. centers.

The floors are covered with inlaid rubber tiling, giv-



One-man-operated de luxe safety cars purchased by Jamestown Street Railway

EQUIPMENT USED ON NEW JAMESTOWN CARS

Type of car	Passenger safety, single truck
Seating capacity	30
Weight, total	19,000
Length over all	27 ft. 7 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	11 ft. 11 in.
Body	Semi-steel and Plymetl
Interior trim	Mahogany
Headlining	Veneer
Roof	Arch
Air brakes	Westinghouse
Axles	4 in. heat treated
Bumpers	Four bar spring steel
Car signal system	Faraday
Car trimmings	Bronze
Compressors	Westinghouse DH-16
Conduits and junction boxes	Duraduct
Control	K-63G
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	Natl. Pneumatic
Energy-saving device	Economy meters
Fare boxes	Johnson
Fenders	HB lifeguards
Gears and pinions	General Electric
Hand brakes	Peacock
Headlights	Golden Glow..SM95
Journal boxes	St. Louis Car Co.
Lightning arresters	Westinghouse type K3
Motors	Two 265A, inside hung
Paint	Johnston
Safety devices	Safety Car Devices Co.
Sanders	two front, one rear
Sash fixtures	"Rex" brass
Seating material	Spanish leather
Slack adjuster	Gould
Springs	St. Louis Car Co.
Step treads	Kass
Trolley catchers	O.B.
Trolley base	U. S. 20-A
Trucks	St. Louis No. 7
Ventilators	Peerless
Wheels	Steel, 26 in.

ing a safe and comfortable footing for the passengers. Its colors blend softy into those of the car interior. This tiling also acts as a sound absorber to deaden truck noises. Six Peerless ventilators installed on the roof, three on either side, are fitted with grille and register. The cars are heated with individual double-coil truss plank heaters and the temperature is regulated by thermostatic control. One cab heater is also installed for the comfort of the operator and is supplied with a separate control.

Practically every type of safety device has been incorporated in these cars, including an emergency exit door on the left side at the extreme rear. Large folding selectively controlled air-operated doors permit of easy and unobstructed entrance and exit. When the door is open a stop sign attached to the exit door acts as a warning to approaching vehicles that passengers are alighting. The cars are provided with brilliant interior illumination, there being three Brascolite two-lamp dome fixtures on the ceiling, two rear platform lights, and two door lights, besides the usual farebox, sign, tail and head lamps. As an added feature, a stop light on the rear dash shows red when the air brakes are applied. Motor rheostats, usually installed beneath the car floor, are installed upon the roof. Suitable metallic covering permits of proper ventilation and prevents entrance of rain and snow.

All platform control apparatus is inclosed in mahogany cabinets, creating a neat and clean platform appearance. The large section plate-glass windows in the vestibule assure an unobstructed view at all times. The seven large windows on the right side of the car and the nine on the left side, with cross-bar window guards, provide a clear, unobstructed vision without danger of injury from passing cars.

A decided departure from the usual method of numbering has been adopted. Each car is named after an Indian chief whose name began with the letter "C." The names decided upon were Chautauqua, Chadakoin, Conewango, Chippewa, Cayuga, Cattaraugus, Cassadaga and Canadohta.

Some of the principal dimensions and data on the eight new cars are shown in the accompanying table.

Enviable Service Records in New York State

NEW YORK STATE RAILWAYS, Rochester lines, boast a total of 321 employees with 25 years or more of service. The oldest employee in point of service is Joseph W. Hicks, assistant to the president, with 60 years to his credit. Next in line comes his brother, Thomas, with 48 years. Third in rank is Dominic Rick, a workman with the railways for 45 years. Two motormen, James A. Behan and John Lynch, have been piloting cars in Rochester for 40 years. W. J. Whalen and Cole R. McCracken lead the list of conductors with 36 years of service each. In the executive class there's Donn Byrne, assistant treasurer, 42 years on the payroll; Benjamin C. Amesbury, superintendent of transportation, 37 years; F. D. Livernash, division superintendent, 37 years, and Bert E. Wilson, general passenger agent, who has chalked up 35 years.

Store Check at South Bend Shows Popularity of Railway

OUT of 25,863 customers checked at five leading stores at South Bend, Ind., on Saturday, March 19, 16,479, or 63.8 per cent, used public transportation vehicles. Those who came by street car represented 56.2 per cent of the total, while those coming by interurban and bus were 2.1 and 5.5 per cent respectively. Automobile users were 19.4 per cent and walkers 13.6 per cent. Figures showing by two-hour periods the number of users of each type of transportation are given in the accompanying table.

MEANS OF TRANSPORTATION USED BY SOUTH BEND STORE CUSTOMERS

Hours	Street Cars	Int. Cars	Bus	Auto	Walk	Bicycles	Buggy	Taxicab	Skates	Motorcycles	No Reply	Total
9-11 a.m.	1,762	40	184	281	304	2	1	...	..	..	56	2,630
11 a.m.-1 p.m.	2,695	79	290	548	600	4	4	...	..	..	114	4,534
1-3 p.m.	2,912	133	333	1,305	772	9	2	1	1	..	207	5,676
3-5 p.m.	4,249	199	337	1,927	1,252	7	5	1	2	2	290	8,271
5-7 p.m.	2,908	88	270	966	591	1	1	...	..	..	127	4,952
Total...	14,526	539	1,414	5,027	3,519	23	14	2	3	2	794	25,863
Per cent	56.2	2.1	5.5	19.4	13.6	..	..	0.1	..	..	3.1	100

High school girls wearing orange ribbons with the inscription "C., S. B. & N. I. Ry. C." were stationed at the store doors to make this check. As each customer entered, inquiry was made concerning the means of transportation used in reaching the store. This information was noted on a slip, which was then deposited in a box provided for the purpose.

Some skepticism was felt by the railway management about the wisdom of making the count on a Saturday. It was feared that the proportion of car riders might be rather small because those who stopped work at noon could go home, get out the automobile and take the whole family down town shopping. The results shown by the check were extremely gratifying to the management, although it was felt that a week day would have shown an even larger per cent of railway passengers.

Since the count was made the company has noted a considerable number of expressions of surprise from merchants and the general public at the large proportion of customers found to be using street cars to reach the stores.

Trackless Trolley Equipped with Pneumatic Tires

DEMONSTRATION of a trackless trolley equipped with large pneumatic tires was recently made before a group of transportation officials in Ipswich, England. The new vehicle received the approval of those present. Features of the vehicle are:

1. Pneumatic tires on all wheels—38-in. x 7-in. single at the front and 38-in. x 7-in. twin at the rear.
2. Springs, specially long and designed to secure easy riding both with the vehicle light and in an overloaded condition, and to meet all conditions of road surface.
3. Body arranged with two compartments, between which is a wide central entrance for passengers with a low loading step. The floor of the vestibule is only 2 ft. 4 in. from the ground level.
4. Seats of the semi-bucket type, luxuriously upholstered in real leather.
5. Improved lighting arrangements in the form of bulkhead-type fittings having powerful electric lamps connected with the main driving circuit.

The chassis has the driving motor fixed within the frame in a position about midway between the front and the rear axles. The driving motor is of the inclosed-ventilated, series-wound traction type, with interpoles, developing 50 hp. on the standard rating of the British Electrical Standards Association specification for traction motors, and is capable of carrying an overload of 100 per cent for short periods.

The controller, which has been improved in many details, has a foot-gear for operating the main drum, while the reversing drum, which is mechanically interlocked with the main drum, is operated by a lever at the right of the driver. The main drum is arranged to give five series notches and one field shunting notch.

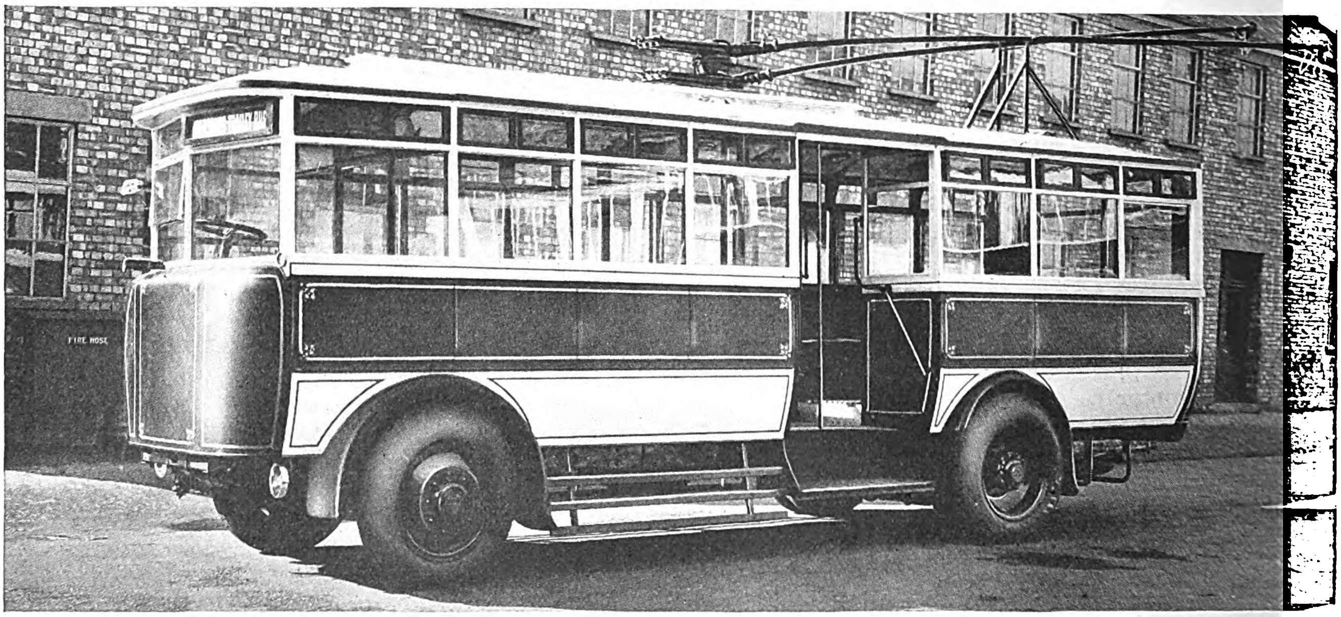
Power developed by the motor is transmitted to the back axle by a floating tubular propeller shaft of special steel, provided with inclosed universal joints at each end, the couplings of these joints, where attached to the motor shaft and to the worm shaft on the back axle, being provided with splines.

The back axle is forged from a steel billet, and is of the basin type for receiving the differential gear. The reduction in speed from the motor shaft to the driving axle is obtained by a specially heavy type of worm gear. At each end of this back axle a massive cast steel bracket is mounted, which carries the extra large brakeshoes and their cams.

Each driving wheel is fitted with two independent internal expanding brakes acting on large diameter drums, One brake is applied by a hand lever of the ratchet pattern, the other is applied by a pedal. Each brake is of sufficient power independently to stop the vehicle under all conditions.

All bearings throughout the vehicle are of the roller type, including those in the motor. With the exception of the worm and differential gear in the back axle, which are lubricated by oil, all other parts where lubrication is required are arranged for grease, nipples being provided at each point for use with a grease gun.

The body, built throughout by Ransomes, Sims & Jefferies, Ltd., has a wide central entrance with a compartment on each side of the vestibule. The front compartment accommodates fourteen passengers and the rear saloon seventeen passengers. There is also a comfortable seat for three passengers on the offside of the vestibule. The backs of the back rests are covered with carpet, which lends a cosy appearance to the interior. The steps to the central entrance are low, and the floor of the vestibule is only 2 ft. 4 in. from the ground level.



Center-door trackless trolley recently developed in England

English oak and ash, naturally seasoned, are used in the construction of the body. The outer panels are of silver steel. The exterior of the vehicle is painted in artistic style and the interior is tastefully upholstered and decorated. The interior panels are embossed to match the leather of the upholstery, and the moldings are French-polished of a rich mahogany shade. The white enameled ceiling with its polished handrails and copper-oxidized lamps and fittings makes a very light finish.

Four roof ventilators are installed and the upper sash of the main side windows are hinged in a vertical plane, opening either forward to induce a current of fresh air, or rearward in order to extract heated air from the interior of the vehicle. Two main side windows in each saloon are arranged to drop.

Schedule Making and Checking

in Los Angeles

The methods used by the Los Angeles Railway follow somewhat unusual lines. The method of procedure from the traffic check to the finished schedule is discussed

SCHEDULES used by the Los Angeles Railway follow the general form of listing car and crew runs, but for many years the practice has been to typewrite the schedules rather than to have them drafted by hand. The upper part of a typical week-day schedule is reproduced. As will be seen, the car schedule is at the left, and shows in separate horizontal divisions the schedules of each car from the time it leaves the carhouse until it returns. The car schedule is broken up into "pieces," as operated by the different crews, each piece being marked with the crew number. In addition there is a condensed guide of work runs at the right side of the sheet, showing the time on and time off for each piece of work for each car.

TRAIN RUN NUMBER KEYED TO SCHEDULE

Information from which schedules are made up is obtained by traffic checks. The schedule department has a corps of ten traffic checkers experienced in this work riding the cars at all times. This plan has supplanted the earlier method of having conductors make traffic counts. To insure reliable counts by the checkers, they in turn are checked by department men who ride the cars.

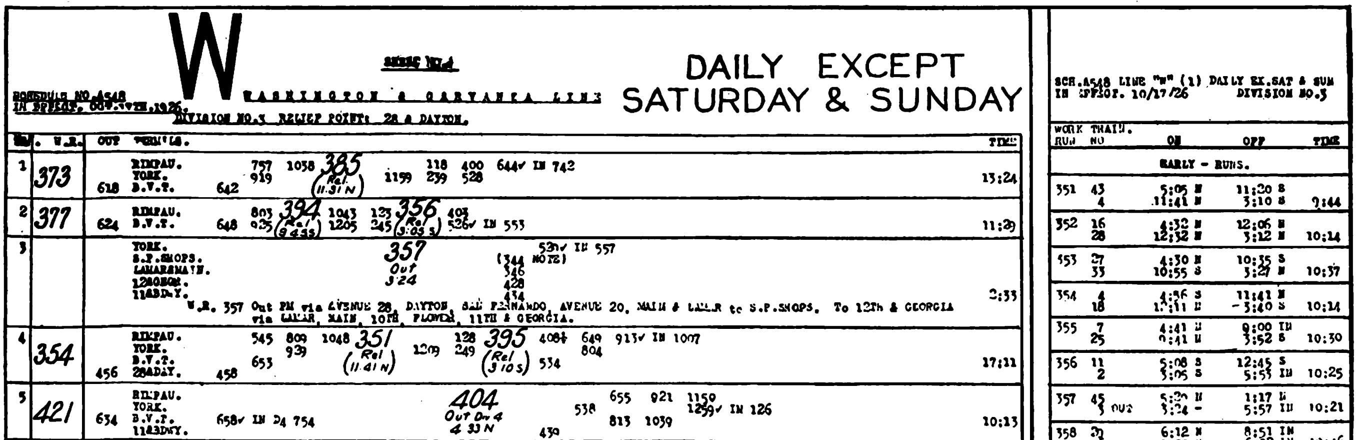
Traffic counts are made on the various lines at points of peak traffic, covering headway and passengers carried. The checker tabulates the car number, train number, destination, passengers and time at which the car passed the checking point. It is upon this information that the revised headway is based.

When these forms reach the office, lines are drawn through the tabulation indicating twenty-minute periods. A summary is then made on a tabulation sheet, giving the total number of passengers carried through a traffic checking point in consecutive twenty-minute intervals, throughout the eighteen hours from 6 a.m. until midnight. This summary is posted on a tabulation sheet. From the tabulation a chart is drawn showing the number of passengers by twenty-minute periods. This assists materially in visualizing conditions on a particular line.

Heavy loads are immediately noticed on this tabulation and chart. With a predetermined standard of service established, it is possible to determine by reference to an arbitrary table just what number of cars should be run in a twenty-minute period to handle the load. If the number of cars as calculated is greater than the number indicated in the table, a revision in schedule is made to improve the service. Traffic checks are continually being made, as the seasonal riding habits of the public require changes in schedule to make the service economical.

Before a change is made in a schedule, however, the running time is checked to determine a proper normal running time upon which the revised schedule may be based. Checkers with experience in operating cars are used in this work. They note the way the motorman handles the car and indicate on their reports the speed of the car between time points. From fifteen to 25 rides are made through a time point before establishing a new running time. After the time for these rides has been averaged, an allowance of 30 seconds is made to give what is known as a normal running time.

Having established a normal running time between time points and between terminals, a schedule is set up based upon the headway as determined by the traffic



W

SHEET NO. 1

SCHEDULE NO. A548
IN EFFECT, OCT. 17TH, 1926.

WASHINGTON & GARVANZA LINE

DIVISION NO. 3 RELIEF POINT: 28 & DAYTON.

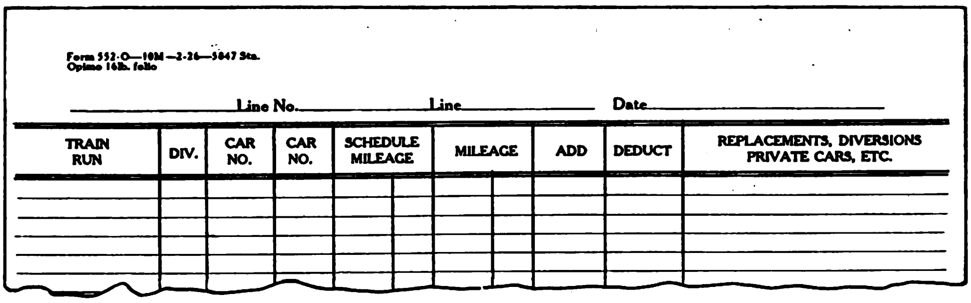
DAILY EXCEPT
SATURDAY & SUNDAY

	T. R.	OUT	TERMINALS.		TIME
1	373	618	RIMPAU. YORK. B.V.T.	642 757 919 1038 385 (Rel. 11.31 N) 1159 118 239 400 528 644✓ IN 742	13:24
2	377	624	RIMPAU. B.V.T.	648 803 935 394 (Rel 9 45 S) 1043 1205 133 245 356 (Rel 3:05 S) 403 526✓ IN 553	11:29
3			YORK. S.P.SHOPS. LAMAR&MAIN. 12&GEORGIA. 11&BDWY.	357 Out 3 24 (344 NOTE) 346 428 434 530✓ IN 557 T.R. 357 Out PM via AVENUE 28, DAYTON, SAN FERNANDO, AVENUE 20, MAIN & LAMAR to S.P.SHOPS. To 12Th & GEORGIA via LAMAR, MAIN, 10TH, FLOWER, 11TH & GEORGIA.	2:33
4	354	456	RIMPAU. YORK. B.V.T. 28&DAY.	458 545 653 809 939 1048 351 (Rel 11.41 N) 1209 128 249 395 (Rel 3 10 S) 408 534 649 804 913✓ IN 1007	17:11
5	421	634	RIMPAU. YORK. B.V.T. 11&BDWY.	658✓ IN 24 754 404 Out Dv 4 4 33 N 430 538 655 813 921 1039 1150 1259✓ IN 126	10:13
6	372	608	RIMPAU. YORK. B.V.T. AV20&PAS. S.P.SHOPS.	615 622 654 812 935 358 (Rel 9 55 S) 1053 1215 133 255 417 535✓ IN 602	11:54

SCH. A548 LINE "W" (1) DAILY EX. SAT & SUN
IN EFFECT. 10/17/26 DIVISION NO. 3

WORK RUN	TRAIN NO	ON	OFF	TIME
		EARLY - RUNS.		
351	43 4	5:05 N 11:41 N	11:20 S 3:10 S	9:44
352	16 28	4:32 N 12:32 N	12:06 N 3:12 N	10:14
353	27 33	4:30 N 10:55 S	10:35 S 3:27 N	10:37
354	4 18	4:56 S 1:11 N	11:41 N 3:40 S	10:14
355	7 25	4:41 N 9:41 N	9:00 IN 3:52 S	10:30
356	11 2	5:08 S 3:05 S	12:45 S 5:55 IN	10:25
357	45 3 OUT	5:20 N 3:24 -	1:17 N 5:57 IN	10:21
358	37 6	6:12 N 9:55 S	8:51 IN 6:02 IN	10:46
359	35 7 OUT	5:34 N 3:53 S	12:52 N 6:07 IN	9:32
360	50	5:41 N	1:27 N	

Schedules used by the Los Angeles Railway are based upon the train number and are typewritten. The work runs are listed at the left

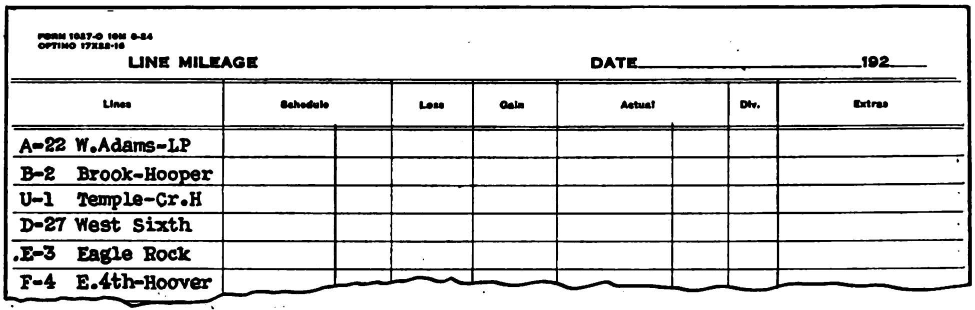


Form 552-O—10M—2-26—5847 Sta.
Optimo 16lb. folio

__________Line No.__________Line__________ Date__________

TRAIN RUN	DIV.	CAR NO.	CAR NO.	SCHEDULE MILEAGE	MILEAGE	ADD	DEDUCT	REPLACEMENTS, DIVERSIONS PRIVATE CARS, ETC.

A daily compilation of car mileage is kept for each car on the system.



FORM 1027-O 10M 6-24
OPTIMO 17X22-16

LINE MILEAGE DATE__________192____

Lines	Schedule	Loss	Gain	Actual	Div.	Extras
A-22 W.Adams-LP						
B-2 Brook-Hooper						
U-1 Temple-Cr.H						
D-27 West Sixth						
.E-3 Eagle Rock						
F-4 E.4th-Hoover						

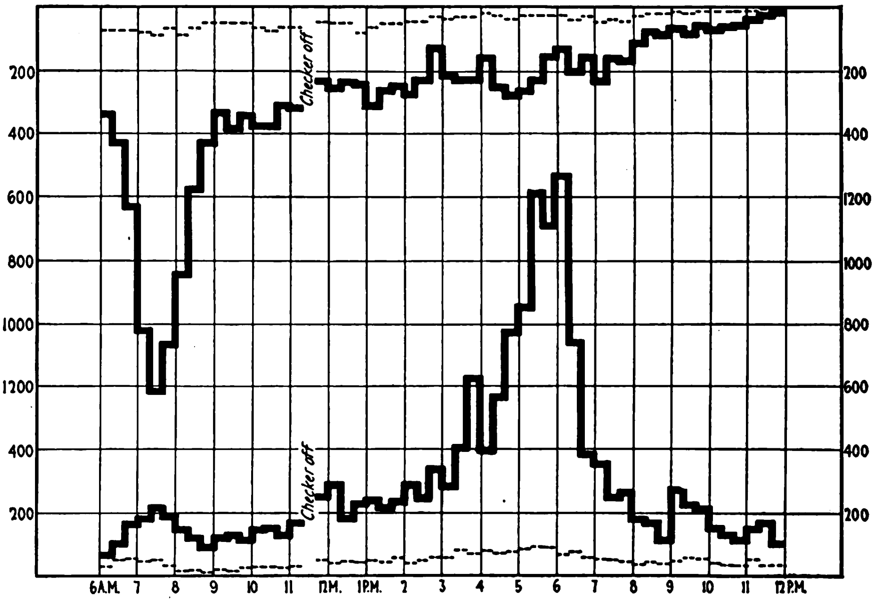
The actual mileage, loss, gain and schedule mileage are given for each line. This includes both car and bus operation

assigned this portion of the run to some work run number and thus has used it. Reliefs for the trainmen are allowed in the schedules. This company has no straight runs; there being at least a twenty-minute relief period at or near the center of the run in order that the crew may have time to eat. An exception is made to this in the case of the late night runs, that of necessity are made straight.

With the runs subdivided and portions assigned to work run numbers, the schedule is roughed out. It will be noted in the illustration showing the finished schedule that space is left for indication of the relief, when it comes on, and the work run number that relieves. The schedule is then typed on heavy bond paper, the work run table being placed on the right-hand side of the sheet, with the numbers listed consecutively. In the main schedule, the train run numbers are listed consecutively. This feature of the schedule makes it easy for the trainman to pick out the times of his work runs from the sheet. Particularly is this useful for the extra man who is given a run and has the allotted seven minutes in which to get his equipment together and copy off the times of his work runs. Checks have been made of the time required to obtain the same information from this form and from schedules not using the train run as a basis. With the Los Angeles system it requires 22 seconds for a trainman to find the two sections of his run and copy off the times. With a schedule in which the train run numbers are not keyed to the work run number, it required more than two minutes. Running time schedules vary with the time of day and are listed at the foot of the schedule. Altogether on the schedule shown there are seven changes in running times during the day in one direction and six in the other direction, though the difference between one time schedule and another may be between two or three points. The schedule shown was put into effect on Oct. 17 and covers the pre-Christmas season.

In setting up the running time in minutes between time points, no time is given between the last time point on the line and the terminal. The most important reason for this is that after a motorman leaves the last time point he is allowed to get to the terminal as fast as possible, taking into consideration safety of operation and courtesy. He will pick up few passengers, stopping principally to let off the few carried beyond his last time point, which usually is the last transfer point on the line. This speeding to the end of the line carries the few passengers left on the car to their destinations rapidly and creates public good will. Although no running time is given there is an established running time for this distance, which is available to trainmen and soon becomes known to them. However, they are permitted to make such time as they please. The time gained is added to the layover period.

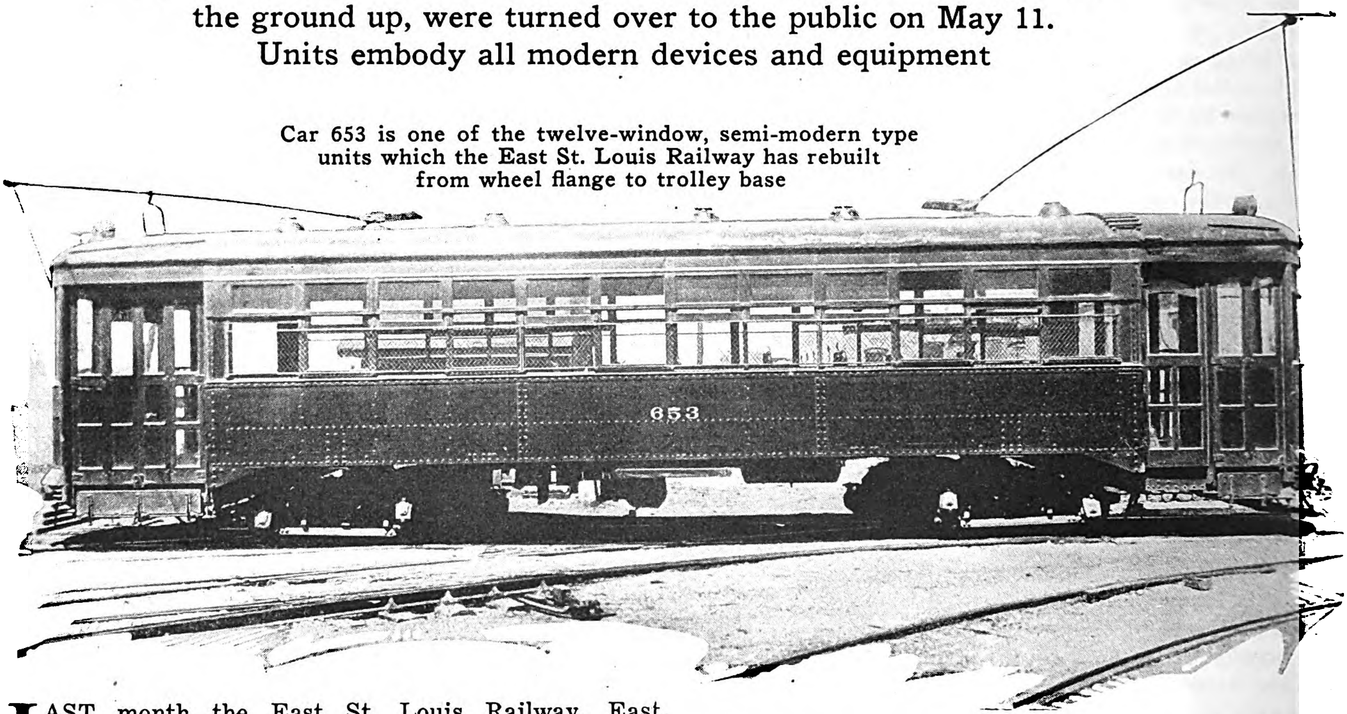
In addition to the work of making up schedules, the schedule department also compiles data on the car and bus mileage. These are made up on a form for each particular line for every day, and show the actual mileage on each individual car. In addition, another form shows the schedule mileage, the loss or gain and the actual mileage for each car line and bus line on the system. This is a daily recapitulation of the individual car and bus mileage sheet.



From the tabulation of traffic checks the usual chart is drawn to visualize the traffic situation. This graph indicates the number of passengers at a particular checking point for a twenty-minute period

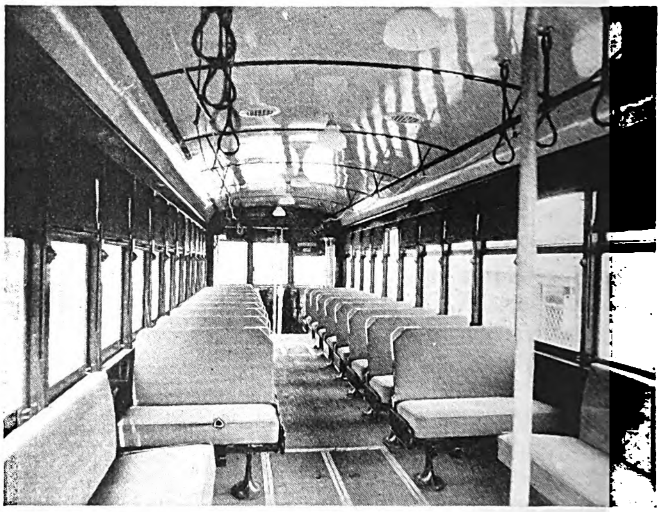
Another Chapter on Popular Transportation

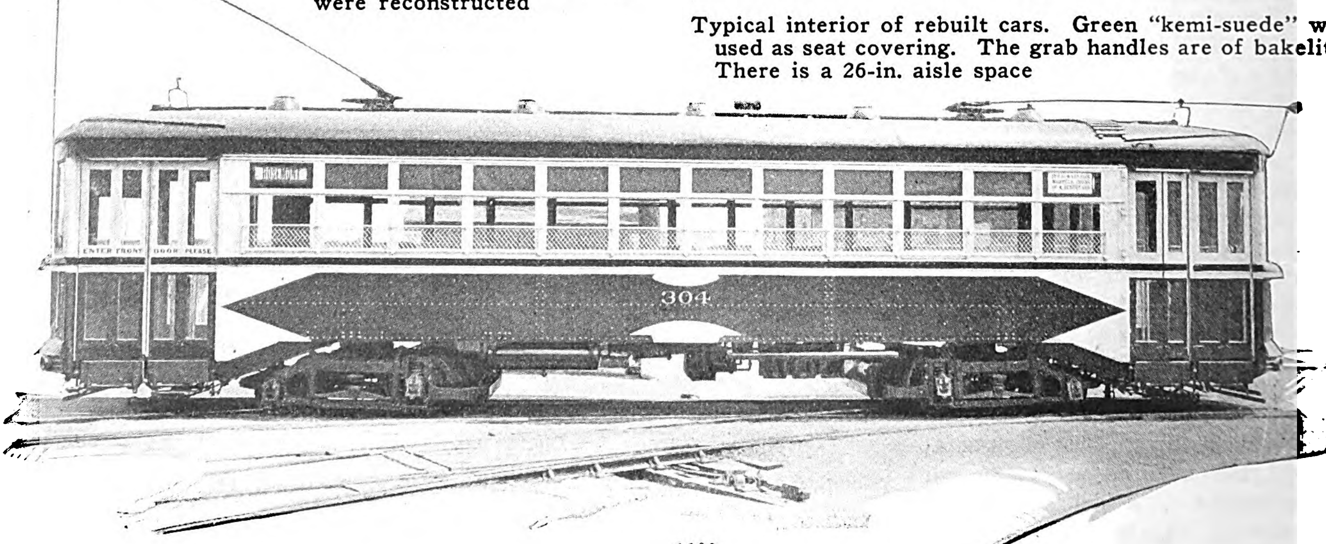
Six semi-modern cars, rebuilt by the East St. Louis Railway from the ground up, were turned over to the public on May 11. Units embody all modern devices and equipment


Car 653 is one of the twelve-window, semi-modern type units which the East St. Louis Railway has rebuilt from wheel flange to trolley base

LAST month the East St. Louis Railway, East St. Louis, Ill., wrote another chapter on popular transportation when six thoroughly rebuilt cars were shown to the public for the first time. The ceremony included a parade of the cars through the business district and over the divisions on which the cars will operate in the future. The units were placed in regular service on May 11. For the purpose of speed and on account of the scope of the reconditioning plan, the work was done in the shops of the St. Louis Car Company.

Modernization consisted, first, in completely stripping the cars, and, after the steel side plates and under frames were examined, the replacing of or welding all defective parts. The original interior finish of dark


Typical interior of rebuilt cars. Green "kemi-suede" was used as seat covering. The grab handles are of bakelite. There is a 26-in. aisle space



Car 304 is the same unit as shown above, ready to be placed in service. Six units were reconstructed mahogany was then refinished to a natural color, all defective parts first having been replaced. The interior metal trimmings also were refinished and headlining was installed. A new seating arrangement, consisting of eight cross seats per car placed on each side, and four short longitudinal seats, is in striking contrast to the old seating plan, which embodied five cross seats on each side of the car front and back, a long longitudinal seat opposite the cross seats and short longitudinal seats at each end on the same side as the cross seats. All of the new seats have deep spring cushions and backs and are covered with green "kemi-suede," a decided improvement over the rattan and wood construction of the old units.

New motors, geared for a speed of from 12 to 13 m.p.h., were installed on all the units; four 25-hp. motors on one unit and two 60-hp. motors on cars with maximum traction trucks. On the four-motor unit complete new wiring, a new light-weight truck and new electrical equipment were necessary, the latter including controllers and line switches. As an experiment the rewiring was done in Duraduct. Each car is equipped with full safety apparatus, including LD-4 devices for the operation of line switches. On each unit there are four air-operated doors; two have treadles and two are hand-operated. The doors are interlocked with control.

From the standpoint of boarding the car, considerable improvement is noted. This is due to the use of smaller wheels and because the unit as originally constructed contained drop platforms. Under the new arrangement the step heights are from 12 to 13 in., with a step from platform to the car body floor of 9 in.

As far as the exterior appearance is concerned, the company's standard orange color was specified as the basis for the new painting. The letterboard is painted orange and the window posts and windows are finished in cream color, below which has been traced a 4-in. black band, edged with old gold. In addition there is a 2-in. cream strip below the black band. This sets off a large orange colored panel which comes to a wedge point at the door posts. There are slight figures in the center of the panels to relieve the monotony. All parts are edged with black. By pointing the end of the side panels a streamline effect is obtained. Cream color has been used for the upper part of the doors, and the lower portion is finished in orange with the black and gold strip to match the decorative scheme of the car body. This treatment also obtains on the ends of the car. With the new headlight placed in the center of the dash, the orange panel effect has been extended to the dash, and brought to a wedge point at the headlight. Red was selected as the color for the car roof, with the under part finished in dark green.

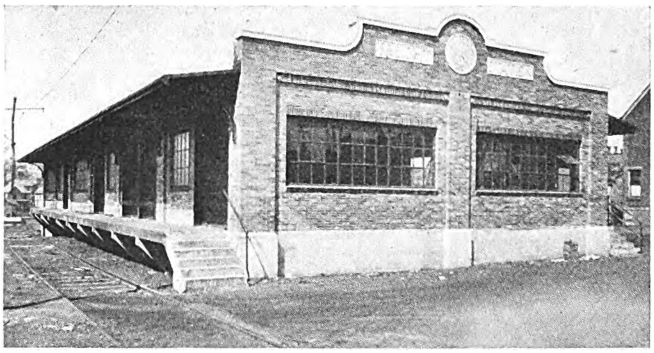
On the outside of the car there are also several new departures from the company's standards in regard to the location of different pieces of equipment. In addition to the headlights having been placed in the center of the dash instead of on the roof, which is standard with the company, the gongs have been installed under the platform floor instead of on the roof, thus freeing this portion of the car of the unsightly guard that was placed around them for protection against damage by the trolley poles. Other distinct departures consist of dash illumination and the reduction in the height of the window guards. One car is equipped with the round rod type, the others with fine mesh type of guard. To complete rehabilitation the cars were renumbered.

Terminal Improvements on West Penn System

ON APRIL 26 the West Penn System opened its new terminal and office building, freight station and garage, built at a cost of $400,000, in Greensburg, Pa. This terminal and office building combines dignity of design and utility. It is a two-story-and-basement structure extending 50 ft. on Main Street and 125 ft. paralleling Fourth Street. Glazed terra cotta columns grace the Main Street side and the front of the building, and they, with the extending canopy marquee on the south, the platform roof and the contrasting terra cotta face brick, make the building attractive in appearance.

Terminal and office building of the West Penn System recently opened at Greensburg, Pa.

The first floor of the terminal building contains the public waiting room. News-stands, telephone booths, checking cabinets and comfortable seats, with an excellent lighting system, make this room one offering real public service. At the south end of the first floor a large and attractive room is provided for the display and sale of electrical appliances for household use. Offices for local executives, the cashiers, train dispatchers and ticket agents are also on this floor.



A freight station and garage was also placed in service in Greensburg by the West Penn System

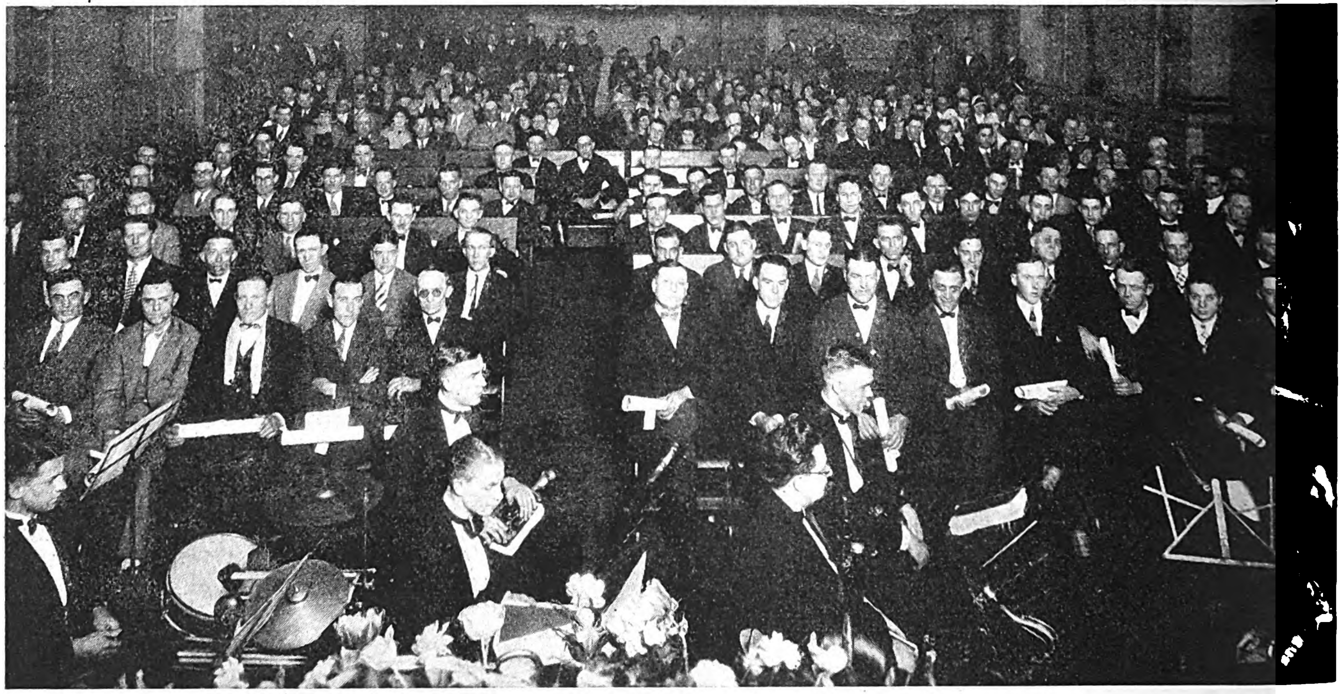
On the second floor a well-equipped room for the railway trainmen is located. Here also are the offices of the division auditor, the division manager and his assistant, the division engineer and the superintendent of construction. The interiors on both floors are finished in glazed brick wainscoting with white upper walls and ceilings. In the finished basement provision is made for storage rooms, the repair shop of the appliance department and the boiler rooms.

A freight station building has been in use for some time. It houses the storeroom for the Greensburg division and the garage.

The opening of this new terminal marks the completion of a series of major improvements made by the West Penn System in Greensburg at a total cost of upward of $400,000.

N. O. P. & L. Bus School Completes First Year

WHEN graduation exercises of the bus school of the Northern Ohio Power & Light Company were held recently at Akron, diplomas were awarded to approximately 200 operators. Although this school was first established a year ago, it did not get in full swing until some eight months ago, when a permanent school room was opened at the Kenmore carhouse. All bus operators have been required to attend one session of school each week. Sessions have been held daily at 10 a.m. and 4 p.m. except Saturday and Sunday. Each department is assigned a 30-minute period.



View of the graduating class of the N. O. P. & L. bus operators' school looking from the Elks auditorium stage toward the audience

The following subjects have been taught:

TRANSPORTATION DEPARTMENT

Company Organization—Operating rules, schedules, fare collections, reports, co-operation.

Bus Operation—Cleanliness of bus, personal appearance, heat and ventilation, personal conduct, accident and ejectment reports, care of injured and sick, care of persons asphyxiated. Prone-pressure method.

Public Relations—Courtesy, selling of service, information to the public, publicity.

General—Bulletins and special instructions, traffic rules and laws, handling of electric wires, selling company's securities, open discussion of all lessons.

MECHANICAL DEPARTMENT

Engine Troubles—General outline, motors, oiling, cooling system, carbon, ignition, gas and vacuum, review.

Chassis — Clutch, transmission, differential, propeller shaft, brake system, foot, shaft and rear axle, brake system level, brake system vacuum, front axle and steering gears.

Accessories — Tires, wheels and fenders, body, lighting, buzzers and horn, battery and starter, starting quick, stopping quick, open discussion at all lessons.

ACCIDENT PREVENTION DEPARTMENT

Accidents and Reports—The accident prevention department, what to do when accidents occur, when to make out accident reports, how to make out accident reports, why reports are required of all unusual occurrences on or near the bus, how to secure witnesses, their value, why they should be obtained, the effect of accidents on the company and the public.

Operation—Rough operation, speed, boulevard stops and right-of-way, safe operation at railway crossings, schedules and how to make them safely, buses colliding with other vehicles, bus collisions, bus and car collisions, making proper stops, review of past lessons.

General—Visiting while on duty, scuffling, playing jokes and results, individual accident records, the value of the accident record, fealty to the company, general review of the past 22 lessons, open discussion at all lessons.

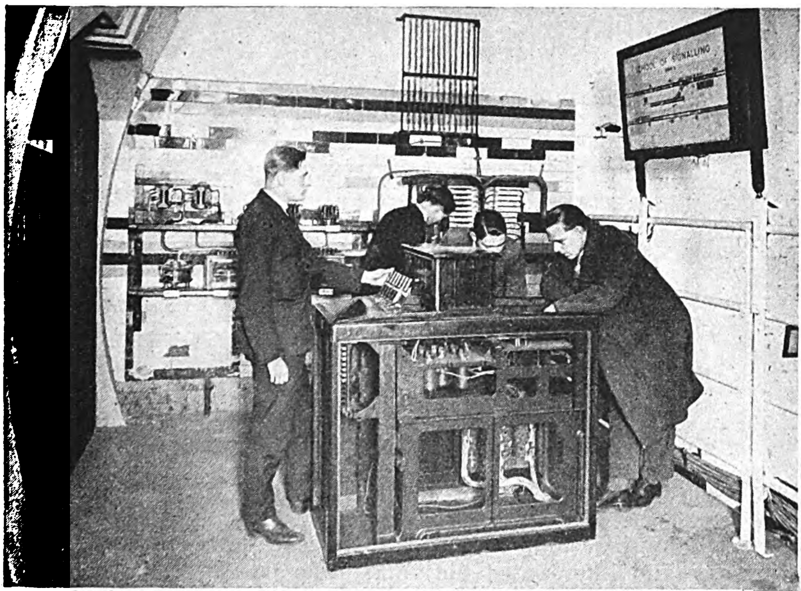
The school is in charge of J. K. Petty, who was taken from the ranks of the bus operators. The entire course has been given in a series of lectures and questions, a final examination being required for graduation. Practical demonstrations and work were given in connection with the lectures, the school room being fitted for that purpose.

Graduation exercises were held in the Elks Club auditorium, Akron, on April 20, at 10 o'clock in the morning and 8 o'clock in the evening—night operators receiving their diplomas in the forenoon and day operators receiving theirs in the evening. The exercises were attended by city officials, and Mayor D. C. Rybolt delivered the principal address in the morning and L. D. Carter, safety director of Akron, made the evening address. Diplomas were presented by A. C. Blinn, vice-president and general manager of the company. Wendell L. Willkie, of company chief counsel, presided. Music was supplied by the company orchestra.

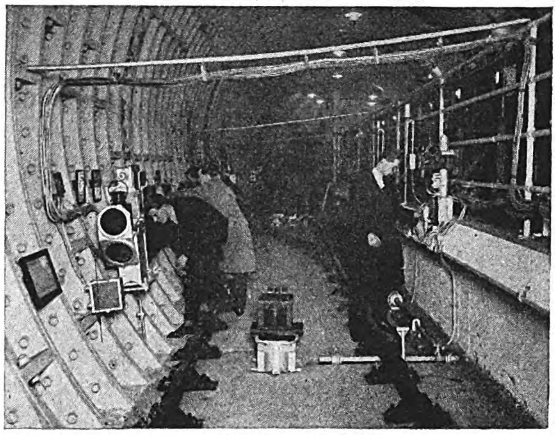
The company is planning the establishment of a school in Canton for the operators on the Southern division of the system.

A Signal School in a Tunnel

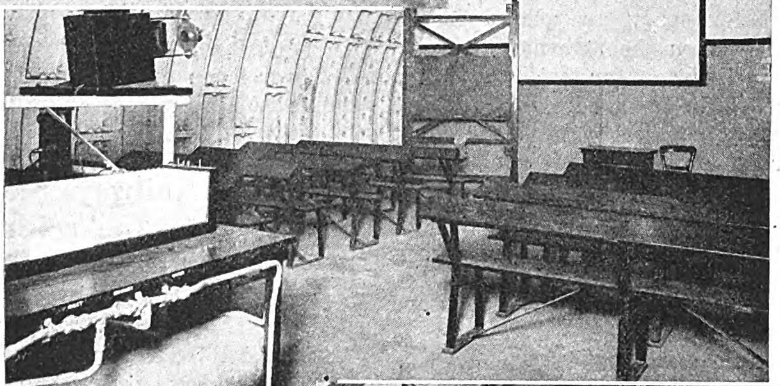
Classes for employees are held by London Underground Companies in unused section of South Kensington tube twice a week—Models of many kinds of signal apparatus are available for study



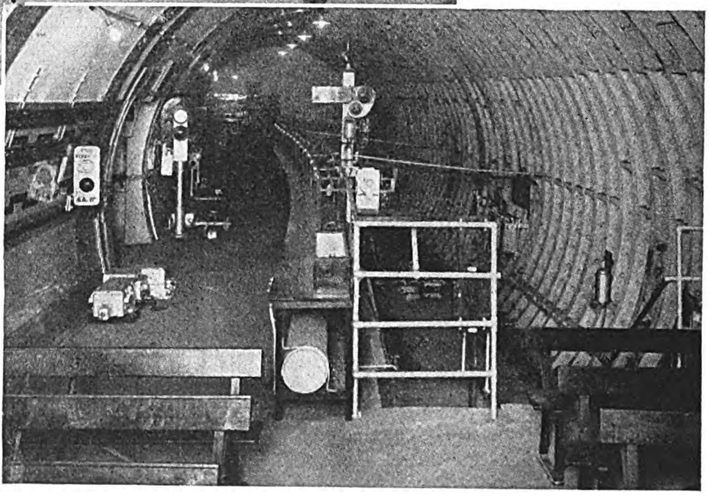
Above, signal interlocking frame with the casing removed



Above, electro-pneumatic tunnel signal



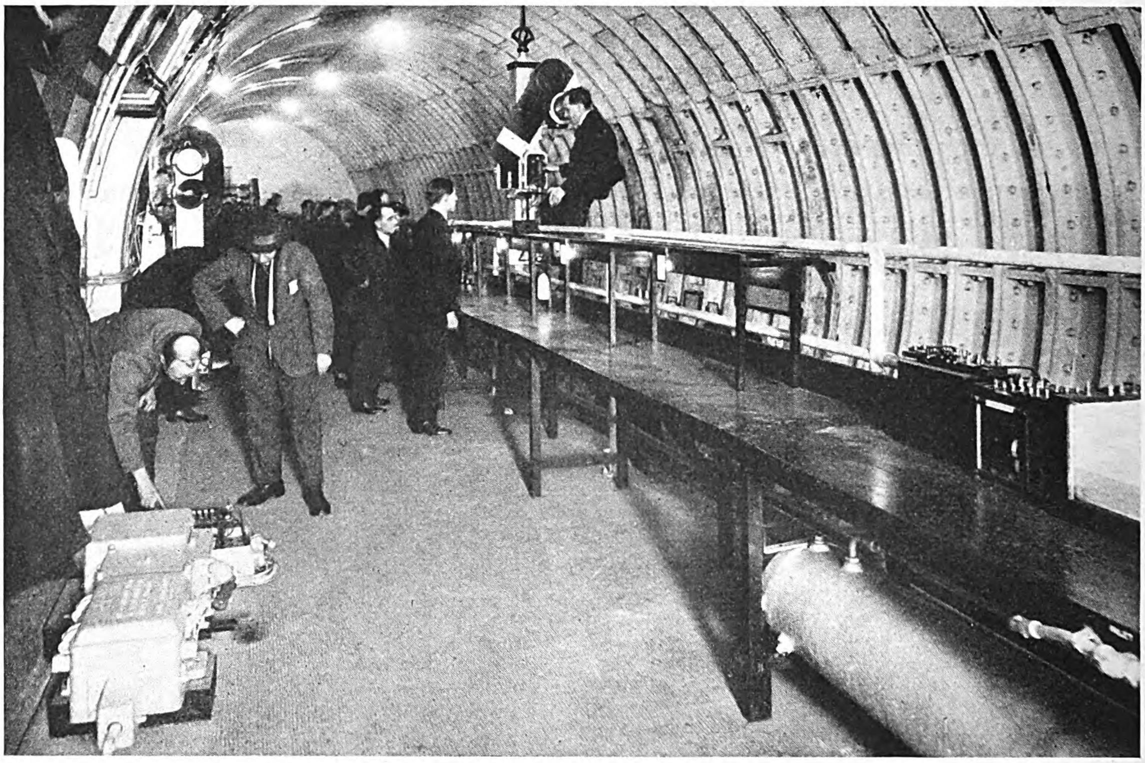
At right, the classroom of the London Underground signal school is provided with a projector and screen. Seats and desks accommodate 60 students



Below, experimental track circuit tank and fog repeater

OPPORTUNITIES for practical and technical training of signal linemen, fitters and installers are provided in a new school recently established by the London Underground Companies. Appropriately enough, the school is located in an unused section of the underground system at South Kensington. It is open to apprentices and signal linemen and to other employees who are interested in the work of the signal section and wish to prepare themselves for examination for better jobs. The method of training is to give a lecture in the school and to follow this by examination and experiment with the apparatus. The lecture room has a capacity of about 60 students. It is fitted with desks, blackboard, lantern and screen. Operation of the apparatus is explained and demonstrated by a qualified technical staff.

Monday evenings are devoted to exposition for apprentices of general principles, rules of signaling and operating practice. On Friday evenings the work is more advanced and covers all signaling, including the most recent a.c. installations. This is for the benefit of linemen and others who wish to keep in touch with the latest practice. At the end of each session an exam-

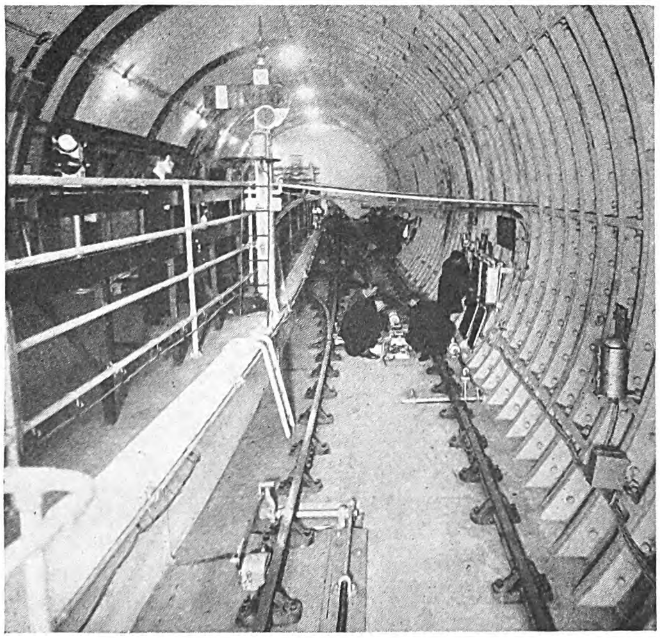


Daylight signal and semaphore

ination is held embracing both technical and practical work. The school is used also for the examination of individual linemen before they are placed in actual charge of signal sections on the railways.

An experimental track circuit for testing and demonstration purposes has been installed. By lowering or raising the water level in a nearby tank the effect of wet or dry weather on a track circuit can be demonstrated. On a bench running the length of the room is a miniature track. In front of the bench are arranged signals and train stops which are controlled from this track.

One end of the room is fitted up to represent a signal cabin complete with seven-lever power frame and illuminated diagram. The power frame controls five signals and one switch. A length of full-sized section of permanent way runs along the school on the lower level. In conjunction with this, signals and apparatus are connected up in the same manner as on the railways.



Switch mechanism and train stop showing circuit breaker box

Detroit Railways Show Enviable Decrease in Accident Figures

GROWING out of a campaign in the interest of safety, the Department of Street Railways, City of Detroit, Mich., reports an appreciable decrease in accidents for December, 1926. Analysis of the figures shows 36.5 accidents per 100,000 car-miles as compared with 39.1 for the same month in 1925, when the campaign was commenced by D. A. Smith, then general superintendent, and now general manager. According to another operating official of the company, other encouraging results are shown in the sphere of controllable accidents, the 1926 figures revealing only 15.9 accidents per 100,000 car-miles as against 23.9 for the previous year. The official last mentioned said:

"At the close of each month the operating division which has the smallest number of accidents is presented with a banner which is displayed in the carhouse. Each division is divided into teams of approximately fifteen men each and the members of the team which has the lowest accident record in the division are invited to a smoker given by the department. The competition for the division banners has become very keen and we anticipate even better results during the present year."

You Profit—
Others Gain from Your Experience!

See the Maintenance Competition announcement, page 1006.

Maintenance Notes

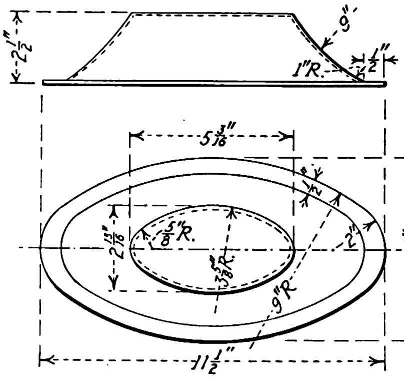
Economic Method of Salvaging Seat Pedestals

By A. M. Lindsay
Superintendent of Rolling Stock
Montreal Tramways, Montreal, Canada

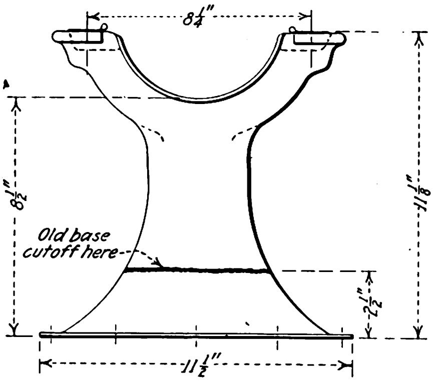
Bases of pressed steel car seat pedestals are subject to severe corrosion as they are in constant contact with the wet or moist floor of the car. The destructive action is more severe in some climates than others. The corrosion can be reduced materially and deterioration can be prevented by treating the bases when they are installed with one of the many adhesive asphaltic compounds on the market.

Finding that the deterioration of seat pedestals made it necessary to replace a large number of these on cars in service, a method of salvaging the old pedestals was worked out by the Montreal Tramways. This has proved satisfactory and economical. The various steps of the method are shown pictorially in the accompanying illustration. The method consists of cutting off the lower section of the pedestal which has deteriorated and replacing this with a new pressed steel section welded in place.

The first operation consisted of cutting off the defective pedestal with an acetylene torch on a line a little less than 2½ in. above the base. The upper portion of the pedestal is then placed in a jig and is milled accurately so that the cut will come exactly 2½ in. above the base line. The new seat pedestal base, made of a mild steel pressing which corresponds closely to the base portion removed, is drilled for the holding down screws and then is spot welded to the old pedestal top at four points. The assembled pedestal is then revolved between centers, as shown in Fig. 3, and the two parts are welded completely at the junction line by an acetylene torch. The joint is then dressed up on an emery wheel and then, after being heated, the base is dipped in melted No. 1 Reeferite compound. After painting the pedestal is ready to be returned to service.



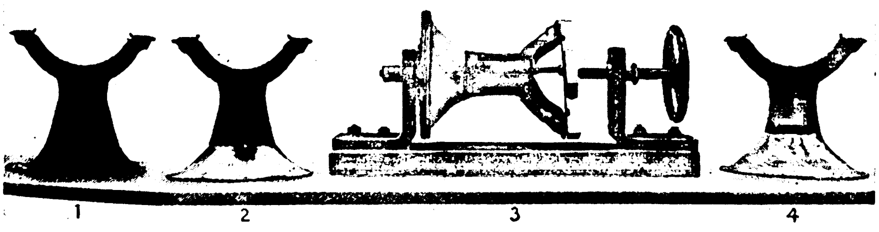
Seat pedestal base which is welded on



Detail of seat pedestal as reclaimed

The total cost of salvaging seat pedestals by this method is 84½ cents and is divided as follows:

	Cents
New pressed steel base	50
Drilling new base	1½
Cutting off old base	7
Milling pedestal	5
Welding and trimming	20
Dipping	1
Total	84½



Method of salvaging seat pedestals

The bottom of the pedestal is first cut off with the acetylene torch as shown in the illustration to the left and the new base is then spot welded into position as shown in the second illustration. By revolving the assembled pedestal between centers, as shown in Fig. 3, the entire junction seam is welded and the completed job, as shown in Fig. 4, is dressed up on an emery wheel.

Resistance Welder Used for Bonding Load

By J. E. Albert
Assistant to General Manager Charleston
Interurban Railroad, Charleston, W. Va.

Erratic loads in bond testing have been overcome by a method developed by the Charleston Interurban Railroad, Charleston, W. Va. The difficulty we experienced with the ordinary bond-testing equipment was that power usually was fed from two directions on the line. With cars pulling current from both sides of the bond tester a very erratic load condition on the tester resulted. The current would not be constant for any length of time and as a result bond testing was a hit or miss proposition and results were very unreliable.

To eliminate the unstable condition testing is now being done after 1 a.m., when no cars are operating. The power supply is shut off at one end of the line so that we are assured of power from one direction only. A constant load of a little over 100 amp. for the bond tester is drawn through the resistance units of an Indianapolis welder hooked up on a line car. Two men precede the car with a Roller-Smith bond tester and each joint is tested as rapidly as the tester can be read.

The accuracy obtained is remarkable. The reading indicates whether the bond is entirely bad or what proportion its resistance bears to that of a perfect bond. With a little experience the man reading the bond tester has been able to guess accurately the proportion of broken strands in the bond. This testing apparatus has been made a permanent part of our equipment and periodical inspections are now being made at night.

Protection for Commutator V-Bands

By John S. Dean

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

SATISFACTORY results are reported by a large railway from the application of dextrine and plaster of Paris mixed with shellac as a protection for the front V-bands of commutators. In mixing the compound shellac is poured into the powdered dextrine and plaster of Paris and is stirred thoroughly until a fairly heavy paint-like mixture is obtained that will just drop off of the mixing stick. If the mixture is too thick it will crack off when dry.

If the mica V-ring is in good condition the string or tape band can be left off. All short circuits should be removed carefully and the V-ring cleaned. The adjacent ends of the commutator bars should also be cleaned. It is particularly important to remove all dirt and oil at the points where the commutator bars join the mica V-ring. This cleaning can be done readily with a small wire brush.

After the cleaning, a coat of shellac should be spread over the V-ring and onto the adjacent ends of the commutator bars. Then one coat of the mixed dextrine and plaster of Paris compound should be put on with a small brush over the surface of the V-ring and the adjacent end of the commutator bars so as thoroughly to fill up all cracks and joints. After the compound has dried thoroughly in the air, not less than three coats of a good air drying insulating varnish should be used for a final finish.

Try this "B-Battery" in your railway motor hook-up, Bang-up Bearings By Better Babbitting.

That Stunt You Did *May Win*

HAVE you stopped to consider that the very job you were doing this morning may have prize-winning possibilities? Many of the things which appear commonplace, and are standard practice with your company, may be unknown to other electric railway maintenance men. It is the personal experience which you have gained in handling maintenance problems on your road that enrich the literature on this subject, and help other maintenance men to do the job better.

Progressive men always keep their eyes open and their minds alert for new ideas. They look ahead and improve their practice by availing themselves of the experience of others. They wish to know what is going on not only in their own field of work, but in the industry as a whole. These are the men who soon become leaders in improved maintenance. With this thought in mind, ELECTRIC RAILWAY JOURNAL is endeavoring to secure more information on desirable maintenance practices, and broadcast the best maintenance kinks through its new Maintenance Data Sheet section.

To help arouse interest several prizes will be awarded. Three capital prizes, the first of $200, the second, $100, and the third, $50, will be given to articles received before Aug. 1. In addition, a prize of $25 is to be given each month. This monthly prize is for the best maintenance idea published in the Maintenance Data Sheet section of the issue devoted to construction and maintenance, which is the third issue each month.

The next issue in which short articles contributed in the maintenance contest will be published is the June 18 issue. The time is getting short for you to get material into this particular issue, and the longer you wait the less chance you have of winning one of the monthly prizes in addition to a capital prize.

Three Capital Prizes

First **$200**
Second **$100**
Third .... **$ 50**

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month, beginning with the May 21, 1927, issue. Articles submitted will be published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

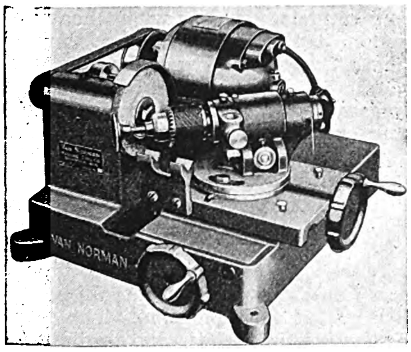
The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

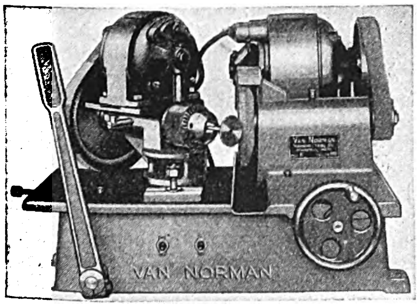
New Equipment Available

Valve Refacers for Bus Maintenance

VALVE refacers of two new types have been designed and are being manufactured by the Van Normal Machine Tool Company, Springfield, Mass. These machines are distributed by the Van Dorn Electric Tool Company, Cleveland, Ohio.



Type D motor-driven valve refacer for small service stations



Type E motor-driven valve refacer with double motor design and floating motor drive

The type D motor-driven valve refacer was designed to meet the need in smaller service stations and garages. It will grind all valves of ¼ in. to 7/16 in. stem diameter and valves having a head diameter of 4½ in. The machine has a universal workhead, graduated for settings at 30, 40, 45 and 50 deg. The workhead and the wheelhead are driven by a single flat belt through flexible shaft, worm and worm gear. A ¼-hp. Westinghouse motor supplies the necessary driving power.

The type E valve refacer is particularly good for heavy-duty work. It may be used for grinding valves up to ⅝ in. in stem diameter and 4½ in. head diameter. Valve reseating cutters and valve seat hones can be reground to the same angle as the ground valve. It is also applicable to grinding valve lifters, tappets, tappet screws, small spindle bolts and the like. The workhead can be turned to a 90-deg. angle with a slide range long enough to grind work having a maximum diameter of 2⅜ in. at the grinding point on the front face of grinding wheel. A 5-in. saucer wheel assists side wheel grinding.

The outstanding construction feature of this type E valve refacer is that it is driven by two motors, which make it possible to operate the wheelhead and workhead independently. These motors are of the high-torque, constant-speed type, insuring even grinding, and are of Westinghouse manufacture. A floating motor drive is another feature of this machine. In order to reduce vibration and thus produce better grinding the motor for driving the wheelhead is mounted slightly back of the center on a pivoted table, producing a spring tension against the pull of the belt. The V block and other standard features are included in the design of this type E refacer.

If you hesitate, procrastinate or miscalculate when you should lubricate, your bearings may have a terrible fate.

High-Low Water Alarm

A NEW signal panel has been designed by the General Electric Company for use as a warning signal to call an attendant in case of danger from overflow or emptying of a water tank. The panel is governed by one or two float switches.

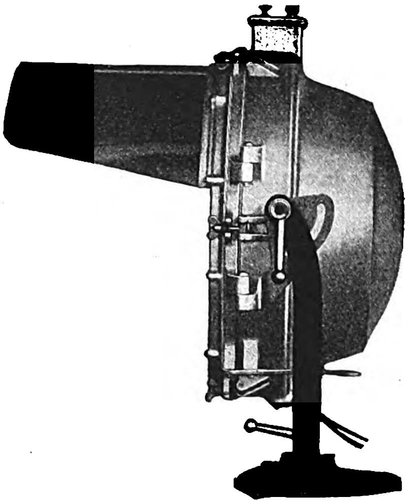
With this panel an audible signal sounds immediately when either the predetermined high or low level of water is reached. The gong can be silenced by the attendant upon his arrival, and the silencing switch does not have to be reset manually after the float switch takes a normal position. "High" and "low" signal lamps are provided, either of which lights when the predetermined level has been reached, remaining lit until the float takes a normal position.

The panel can be used for a one-level signal by omitting the float switch for the other level. It can also be used on pressure systems, but when single-pole float or pressure switches are used it is necessary to add a relay in place of the other pole.

Wide Angle Floodlight Projector

FOR use where long throw and high beam candle-power are essential a new 24-in. floodlight projector, known as type SCA-24, has been developed by the Westinghouse Electric & Manufacturing Company, particularly for railroad yard lighting and similar applications. The large diameter of the reflector in the new floodlight makes possible a wide angle of light with high over-all efficiency. Its long focal distance gives good beam concentration for long-range work, such as is particularly desirable in yard lighting.

The 24-in. parabolic chromium plated brass reflector is mounted in a cast aluminum alloy frame with a spun sheet aluminum back. The lens, of heat-resisting glass, is held in a door which opens from the front, swinging sideways. Thus it is possible to renew lamps and clean the reflector without interference from the door.



Side of floodlight projector

The floodlight is mounted so that it can be tilted upward where its position is such that approach from the front is not practical. A stop is provided so that it is unnecessary to aim the projector each time it is moved from position. Focal adjustment is provided by three screws, which operate independently, two for "in" and "out" and lateral motion of the lamp, and one for adjustment of focal distance from the reflector.

The reflector is entirely inclosed, no ventilation being required. It is furnished for either narrow or wide beam and with either a plain or spread lens. The visor is supplied as an accessory.

Association News & Discussions

Economics of Railroad Electrification*

By Sidney Withington

Electrical Engineer New York, New Haven & Hartford Railroad,
New Haven, Conn.

INSTALLATION of facilities for electric traction usually involves large amounts of additional capital, and it is obvious that unless the return from the electric operation—either direct or indirect—more than offsets the added fixed charges, including interests, depreciation, taxes, etc., the project cannot be justified.

The major advantage of electrification may be said in general to be fuel economy, either through the application of hydro-electric power, where such power is available, or through the use of steam power plants, where power can be economically generated. The steam locomotive has been improved recently by increasing steam pressures and by the application of such devices as mechanical stokers, feed water heaters, superheaters, limited cut-off, "boosters," etc., to a point where its efficiency in some cases may be as high as 8 per cent. This apparent efficiency, however, is reduced when losses incurred in "firing up," waiting at terminals and stations, operating at unfavorable loads, or coasting are considered. Poor handling on a run (where supervision is often difficult) may be a cause of decreased efficiency and wasted fuel. Fuel burned in a power plant is, by and large, burned under conditions favorable to economy. Individual machines exhausting at high vacuum can usually be operated at favorable loads. There is opportunity for good heat balance as a rule, and often an inferior quality of fuel may be utilized. Power plant operation at efficiencies of 20 per cent is not unusual. The power, of course, must be delivered from the power plant to the locomotives and thence converted into mechanical energy at the drawbar, and comparisons should be made on this basis, but even considering these losses, the overall fuel consumption under electric operation, other things being equal, is undoubtedly well under one-half that under steam operation.

The development of the Diesel electric locomotive may change the entire problem of economical railroad operation. The Diesel engine is of very high thermal efficiency and is in many ways a promising form of motive power. It is, however, now in its early stages of development, and is as yet available only in relatively small units. Not enough is known of its performance under operating conditions to determine how far its development will continue.

Another economy of electric operation is the maintenance of electric locomotives as compared to steam. This is especially true in the "engine house" expenses. The care of the electric locomotive at engine terminals is extremely simple compared to the attention which it is necessary to give to steam locomotives, which must undergo cleaning of fires, dumping of ashes, boiler washing, coaling, watering, and must be turned around at the end of each trip.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 6-8—**American Association of Engineers, annual convention, Tulsa, Okla.**

June 9-11—**Midwest Electric Railway Association, annual meeting, Hotel Chase, St. Louis, Mo.**

June 13-16—**National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

June 15-16—**American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24 — **American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 29-July 1 — **Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1 — **Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

There are numerous other advantages which may accrue on account of electrification in individual instances. One of these is abatement of smoke and noise. This is, of course, especially true in urban districts, but the advantages are difficult to evaluate, and it is easy to give them undue importance. The smoke from locomotives is usually but a small part of the smoke in the atmosphere of large cities. There is, however, sometimes a controlling motive in the elimination of smoke from long tunnels, not only where heavy passenger traffic is concerned, but also where freight is largely handled. The elimination of smoke automatically increases the capacity of tracks through long tunnels which often constitute limitations or "bottlenecks" in railroad operation.

Relief of Congestion May Justify Electrification

Track or terminal congestion has sometimes provided a controlling justification for electrification. The electric locomotive is practically unlimited in capacity, for additional units may be added almost indefinitely as required, all controlled by one crew. The capacity of the steam locomotive is controlled by track clearance and weight limitations and consequent mechanical considerations. Adding units of steam locomotives is not economical, as each added locomotive requires its own crew.

Congestion in terminals has in some special instances been relieved by electric operation, and in Philadelphia the necessity for general rearrangement of facilities was postponed by electrifying the suburban service. Electric traction made possible the operation on two levels of the passenger yard at the Grand Central Terminal at New York, and the utilization of the territory over the tracks for revenue-producing buildings.

Electrified suburban operation provides a solution for a number of problems. With motors installed on the cars themselves, operated as multiple unit equipment, rapid acceleration is possible, which in turn means faster schedules, especially where stops are frequent. Switching problems are, to some extent, simplified. Suburban electrification, however, means duplication of engine facilities at the end of the suburban territory, and this involves heavy expense which it may be difficult to justify.

Electrification has been of great value in mountainous country in making regeneration of power possible on long, descending grades. The absorption of the energy of a heavy train going down hill, by feeding it back into the power system where it can be usefully employed, is far more desirable than using such energy up in heating brakeshoes and wearing out car wheels.

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*Abstract of a paper presented before the Affiliated Technical Societies of Boston, Feb. 17, 1927.

To balance the numerous advantages of electrification, there is first to be considered the very high initial cost of the new facilities which are required. These facilities may be roughly divided into three main parts: first, the power plant; second, the power distribution system to convey the power to the locomotive; and third, the locomotives themselves. The railroad must pay interest and taxes on each dollar of the investment which is required, and must also lay aside money for replacement when it becomes necessary through wear and tear or through obsolescence. These fixed charges constitute the first and perhaps the largest expense in connection with any electrification project.

INVESTMENT EXPENSE OF ELECTRIFICATION IS HEAVY

A railroad which is electrifying may find it desirable to purchase power instead of producing it in a plant of its own. If this is the case, the annual charges are still borne by the railroad, but are in the form of payments to the power company for the required power plant capacity to take care of interest and depreciation (or "replacement reserve") as figured by the power company.

The railroad must itself supply the funds for the construction of the power distribution system along the right of way. This is a large item and the annual charges are thus correspondingly heavy. The cost of maintaining the distribution system is one of the largest single items of expense of electric operation. This cost is not only direct, in the form of actual material and labor required, but also indirect, in the form of interference with operation while maintenance work is being performed.

The cost of the electric locomotives themselves is relatively high compared with steam locomotives of equivalent characteristics. This additional cost may in some instances be balanced by increased mileage, for the electric locomotive is available for service many more hours per year than the steam locomotive, but the demands of traffic, especially the so-called "fleet movement" of suburban service toward the city in the morning and from the city at night, often limits the mileage which can be made by the equipment, so it is usually the case that the electric motive power costs considerably more than the steam locomotives which are thereby displaced.

ELECTRIFICATION PROJECTS INAUGURATED FOR VARIOUS REASONS

Each railroad which has up to this time exchanged steam for electric operation has done so for some specific reason; that is, the solution of some local problem; and in few, if any, instances have general economic considerations solely governed. In each instance the electrification has well performed the requirements.

About a dozen steam railroad electrification projects, inaugurated for one reason or another, are in operation over more or less extensive territories, in addition to a number of electrically operated tunnels. The Chicago, Milwaukee & St. Paul, the Butte, Anaconda & Pacific and the Great Northern operate in mountainous country in the Northwest where fuel is extremely expensive and hydro-electric power exceptionally plentiful. Fuel saving and regeneration of power on long down grades were therefore controlling justifications, in spite of the fact that traffic density is relatively light. The Great Northern had also to consider operation through the long Cascade Tunnel.

The New York Central and Long Island Railroads operate heavy suburban passenger service electrically in the vicinity of New York. These projects were originally made necessary by tunnel operation. The Baltimore & Ohio at New York, the Pennsylvania at Philadelphia, the West Jersey & Seashore at Camden, and the Illinois Central at Chicago, each operates electrically heavy passenger suburban service. These electrifications were inaugurated on account of density of traffic on main line tracks, with few branch lines to complicate the installation and add to expenses of operation.

The Virginian and Norfolk & Western Railroads operate extremely heavy coal trains over tracks the capacity of which had been reached under steam operation. Trains up to 9,000 tons each are now handled by electric locomotives over heavy grades. The locomotives regenerate power going down hill, thus conserving energy and reducing wear and tear on brakeshoes and wheels.

ALL CLASSES OF SERVICE OPERATED ELECTRICALLY ON NEW HAVEN

The New York, New Haven & Hartford Railroad operates electrically between New York and New Haven local suburban service, through passenger service, freight service, and yard switching, and, through its subsidiary, the New York, Westchester & Boston, operates interurban service between New York and New Rochelle and White Plains. The New Haven is the only railroad in this country which thus operates on one system all branches of service electrically. The traffic is extremely dense, and the fact that it is so largely confined to one main line with few branches makes it ideal from the point of view of economical electric operation.

In addition to these examples of electric operation, a number of steam railroads are operating tunnels by electric power, utilizing electric locomotives to haul trains through the tunnels. Among these are the Pennsylvania at New York, the Baltimore & Ohio at Baltimore (this was the second oldest application of electric traction to steam railroads, the Nantasket Beach Branch of the New York, New Haven & Hartford having been the earliest), the Boston & Maine at North Adams (Hoosac Tunnel), the Grand Trunk at St. Clair Tunnel, and the Michigan Central at Detroit River.

ALTERNATING-CURRENT VS. DIRECT-CURRENT SYSTEM

There have been developed in this country two general systems of electrification—the alternating-current, or single-phase system, and the direct-current system. The single-phase system usually employs 11,000 volts in the trolley over the tracks at 25 cycles per second. The direct-current systems employ voltages which vary from 600 to 3,000. The lower voltages are distributed by third rail, while distribution above 1,200 volts is usually by means of overhead trolley. The chief exponents of the direct-current system at present are the Long Island, the West Jersey & Seashore, the New York Central, and the Baltimore & Ohio, all with third rail; and the Illinois Central, the Butte, Anaconda & Pacific, and the Chicago, Milwaukee & St. Paul, with overhead trolley. The principal single-phase systems are the Norfolk & Western, the Virginian, the Great Northern, the Pennsylvania, and the New York, New Haven & Hartford Railroad.

Each system has some advantages over the other, and each has its advocates, who enthusiastically support their opinions with loud voices. There is not yet sufficient information available to convince every one as to the undoubted superiority of one system or the other when all classes of service are considered, and thus to permit standardization throughout the entire country.

Public Utilities Advertising Association Will Stage Utility Copy Exhibit

AN EXHIBIT of public utility advertising is being arranged by the Public Utilities Advertising Association in connection with their meetings at the 23d annual convention of the International Advertising Association to be held June 27 and 28 at the Albany Hotel, Denver, Col. It is to be the only exhibit at the convention. Series after series of institutional advertising, a newly developed Washington dash sign and an extraordinary quantity of direct mail matter have been received and are to be included in the display. More than 7,000 proofs of utility advertising published in the past year have already been sent to Denver. Arrangements have been made with the Public Service Company of Colorado to set up a special exhibit in the windows of its Denver offices.

Frank LeRoy Blanchard, president Public Utilities Advertising Association, director of advertising and news Henry L. Doherty & Company, New York, N. Y., will preside.

The program is outlined below. The meetings will be held in the Magnolia Room:

Monday Afternoon, June 27, 2 P.M.

2:00. President's Address, Frank LeRoy Blanchard.

2:30. "Why National Utility Associations Believe in Advertising," by Paul S. Clapp, executive director National Electric Light Association, New York, N. Y.

Questions and Discussion.

3:00. "How to Buy Radio Time and What to Do with It," by Henry Obermeyer, assistant to vice-president Consolidated Gas Company, New York, N. Y.

Questions and Discussion.

3:45. "Why Newspapers?" by J. C. McQuiston, advertising manager Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Questions and Discussion.—Other Media.

4:30. Report of Public Utilities Advertising Association Committee on Costs and Results, by its chairman, A. C. Watt, of

Hodenpyl, Hardy & Company, New York, N. Y.

5:00. Questions and discussion on addresses and papers of the afternoon session.

Tuesday Afternoon, June 28, 2 P.M.

Presiding: H. M. Lytle, vice-president Public Utilities Advertising Association, and vice-president Chicago Rapid Transit Company, Chicago, Ill.

2:00. "The Future of Organized Advertising," by W. Frank McClure, chairman Advertising Commission and vice-president Albert Frank & Company, Chicago, Ill.

2:30. "Percolators vs. Paris Hats—Advertising Appliances the Department Store Way," by Miss Dorothy Dignam, McJunkin Advertising Company, Chicago, and copywriter for Commonwealth Edison Electric Shops, Chicago, Ill.

Questions and Discussion.

3:15. "Advertising—And Informing the Public," by Labert St. Clair, director of advertising American Electric Railway Association, New York, N. Y.

Questions and Discussion.

4:00. "Where Does the Agency Fit In?" by James O'Shaughnessy, executive secretary, American Association of Advertising Agencies, New York, N. Y.

Questions and Discussion.

4:45. Report of Public Utilities Advertising Association Committee on Better Copy, by its chairman, Irving M. Tuteur, McJunkin Advertising Company, Chicago, Ill.

5:00. Questions and discussion on the addresses and papers of the afternoon session.

Plenty of Entertainment at C.E.R.A. Meeting

NUMEROUS entertainment features have been arranged by the program committee of the Central Electric Railway Association for the summer meeting, June 29 to July 1, as well as three business sessions. The latter will be conducted on Wednesday, Thursday and Friday mornings beginning sharply at 9:30 o'clock. Announcement of the subjects will be published in the form of a program and mailed to each member in about two or three weeks.

Afternoons and evenings during the meeting have been wholly set aside for the entertainment of the members, their families and such guests as they may wish to invite. On Wednesday afternoon there will be a tour through the Ford Motor Company plant. Wednesday evening an informal dinner and program of entertainment will be held at 6:45 o'clock followed by dancing in the Italian Room of the Book-Cadillac. On Thursday afternoon at 1:30 o'clock there will be an excursion to Bob-Lo Island, 18 miles south of Detroit, where there will be games and contests for the children and a golf tournament, dancing and other entertainment for the members. Ladies and children attending the convention may leave Detroit as early as 9:30 o'clock in the forenoon if they wish to spend the whole day at the resort. Entertainment on Thursday evening will be informal dancing in the Italian Room of the Book-Cadillac.

C.E.R.A. Traffic Association Meets

THE Central Electric Traffic Association held its convention at the Tuller Hotel, Detroit, Mich., on May 18 and 19. Reports of the standing and special committees were presented. Members present were: O. H. LaZelle, C. W. Randolph, H. G. Mason, C. D. Hardin, W. S. Rodger, N. Rumney, R. B. McEachran, R. Thompson, F. L. Ackerman, C. O. Sullivan, C. J. Laney, J. A. Greenland, W. S. Whitney, Mr. Herbert, G. W. Quackenbush, C. M. Byrne, F. L. Boyer, J. K. Coberly, R. M. Glick, V. T. Barry, W. L. Snodgrass, F. D. Norveil, W. L. Myers, C. J. Collins, A. E. Wafer, J. H. Crall, L. S. Gay, E. L. Hukill, H. W. Smith, O. A. Small, Mr. Craft, L. A. Goodrich, O. H. Murlin, J. O. Motto, E. Hamprecht.

Committees Named by Wisconsin Utilities Association

JOHN ST. JOHN, recently re-elected president of the Wisconsin Utilities Association, has appointed eleven general committees to carry on the research, educational, technical and accident prevention work for the new fiscal year. The chairmen and their committees follow:

Advisory—George H. Wilmarth, Eau Claire, chairman; L. N. Boisen, Chicago; R. B. Brown, J. P. Pulliam, S. B. Way, Milwaukee; G. C. Neff, John St. John, Madison; D. E. Callender, Racine, and Harold L. Geisse, Wausau.

Information Bureau—J. P. Pulliam, Milwaukee, chairman; John N. Cadby, Madison, secretary; R. B. Brown, S. B. Way, Milwaukee, and G. C. Neff, Madison.

Legislative—B. W. Arnold, Milwaukee, chairman; Harold L. Geisse, Wausau; George H. Wilmarth, Eau Claire; J. P. Pulliam and W. A. Jackson, Milwaukee.

Accident Prevention and Insurance—Ivan L. Scott, Madison, chairman; C. B. Boulet, W. Koehler, Milwaukee; M. R. Frederickson, Wausau; Lucinda Gothe, Ashland; W. H. Mann, Eau Claire, and J. W. Oliver, Waukegan.

History—Walter L. Haight, Racine, chairman; Ralph Drew, Wausau; A. R. Gale, Beloit; L. W. Cobler, Eau Claire, and F. W. Huels, Madison.

Educational—A. J. Goedjen, Menominee, Mich., chairman; F. W. Huels, Robert Quick, Madison; Arthur E. Johnson, Eau Claire, and A. J. Rowland, Milwaukee.

Preservation of Structures—James G. Allen, Lake Geneva, chairman; E. C. Brenner, E. J. Steinberg, Milwaukee; John C. Felton, La Crosse; R. M. Howard, Winona; E. J. Kallevang, Madison, and I. R. McCall, Chicago.

Women's—Mildred Manley, Lake Geneva, chairman; Amanda L. Buscher, Green Bay; Florence Clark, Lillian Minch, Madison; Mrs. Zilla R. McClure, Erna Burzlaff, Milwaukee, and Ruth C. Tarum, Eau Claire.

Co-operation with Educational Institutions—Harold L. Geisse, Wausau, chairman; W. C. Lounsbury, Superior; Lloyd V. Ballard, Beloit; W. C. Butterworth, Platteville; J. W. Dumont, Whitewater; W. A. Exner, Ripon; John G. Felton, La Crosse; Dean E. A. Fitzpatrick, Ewald Hasse, M. C. Potter, Milwaukee; Prof. S. W. Gilman, Geol P. Hambrecht, H. W. Schmidt, Madison, and Omar Loop, Superior.

Public Speaking—M. H. Frank, Fond du Lac, chairman; W. C. Butterworth, Platteville; J. G. Felton, La Crosse; F. A. Coffin, Milwaukee; C. A. Dow, Eau Claire; M. R. Frederickson, Wausau; Walter Haight, Racine; W. J. Hodgkins, Ashland; J. E. Horsman, Rice Lake; C. R. Phenicie, Green Bay; E. F. Rider, Oshkosh; R. C. Walter, Madison, and A. P. Gale, Beloit.

Subjects Announced for Wisconsin Accountants Meeting

ACCOUNTANTS of electric railway, electric and gas companies in Wisconsin will hold their annual convention at the Northland Hotel in Green Bay, June 17 and 18. James H. McGillan, Mayor of Green Bay, will address the convention on "Public Relations Between the Public Utility and the Community." L. E. Gettle, chairman of the Railroad Commission, will talk on "Valuation as Affected by Recent Court Decisions."

Speakers and their subjects at the first morning session will include R. E. Moody, Milwaukee, "Review of N.E.L.A. Accounting Section's Convention"; M. Gass, Milwaukee, "Proper Distribution of Costs in Automobiles, Trucks and Transportation Equipment." At the first afternoon session C. B. Boulet, Milwaukee, will talk on "The Accountant's Place in the Safety Program"; H. P. Taylor, Green Bay, "Employees' Education"; Robert J. Johnson, Milwaukee, "Accounting Problems in Connection with Industrial Gas and House Heating Customers."

The second morning session will be opened with a round-table discussion on "Accounting Problems in Connection with Bus Operation." Warren Montgomery, Madison, will lead the debate. J. E. Gray, Madison, will read a paper on "Apportioning Expenses Between Merchandising and Operation." Sam R. Hatch, Milwaukee, has for his subject, "Accounting Treatment of Property Retired." Previous to Mayor McGillan's address the section will elect officers for the new year.

Two other speakers will be added to the program, which will be concluded in the afternoon with an inspection trip through the new Bayside generating station and the offices of the Wisconsin Public Service Corporation.

A dinner and dance will be held at the Door Country Club in Sturgeon Bay the first evening. Convention arrangements are being made by D. W. Faber, A. L. Buscher, H. P. Taylor, L. C. Christiansen, L. P. Ziebell, L. P. Works and G. S. Meyrick of the Wisconsin Public Service Corporation, Green Bay.

American Association News

Service Betterment

FINAL committee reports were assembled at the meeting of the service betterment committee held May 27 at the association headquarters in New York. Notes and sub-committee reports had been developed by the chairman, S. E. Emmons, into a tentative report, and following a discussion on a number of items the report was completed.

Members present were E. A. Palmer, A. E. Potter, A. C. Spurr, J. C. Thirlwall, W. E. Thompson, C. D. Smith, John A. Dewhurst and S. E. Emmons, chairman.

The News of the Industry

Paving Relief Denied in Wheeling

Wheeling, W. Va., voters on May 26 rejected the proposed amendment to the city charter which would permit the Council to grant relief to electric railways from paving obligations by a vote of 9,225 to 7,716. The amendment, if ratified, would have empowered the City Council to determine when and where the railways should pave. The ordinances under which the railways now operate provide they shall pay for all paving between their tracks. The amendment was defeated despite a determined campaign of the Wheeling Traction Company, which advertised liberally in all the newspapers by letters and on the radio. A. C. Spurr, general manager, also made talks before all the civic clubs. The proposal was supported editorially by the newspapers.

New Transfers on Buffalo Local Lines

The International Railway, Buffalo, N. Y., adopted two new types of transfers on its local lines effective May 29. The new transfer system is aimed to speed up service on the one-man cars which now are being operated on almost every local line in the city. Under the system which has been in effect for a number of years operators were required to punch the time and the destination line of passengers.

One type now in use is for passengers who require a single transfer to reach their destination line. No other transfer will be issued when this type of transfer is presented by a passenger. The second type is for passengers who require two or more transfers to reach a destination line. This latter form has an attached stub, which is accepted as fare on the intersecting line, while the body of the transfer is retained by the passenger to be used on the third line. Passengers using this type of transfer are required to give the names of all lines over which they will travel to reach their destination, so that the names of the lines are punched upon the body of the transfer.

The transfers also are subdivided into in-bound and out-bound forms and the date is prominently displayed in boldface type upon the face of the transfer. The company believes these two new forms will eliminate much of the transfer abuse which has been detected in the past. Before the new transfer system went into effect the International Railway used a series of three-column 8-in. advertisements in the daily newspapers to acquaint car riders with the details of the new plan; posters were displayed on the dashboards of all cars and swinging signs telling of the change were placed inside all the local cars.

The first of the series of newspaper advertisements reproduced a typewritten letter signed by President Yungbluth and addressed to the car riders of Buffalo asking them to read the newspaper advertisements which were to follow. Later advertisements reproduced samples of the new transfers with a detailed description of how they were to be used. The company says this newspaper advertising campaign, linked with the car posters and swinging signs, helped riders to adopt the new system wihout any confusion.

Hearings on Chicago Bills Concluded

Amended Traction Bills Begin Course Through State Senate—Score of Amendments Suggested—New Bills Represent Tacit Agreement of City and Companies for Local Transportation Settlement

FINAL public hearings on the five Chicago bills which were introduced in the Legislature at Springfield on May 17 were concluded on May 31 by the joint legislative committee on public utilities and the documents were reported to the state Senate with recommendation that they be passed. The public discussion on the legislation, called for May 31, was cut short after a score or more amendments had been suggested by the local transportation committee of the Chicago City Council and a suggestion that Mayor Thompson of Chicago be invited to discuss the bills had been heard from Judge John M. Harlan, representative of F. J. Lisman & Company, who has vigorously opposed the bills at every turn. Of the various amendments urged, four were ultimately adopted by the committee and attached to the bills as they were sent to the Senate.

Summarized, the provisions in the amendments are as follows:

1. That no terminable permit can be granted and become effective without submission to a referendum.
2. Power of the Governor to appoint all employees, fix salaries and supervise all expenditures of the proposed county transit commission is removed.
3. The city of Chicago is to be relieved of the necessity of assuring the cost of moving public utility properties which would have to be relocated during construction of subway.
4. Any permit or grant to a street railway running for less than a year shall not be held to be a terminable permit.

Revisions recommended by the Chicago Aldermen, some of which were covered by the amendments approved by the committee, included:

1. Placing the expense of relocating public utility wires and conduits, etc., in the construction of subways on the companies instead of on the city as proposed in bill No. 1.
2. Permitting the city to grant either a terminable permit or a fixed term franchise.
3. Granting of power to the city to terminate indeterminate permits when the companies fail to make extensions or render efficient service.
4. Giving the power to the surface lines as well as the elevated lines to acquire other local transportation facilities.
5. Submission of all railroads doing a local or suburban business within the district to the jurisdiction of the proposed transit commission.
6. Appointment of all five members of this commission by the Mayor of Chicago, thus removing the Governor's control over the board.
7. Substitution of the Durso and McCluggage home rule bills for the present bill which proposes to create a county transit commission.
8. Issuance of terminable permits only after a public referendum. In addition to the proposals made by the Aldermen, the legislative committee listened to several prominent Chicago real estate men and bankers who expressed themselves as being highly favorable to the indeterminate permit.

The first and fourth amendments were offered by Senator Richard J. Barr in behalf of attorneys for the transportation companies who originally introduced the bills. Amendment No. 1 supersedes a clause in bill No. 1 which provides that all grants made by the city following the passage of enabling legislation, regardless of duration, shall be indeterminate permits. This feature, it was pointed out by critics of the measure, would make it virtually impossible for the city to extend the present six-month Surface Lines franchises even for a single day, without giving the companies a perpetual grant.

In presenting amendment No. 4, Senator Barr explained that the framers of the bills had deemed it unnecessary to make provision for a public referendum inasmuch as the Governor of the state and the Mayor of Chicago had both previously announced that any plan for the settlement of the local transportation problems must first be submitted to popular vote before becoming an ordinance. Definite provision for a referendum, however, he said, was being inserted in the bill to satisfy members of the local transportation committee and other civic bodies.

Promising a complete and permanent solution of Chicago's complex twenty-year old railway problem, the new bills represent the tacit agreement of both city administration and local transportation companies as to legislative acts necessary to validate plans for a unified transit system. The documents themselves were sponsored and drafted by officials of the surface and elevated lines, but are understood to have met with the general approval of Mayor Thompson and the city administration.

Agreement Reached in Pontiac

Negotiations between the city of Pontiac, Mich., and the Detroit United Railway were concluded recently when the City Commission passed an ordinance, tentatively approved by Master in Chancery Sayres of the federal court.

The ordinance provides that the company lay new tracks on Saginaw and West Huron Streets, take up its third track on Saginaw Street, and pave the strip left open; place ten new double-truck cars in operation; abandon the downtown freight station; and deed to the city a strip of land in the center of West Huron Street, extending from Waldo Street to West Boulevard, the west city limits. It also provides that the present rate of fare be maintained. The city in return permits the company to operate its cars on a day-to-day basis, terminable on 30 days notice.

Despite the fact that franchise on some lines expired two years ago, the company has continued to operate its cars on a day-to-day agreement. In view of the settlement it is expected the hearing on the city's petition in federal court asking the receiver to remove the tracks at the expiration of the franchises will be postponed.

Limitations Suggested for Broadcasting by Railways

The Federal Radio Commission does not look with favor on the granting of broadcasting licenses to electric railways where the principal purpose is to provide entertainment for the passengers on their cars. The feeling of the commission is that this service can be furnished effectively by "wired wireless" without further congesting the air. Serious consideration is being given the installation of loud speakers in the cars of electric railways in several cities.

Jersey Transit Body Urges 41st Street Tunnel Extension

Advantages that come to commuters of New Jersey from the construction of the proposed tunnel between the Times Square section of New York to New Durham, N. J., were demonstrated in a report of the North Jersey Transit Commission, made public on June 1. It is said the tunnel, designed to connect with the Interborough tunnel from Queens County, which now has its terminus at 41st Street and Seventh Avenue, would cost $33,000,000.

In connection with the report of probable traffic it was brought out that the commission has under consideration three methods of financing the undertaking. One is a bond issue similar to the plan used in financing interstate bridges; another is by the assessment plan taking into consideration the fares to be received, and the third is private financing with control exercised by some public body such as the Public Utilities Commission of New Jersey or the Interstate Commerce Commission.

The report shows that at the outset the tunnel would carry about 100,000 one-way passengers daily and that by 1945 this total would be increased more than 50 per cent. The report indicated that a competing tunnel to connect with the B.-M. T in West Fourteenth Street was considered. With suburban trains rerouted engineers found that the daily one-way traffic as of 1926 would be 95,508 and in 1945, 152,800. Considering the competing tunnel emergency the total in 1945 comes to 191,800.

It is estimated that the total traffic the tunnel would receive from the railroads would be about 41,437 passengers daily. In addition it would get 54,071 passengers from the ferries and the Hudson Tubes. The average rate of the fare mentioned in addition to the commutation rate has been figured out and ranges from 3.38 cents to as high as 12.65 cents.

Study of Providence Traffic Proposed

A bill has been passed by the Legislature of Rhode Island to create a board to be known as the Providence Thorofare Board in and for the city of Providence to consist of seven persons. This board is instructed by the act that creates it to familiarize itself thoroughly with the Providence traffic and thoroughfare plan approved by the City Council on Dec. 23, 1926, and with that plan as a basis and guide it is to proceed to prepare proposals for carrying out that project.

Broad powers of condemnation were conferred upon the new body. The act also authorizes the City Council of Providence to cause a special tax upon tangible personal property and real estate in the city. The board is to consist of three residents of the city, not members of the City Council, to be appointed by the Mayor, subject to the approval of the Council.

The legislation really has to do with the alleviation of traffic conditions in the city. By City Council resolution approved on April 11, 1925, a committee of the Council was authorized to make a thorough study and investigation of the traffic needs and requirements and their relation to all phases of the physical development of the city and to report to the City Council a comprehensive traffic and thoroughfare plan for the entire city, designed to meet the probable demands of growth and expansion for a long time.

Subsequently by city resolutions approved on June 5, 1925, the committee was authorized and empowered to secure the services of Robert Whitten, New York City, as consultant to assist the committee in the preparation and presentation of a plan of this kind. Mr. Whitten's plan has been referred to previously in the ELECTRIC RAILWAY JOURNAL, particularly the issue of Oct. 23, 1926, page 782, and the issue for Aug. 7, 1926, page 234.

In this connection it is interesting to note that grateful acknowledgment is made by the city planning consultant to the joint standing committee on ordnances of the City Council with respect to the courtesies extended to him by the United Electric Railways, Providence, in supplying data regarded by him as needful in his study, and for the co-operation of the officers of the company in the work which he undertook.

Through Limited Service for Illinois Valley Cities

Through limited service of eight cars daily between Chicago and La Salle, Ill., and intermediate points was started on May 15 by the Chicago & Joliet Electric Railway and Illinois Traction System upon completion of a short track connection in the city of Joliet. The new route, 90 miles long, penetrates the upper reaches of the beautiful Illinois River Valley and provides a fourth through interurban service out of Chicago.

Under an operating agreement between the two lines the Illinois Traction System now runs express cars over the Chicago & Joliet Electric Railway from the Archer Avenue terminal in Chicago to Joliet, thence over its own tracks to Morris, Ottawa and La Salle. The running time of the limited cars is approximately five hours.

Five light-weight, single-end, one-man cars have been remodeled for this service by the Illinois Traction System.

$13,000,000 for Less than a Mile of New York Subway

The city of New York has decided to construct the Nassau Street subway, which has been a point of contention between successive city administrations and the Brooklyn-Manhattan Transit Corporation and its predecessor, the Brooklyn Rapid Transit Company, practically since 1913, when the dual subway contracts were signed. John H. Delaney, chairman of the board, explained that the construction of the line was called for by the dual subway contracts and said it would be the "most expensive, extravagant and useless piece of work ever undertaken by the city." The estimated cost of the line to the city will be $13,000,000 for 4,830 ft. of subway, from the Municipal Building to the entrance of the Whitehall-Montague Street tunnel.

Officers of the company have declared that construction of the line would enable it to increase its service by at least 50 per cent, by relieving the congestion on its lines at DeKalb Avenue, Brooklyn, and by utilizing two now unused tracks on Manhattan Bridge for loop operation.

Municipalization Recommended in Los Angeles

It is the lines of the Los Angeles Railway and not those of the Pacific Electric Railway, the purchase of which is being considered by the city of Los Angeles. This was made plain in a news article in the JOURNAL for May 14, page 877, but in the editorial comment in the same issue the name of the Pacific Electric Railway was inadvertently used. The statement in the JOURNAL further added that the purchase price, according to Dr. Wilcox, should be approximately $30,000,000. This is the figure at which recommendation of purchase has been made by Dr. Wilcox, and refers to the Los Angeles Railway, not the Pacific Electric Railway. The depreciated value of the Pacific Electric Railway is approximately three times this figure.

Eight Cents for James Green in Indianapolis

A finding by the Indiana Public Service Commission has decreed an increase of 8 cents an hour for James Green, an employee of the Indianapolis Street Railway. The decision was rendered in a case in which Green applied to the commission, under the railway contract, for redress of grievances. His pay was increased from 37 to 45 cents an hour. Robert I. Todd, president of the company, said that until he received the official copy of the ruling and had time to study it he could not tell to what extent it would affect other employees.

The order discusses the company contract, conditions surrounding Green's case and its relation to the Indiana Public Service Commission as a board of arbitration. Closer adherence is suggested by the commission to the spirit of provisions of the contract by both the company and the men so that "such difficulties would not arise."

The commission's order applies only to Green. A portion of the order suggests the company re-employ these men as rapidly as vacancies occur.

Green was one of a number of men who went on a strike more than a year ago, when the employees sought an increase in pay. More recently he has been on the extra board for the company.

P.R.T. in New Offices

Executive and general offices of the Philadelphia Rapid Transit Company are now located in the Equitable Building, at the northwest corner of Broad and Locust Streets. Movement of the office equipment and records of the company from the various offices now occupied took place over the week end. The three full days, May 28, 29 and 30, for making a transfer assured against delays of any consequence.

The eleven lower floors in the Equitable Building are to be occupied by P.R.T., while the twelfth floor will accommodate the offices of Mitten Management, Inc. P.R.T. executive offices will be located on the eleventh floor, while the various departments and clerical forces will be housed on the lower floors.

The centralization of the various offices of P.R.T. and its subsidiary companies will make for greater efficiency of operation. Offices of the company located at Eighth and Dauphin Streets, 1520 Spruce Street, Tenth and Luzerne Streets, Fifty-ninth and Callowhill Streets, Liberty Building and the Land Title Building will be vacated.

The lost and found departments of P.R.T. and of the Yellow Cab will be consolidated in the new building within a few weeks. Until this move can be made the lost and found departments of the various locations will continue to operate as at present.

Chamber of Commerce Against San Francisco Extension

Unanimous indorsement of the Spring Valley, Bernal cut and War Memorial bond issues was voted on May 26 by directors of the Chamber of Commerce of San Francisco. The Municipal Railway extension issue was opposed. The bond issues come before the people at the special election on June 14. The directors of the chamber urge the three first issues as a "progress measure." On the railway issue they said:

> We regret exceedingly that the voters have not been permitted to vote separately on the different street railroad projects, so that meritorious extensions could be approved without at the same time committing the city to unbusiness-like and impractical extensions, which would be a severe drain upon its resources.

Attention is called to City Engineer O'Shaughnessy's original recommendations for extensions costing $2,850,000. The difference between that sum and the $4,700,000 bond issue to be voted upon is said to be the cost of the "unnecessary and unprofitable extensions." The statement continues:

> If the people were to defeat the propose drailway extension bond issue, the city will be able later to submit a subsequent series of bond propositions for extensions, and though resulting in delay would not be as serious as the proposed reckless waste of the people's money.

Trial of Short-Haul Five-Cent Fare in Seattle

A short-haul 5-cent fare system will be tried out by the Seattle Municipal Street Railway, Seattle, Wash., in the downtown district, if plans which D. W. Henderson, superintendent, has recommended to the City Council, with the approval of Mayor Bertha K. Landes, are authorized by that body. Mr. Henderson asks the Council for permission to try the reduced fare plan for 60 days, beginning July 1. The plan provides for a loop route, with shuttle cars furnishing the service operating on a loop system. The fare will be 5 cents without transfer privilege. Passengers requiring transfer to through lines will be required to pay the full fare, 10 cents cash or 8⅓ cents token rate. Shuttle cars will be painted a distinctive color, so they will not be mistaken for through cars, and operation of cars on through lines now running through the business district will not be discontinued.

Mr. Henderson believes the plan will increase the railway's revenues by promoting use of the street cars for short trips in the business section. The plan has been discussed thoroughly with Mayor Landes, who believes it is worth a trial. Mr. Henderson has also asked the City Council for legislation which will make possible operation of express cars on the recently rebuilt Westlake Avenue North line. He requested authority to purchase two auto buses, for use in handling purely local traffic on Westlake Avenue North.

Rates to Be Revised.—The Conestoga Traction Company has filed with the Pennsylvania Public Service Commission at Harrisburg a revision of its passenger rates which will apply to both city and suburban lines in Lancaster County. The new rates will be slightly higher to the occasional rider who pays a cash fare of 7 cents. About the same fare will be charged to semi-regular riders who buy four tickets for a quarter, and will be considerably lower to those who ride regularly and who buy a weekly pass good for an unlimited number of rides for $1.10. The cash rate now is 6 cents.

New Wage Scale in Indianapolis.—By an agreement between John P. Tretton, superintendent of the Indianapolis Street Railway, Indianapolis, Ind., and a committee of thirteen men representing railway and bus employees, a new schedule of pay, increasing wages of these men 3 cents an hour, became effective on June 1. The scale approved at the meeting is the same as that fixed in an order by the Indiana Public Service Commission. The increase applies to all of the men who operate buses or street cars. The new minimum scale is 40 cents an hour and the maximum 45 cents.

Makes Suggestions for Traffic Control.—For the regulation of traffic on Olive Street, St. Louis, Mo., when that thoroughfare is widened between Twelfth Boulevard and Channing Avenue, Reyburn Hoffmann, traffic engineer, in his annual report to Director of Streets and Sewers Brooks, has recommended that only nine street car stops be allowed on Olive Street between Grand Boulevard and Twelfth Boulevard. Mr. Hoffmann predicts that Olive Street will become the main East and West traffic artery of the city and in order that street cars and automobiles may move swiftly and safely he believes that the number of car stops should be reduced to a minimum. His arrangement would allow street cars a speed of 15 m.p.h. and automobiles 20 m.p.h., on the average. Automatic traffic signals would be synchronized.

Fare Reduction Hearing Refused.—The Public Utilities Commission of the District of Columbia refused on May 26 the request of the Public Utilities Committee of the Federation of Citizens Associations that a public hearing be held on reduction of car fares for school children, sale on cars of three tokens for 20 cents and issuance of universal transfers. It claimed that neither the Capital Traction nor the Washington Railway & Electric is earning a fair return on its investments. The commission said that a public hearing on these questions would be inappropriate in view of the restricted income of the companies, inasmuch as two of them would amount to fare reductions, which would still further reduce the companies' income. Nevertheless, the commission ruled, if a public hearing should be called on any other question affecting either of the companies in the near future, the federation's suggestion in the call would be considered.

New Pamphlet Appears.—The first issue of the *Indiana Service News* appeared under date of May, 1927. It will be published monthly by the Indiana Service Corporation, Fort Wayne, Ind., with a threefold purpose. First, the company desires that there be some channel for giving employees news which cannot be issued in bulletin form, the second desire is to have a means by which each employee may learn what the company as a whole and in its various departments is doing, and, lastly, it is thought that the publication will acquaint employees with each other, and by cultivation of friendship increase the company's success.

Recent Bus Developments

Hearing to Be Held on Indianapolis Bus Purchase

The Indiana Public Service Commission is to conduct a hearing shortly in connection with the recent proposal by the Indianapolis Street Railway, Indianapolis, Ind., to purchase the stock of the Peoples Motor Coach Company for $500,000. The original petition was refused some time ago. The petition for rehearing was supplemented by an intervening petition signed by approximately 100 residents of the city, asking the commission to hear the case again.

The petition states that the commission erred in its method of determining the value of the coach company. The new petition offers no alteration in the proposed price of $500,000, which the commission held to be too high, but points out again that savings which would result through co-ordination of operation and elimination of duplication would be $117,000 a year. To the objection of the commission that 8 per cent interest on the notes to be issued by the purchasing company to pay for the property is too high, the petition points out that even this method would save $21,000 over the alternative one of selling a lower interest bearing security at a discount.

Gary Railways Would Abandon Express Motor Coach Route

Application for authority to discontinue motor coach service over a 6-mile route on Broadway, the main business street of Gary, Ind., was made to the Indiana Public Service Commission on May 31 by the Gary Railways. In maintaining an hourly, limited-stop express service on this line between outlying residential sections and the downtown business center, the company's petition states, an average daily operating loss of $50 has been incurred since the service was started April 18. It is alleged that the number of passengers per trip has seldom exceeded ten and that the average is only 2.7. Although a luxurious type of parlor motor coach equipment has been used in this service, failure of the line to do a paying business is attributed by officials of the company to intense private automobile competition and to the fact that a more frequent service is provided over a large portion of the route at a lower fare by the company's street cars.

Bus Expansion in Westchester

The Public Service Commission granted on May 31 the petition of the New York & Stamford Railway for approval of a declaration of abandonment of portions of its line in the village of Rye and the town of Mamaroneck, Westchester County, N. Y. This petition is part of a general plan of the railway to substitute buses for railway service in parts of its territory. Trolley service in Port Chester has already been abandoned and bus service substituted and permission was given on May 31 by the commission for bus service in Mamaroneck and Larchmont. This petition is for the abandonment of service in Larchmont and Rye by railway and the substitution of bus service. A petition for a certificate for operation of buses in Rye has not been acted upon because the company and the village authorities have not agreed upon the most feasible route.

Testimony at the hearings showed that the Rye Beach line and the Larchmont Manor railway lines had not paid operating expenses for a considerable period of time, and in an effort to minimize its loss as much as possible the company has adopted the policy of substituting buses on certain portions of its trolley lines.

The company is desirous of acquiring the capital stock of the County Transportation Company, Inc., which recently was granted permission to operate bus lines in the villages of Mamaroneck and Larchmont.

New Deal Likely in Miami

Final Argument Heard on Jitney Elimination—New Contract Between City and Company Suggested—Mayor Favors Eliminating Jitneys

FURTHER continuance of the jitney bus drivers' injunction suit against the city of Miami, Fla., was ordered recently by Circuit Judge H. F. Atkinson when Bart A. Riley, counsel for the jitney owners, named the Miami Beach Railway co-defendant in the action. Counsel for the railway asked for the continuance in order to prepare its case. The final hearing will now be held on June 10 instead of May 25 as originally set.

The suit was brought several months ago to restrain the city from enforcing a new transportation ordinance that would rule small automobiles operated for public hire from the downtown streets. Charges of a conspiracy between the city and the railway were made. Circuit Judge Atkinson referred the action to H. H. Eyles, general master, for sifting of the charges. The testimony was returned to the court recently. Although the city's bus contract with the railway was attacked in the bill, the railway was not named a defendant until a few days ago.

Miami's passenger transportation ordinance was scheduled to go into effect on Feb. 3. Immediately after its passage, however, the measure was attacked in a suit brought in Circuit Court by C. H. Wood, jitney bus driver, who represents 160 other persons engaged in the jitney bus business, requesting that the court prevent the city from enforcing the act.

Besides asking for temporary and permanent injunctions against the city, the bus drivers through their bill ask that the ordinance be declared a violation of the constitution of the United States and the bill of rights of the state of Florida; that the city be further enjoined from illegally expending any of the moneys of the city for the benefit of any private corporation; that the defendants be restrained from combining and confederating together with any person, firm or corporation for the purpose of restraining the transportation of persons for hire in the city, and other relief.

The city's contract with the Miami Beach Railway, a subsidiary of the Florida Power & Light Company, is attacked in the petition and declared to be illegal. It is charged that the City Commissioners have surrendered their law-making power in the contract and have bound the city to unlawful things. According to the jitney drivers the purpose of the new bus ordinance is to break down competition between jitney drivers and the Miami Beach Railway, which operates both cars and buses, all of which have seating capacities of more than fifteen persons each. It was further charged that the city in securing passage of the measure was motivated by a contract with the Miami Beach Railway which guarantees the company a minimum income in the operation of buses.

To this the commission answered that there was an oversupply of transportation in Miami which, in addition to increasing traffic congestion, was costing the taxpayers a considerable amount that could be materially reduced or eliminated entirely under a new system. The commission conceded, however, that the ordinance would work a hardship on present jitney operators and expressed a willingness to minimize this as far as the public interest would allow.

In this connection the Mayor said that for some time he had been in favor of an ordinance to prevent operation of jitneys, but denied that a conspiracy existed, or that the city authorized money for purchase by the railway of jitney bus drivers' rights. In referring to the railway's practice in buying up the rights, the chief executive said:

> I though they should give the jitney owners something. They didn't have to do it. I was glad to see it done because these boys had some investment and had suffered losses. There is too much traffic congestion downtown.

According to him, adequate transportation was the greatest need of the city when the contract was entered into with the railway. He told how transportation increased property values by making outlying sections accessible. This, he said, the railway was doing by operating buses in territory that was not as renumerative as other sections of the city.

Ever since the municipal bus service started more than a year ago, two problems have been involved in Miami's transportation situation. One was the demand of thousands of home owners and citizens that adequate and dependable transportation be furnished in all sections of the city at reasonable rates.

The other was that if such service was furnished its cost would probably be reflected in taxes.

The Miami Beach Railway is understood to have agreed to meet the City Commission half way or more on any reasonable proposal with respect to the modification of the operating arrangement between them, even to the probable extent of canceling its present charge against the city and trusting to the future prosperity and population of the city to overcome the deficit.

Under tentative plans the railway would continue to operate buses, but in a competitive field and without any guarantee against losses. The company also is under contract to operate the railway system in Miami on terms which prohibit it from charging more than a 5-cent fare. In return for the minimum fare guarantee the city leases its railway equipment to the company on a sliding rental scale, $3,500 for the year 1927, $4,500 for 1928 and $5,500 for 1929. The company maintains the transit lines and equipment, but the city is found to furnish new cars as needed.

A portion of the plan under consideration is an arrangement whereby the city would waive its annual lease charges and in turn be released from the purchase of new cars. The company would then link its railway and bus transportation into a unified system, maintaining both, furnishing all replacements and operating on a virtually independent basis. At present both the railway system and the bus service are operating at a loss, the records show.

Buses Not Sources of Revenue on Lincoln Interurban

Supporting his request for permission to abandon three buses as supplementary to his cars, J. M. Bramlette, general manager of the Omaha, Lincoln & Beatrice Railway, testified before the State Railway Commission that his experience with buses had been disastrous. The company put the buses in service on Oct. 19, 1926. The operating expenses per bus-mile up to May 1 were 20.12 cents, while the gross revenue was 18.27 cents, a loss of 1.85 cents. As drivers' wages were increased 5 cents an hour on May 1 the deficit was increasing, with the slack period approaching. Gross revenue for the period was $14,590, while operating expenses were $16,065.

Mr. Bramlette testified that the cost per bus-mile was favorably affected by the fact that he was general superintendent and general foreman as well as general manager. As a substitute for part of the bus service, which was largely competitive with the company's cars, he would speed up service between Lincoln and University Place during peak hours and would give through service instead of shuttle service run before the buses were installed.

The company desires to abandon Fourteenth and O Streets, Lincoln, its downtown terminus for many years, and to run its cars largely on the rails of the Lincoln Traction Company around a loop that keeps it off the main business street, but touches the shopping, hotel and theater districts.

Financial and Corporate

Control of Washington-Baltimore Road in New Hands

Application to take over the controlling interest, or 54 per cent of the stock, of the Washington, Baltimore & Annapolis Railroad through the medium of a holding company has been made to the Maryland Public Service Commission by the Consolidated Gas, Electric Light & Power Company, Baltimore. The commission has set June 3 as the date to hold a hearing on the application.

The petition filed with the Public Service Commission states that the shares the Consolidated plans to take over are held by Aldred & Company, New York bankers, who are prepared to sell at $1,135,802 cash.

Charles Markell, attorney representing the Consolidated, filed the petition with the commission. The holding company, known as the Baltimore Corporation of Maryland, filed a certificate of incorporation with the State Tax Commission shortly before the application was made to the Public Service Commission. The directors of the holding company will be members of the board of the Consolidated, which includes Herbert A. Wagner, Charles M. Cohn, Charles E. F. Clarke, John L. Bailey and F. W. Wood.

Under the terms of the plan submitted to the Public Service Commission the holding company would issue 45,433 shares of capital stock without par value, to be acquired later by the Consolidated for $1,135,825. Approval also is asked for the acquisition by the holding company of 18,148 shares of Washington, Baltimore & Annapolis preferred stock and 32,429 shares of common stock.

If the Consolidated obtains control of the railway it also will, at the same time, acquire the subsidiary companies operated by the electric railroad. These are the Annapolis & Chesapeake Bay Power Company, which serves a large territory between Baltimore and Washington; the Terminal Real Estate Company and the Maryland Development & Realty Company of Anne Arundel County.

The total mileage operated in 1926 by the railway was 147, with total car-miles of 4,479,856. Operating revenue, including the subsidiaries, totaled $2,564,047.29.

New Charter Sought for Old Cincinnati Line

The first step toward taking over the old Cincinnati, Georgetown & Portsmouth Railroad was made recently when the Cincinnati, Georgetown & Portsmouth Railroad applied for a charter at Columbus, Ohio. The road recently was sold at receiver's sale under direction of the Common Pleas Court and was bid in by J. P. Longon at $225,000. Capital of the new concern consists of 500 shares of no par value stock. The Cincinnati, Georgetown & Portsmouth is a 42-mile interurban connecting Cincinnati with Georgetown, Ohio. Indications are that operation will continue under control of new owners.

Reduction in Corporation Income Tax Urged

A specific demand for the reduction of the corporation income tax, backed by the business interests represented in the 1,500 member organizations of the Chamber of Commerce of the United States, will be made upon the new Congress when it assembles next December. This move was decided upon at a meeting of the special committee on taxation of the chamber, meeting in Washington.

A reduction of the corporation income tax rate to 10 per cent from the 13½ per cent rate now in force will constitute the main item on the business program for tax revision. Such a reduction, it was asserted, should be made even if it were to involve a deficit at the end of the fiscal year, on the ground that the imposition of so heavy a burden upon productive enterprise is wrong in principle and retards the economic development of the country.

According to the present outlook, the committee believes a lowering of the rate will not lead to a shortage in the government's income. It is expected that the Treasury's books on June 30 will show a surplus of $450,000,000, while the 3½ per cent reduction in the corporation income tax would amount to approximately $325,000,000, leaving a margin of $125,000,000 for reductions in other directions, such as the repeal of the federal estate tax and the war excise taxes on particular business.

Earnings in Tennessee Increase

The gross earnings of the Tennessee Electric Power Company, Chattanooga, Tenn., for the year ended Dec. 31, 1926, included transportation earnings of $3,284,487, against $3,258,165 for the year previous. This figure includes operations by the Nashville Railway & Light Company and other subsidiaries of the Tennessee Electric Power. The annual report to the stockholders states that approximately 27 per cent of the gross earnings was derived from the transportation business. During the year the transportation systems in Nashville and Chattanooga carried 45,615,025 passengers, a gain of 125,034 passengers over 1925. Comparative figures showing the revenue passengers carried during the past five years are as follows:

1922	45,680,057
1923	45,929,865
1924	45,057,283
1925	45,489,991
1926	45,615,025

In order to improve service to the public, the company and its subsidiaries expended $7,385,889 in 1926. Of this amount approximately 12 per cent was used in the transportation department. This included the purchase of 20 modern light-weight, double-truck, one-man, two-man operated rail coaches, of which ten were placed in operation on the Nashville and ten on the Chattanooga city transportation systems.

During the year the capital structure of the company was simplified and additional money received through issue of common stock, practically all of which was purchased by the Commonwealth Power Corporation. The company sold during the year a net total of $1,770,100, par value, of first preferred stock on the customer-ownership plan. At the close of 1926 the total amount of preferred stock subscribed on the monthly payment plan was $897,000, par value, on which $608,350 remained to be paid in 1927 by the subscribers.

New Jersey Subsidiaries Report Gain

Public Service Rail and Bus Passengers Show Increase of 34,000,000—Maintenance Work Continues—Progress Noted in Co-ordinated Rail and Bus Service

OPERATING revenues of subsidiary companies of the Public Service Corporation of New Jersey for the twelve months ended Dec. 31, 1926, were $106,303,209, against $94,715,525 for the year previous. This was disclosed in the eighteenth annual report, which shows a net increase in surplus of $2,666,318 after payment of dividends of $6,067,033 on the common stock of the Public Service Corporation of New Jersey. For each of the quarters ended March, June and September $1.25 per share was paid on the common stock. An exchange of the common stock on the basis of three shares for each share outstanding was made during October, and for the quarter ended Dec. 31, 1926, a dividend of 50 cents a share was paid.

Readers of the ELECTRIC RAILWAY JOURNAL, though interested in all operations of the New Jersey system, are especially concerned with the transportation properties, which serve 188 municipalities housing 2,493,564 people. Thus the figures in the accompanying tables reflect primarily activities in the bus and railway fields.

NEARLY 600,000,000 PASSENGERS TRANSPORTED

The number of passengers carried on Public Service cars and buses in 1926 was 597,330,872, exceeding by more than 34,400,000 the number carried in 1925. This increase reflects to some extent business added through purchase of additional lines and buses before operated by independent owners, but at the same time demonstrates a satisfactory increase in riding throughout the territory served. Progress is reported in the co-ordination of street car and bus service, and the result shows in the more favorable financial statements of Public Service Railway and the Public Service Transportation Company. The task is, however, by no means complete and can be fully accomplished only by greater co-operation from state and municipal authorities than has yet been extended. The complete situation as it affects the public and the companies was put before the State Board of Public Utility Commissioners in a petition filed with the board on Dec. 14, in which specific suggestions for relief were made.

On Sept. 13 a wage agreement between both car and bus employees, members of the Amalgamated Association. was signed, which, with some slight modification, keeps in force for a period of three years from Oct. 1, 1926, the rate of wages and working conditions that had been in effect since Oct. 1, 1923.

STATEMENT OF MILEAGE OF THE PUBLIC SERVICE RAILWAY AS OF DEC. 31, 1926

			Miles
First main track			536.122
Second main track and turnouts			296.287
Connections, crossovers, wyes and loops			12.090
Carhouse and yard tracks			46.186
Total			890.685
Total number of passenger cars available for operation:	Closed—1,854	Open—277	
Number of new passenger cars since 1903:	Closed—1,493	Open—327	
			Miles
Track reconstructed with new rail during 1926			13.395
Track reconstructed with same rail during 1926			1.631
Extensions built during 1926			2.173

On Dec. 3, 1926, a "no accident bonus system" was made effective for car and bus operators, under the terms of which each operator receives $1 for each week in which his accident record is clear and a total of $60 for a 52-week clear accident record.

The report states the property of Public Service Railway has been well maintained during the year and a number of improvements made for the betterment of service. The most notable of these was the extension of track in Washington Street, Newark. In connection with the Washington Street track extension, a passageway was opened along the subway, between Washington and Halsey Streets, to give access to west-bound cars having their terminus in Public Service Terminal and a station was constructed in the subway for east-bound passengers, which gives access through the Kresge department store building to the west side of Broad Street.

More than 13 miles of track was reconstructed with new rail during the year and 1.63 miles with old rail. Track extensions of 2.17 miles were made.

A total of 693 cars were completely overhauled, 1,541 received general repairs, 858 were painted, 30 additional cars were converted for one-man operation and snow scrapers were installed on 349 cars.

The scope of Public Service Transportation Company's operations was materially enlarged during the year by the taking over of independent lines and buses and by the starting of new lines. In addition to the purchase of individual buses on a number of lines, the company took over entirely on May 3 the Arrow bus line, operating between Newark and Paterson, and on May 7 the Peters bus line, operating between Elizabeth and Rahway. On Jan. 15 the River Road line of buses was put in service between George Road and the Edgewater-Fort Lee boundary line. On Jan. 24 the High Street line was put in operation between Bloomfield Avenue and High Street and the Produce Market, Newark. On April 26 the Bergen bus line was put in operation between Hackensack and the Weehawken ferry and on Dec. 27 the Edgewater line was put in operation between Ridgefield and Edgewater.

Bus equipment of the company was greatly improved during the year. After careful investigation of various types, 395 gas-electric buses were purchased and substituted for unsatisfactory equipment taken over, or put into service on new lines. Bodies for 189 of these buses were built in Public Service shops.

A large amount of construction and

TRANSPORTATION STATISTICS CONTAINING OPERATIONS OF PUBLIC SERVICE SYSTEM IN NEW JERSEY

Year	Trolley Passengers	Bus Passengers	Total	Trolley Mileage	Bus Mileage	Total	Trolley-Hours	Bus-Hours	Total	Passenger Receipts per Trolley-Mile in Cents	Passenger Receipts per Bus-Mile in Cents
1917	476,974,983	....	476,974,983	56,087,403	....	56,087,403	6,021,225	....	6,021,225	32.44	.....
1918	451,220,806	....	451,220,806	54,039,150	....	54,039,150	5,698,089	....	5,698,089	36.00	.....
1919*	396,689,234	....	396,689,234	57,644,927	....	57,644,927	6,039,453	....	6,039,453	39.29	.....
1920	453,534,694	....	453,534,694	60,798,743	....	60,798,743	6,539,207	....	6,539,207	43.21	.....
1921	435,679,801	....	435,679,801	58,309,883	....	58,309,883	6,212,276	....	6,212,276	44.11	.....
1922	410,212,814	....	410,212,814	56,419,982	....	56,419,982	5,983,122	....	5,983,122	45.59	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75	22.43
1924	427,828,444	69,383,643	497,212,087	53,945,515	15,704,663	69,650,178	5,662,340	1,928,498	7,590,838	41.04	26.13
1925	416,788,621	146,053,237	562,841,858	50,115,119	27,506,493	77,621,612	5,402,008	3,273,801	8,675,809	41.32	27.41
1926	397,690,308	199,640,564	597,330,872	45,632,230	36,082,405	81,714,635	4,929,558	4,013,602	8,943,160	42.85	30.05

* Mile zone system in effect from Sept. 14 to Dec. 7.

repair work on equipment was also done by the company. Two hundred and seventy-six buses were completely overhauled, 1,248 partially overhauled, 389 new bus bodies painted, in addition to the repainting of 366, and 652 gas engines, in addition to those in overhauled buses, were rehabilitated. Besides substantial additions were made to the garage and terminal equipment of the company.

In the matter of rates the report states that on Dec. 14, 1926, Public Service Railway and Public Service Transportation Company presented to the board a joint petition for relief, in which the financial and operating conditions of the two companies were set forth and a number of suggestions made for public co-operation in the adoption of measures which would either increase the revenue or decrease the expenses of the companies sufficiently to obviate the necessity of a general increase in rates. The changes in rates were to be effective on Jan. 1, 1927, but the Utility Board suspended them for three months and set them down for hearing on Jan. 19, 1927.

INCOME ACCOUNT OF THE PUBLIC SERVICE RAILWAY AND SUBSIDIARIES FOR THE TWELVE MONTHS ENDED DEC. 31, 1926

	Public Service Railway	Public Service Transportation Company	Public Service Railroad	Other Affiliated Companies	Total
Operating revenues	$19,974,905	$10,944,443	$283,513	$1,859,736	$33,062,600
Operating expenses	$9,506,463	$6,124,297	$71,700	$698,765	$16,401,226
Maintenance	2,828,664	2,884,287	59,732	75,286	5,847,971
Taxes	2,181,887	608,665	46,342	177,277	3,014,174
Depreciation	801,113	1,094,962	....	167,500	2,063,575
Operating revenue deductions	$15,318,129	$10,712,213	$177,775	$1,118,829	$27,326,948
Operating income	$4,656,776	$232,230	$105,738	$740,907	$5,735,652
Non-operating income (exclusive of dividends of affiliated companies)	150,058	7,867	1,137	25,093	184,157
Gross income	$4,806,835	$240,098	$106,875	$766,001	$5,919,809
Income deductions (bond interest, rentals and miscellaneous interest charges)	4,917,136	152,580	130,347	63,414	5,263,480
Net income or loss	†$110,301	$87,517	†$23,472	$702,586	$656,329
Profit and loss accounts (excluding dividends)	*22,046	1,921	*7,974	1,539	*26,559
Surplus (before dividends)	†$88,255	$85,595	†$15,498	$701,046	$682,888
Intercompany dividends	*324,574	....	....	324,574	....
	$236,318	$85,595	†$15,498	$376,472	$682,888
Dividends paid unaffiliated interests (directors)	....	....	....	226	226
Net increase or decrease in surplus	$236,318	$85,595	†$15,498	$376,246	$682,662

* Credit. † Deficit.

The operating revenues of subsidiary transportation properties of the Public Service Railway are as follows:

1917	$19,394,025	1922	$27,544,509
1918	20,831,762	1923	23,105,003
1919	24,140,356	1924	28,257,177
1920	27,882,095	*1925	30,517,918
1921	27,404,867	1926	33,062,600

* Change in classification of accounts effective Jan. 1.

Foreclosure Sale in St. Louis Deferred Until Aug. 1

The absence of a qualified bidder for the properties of the United Railways, St. Louis, Mo., has resulted in a postponement of the foreclosure sale until Aug. 1, according to an announcement of Special Master William L. Igoe. The postponement was anticipated because of the failure of the city administration and the St. Louis Public Service Company to agree on a new franchise and also because of the pending proceeding before the Missouri Public Service Commission on the application of Receiver Rolla Wells for an 8-cent fare. The St. Louis Public Service Company has practically completed its financial structure for the purchase and operation of the system, but will probably await the disposition of the franchise and the fare questions before bidding in the properties.

Easements Case Put Over.—The Maryland Public Service Commission has postponed the hearing on the easements valuation case of the United Railways & Electric Company, Baltimore. The case was scheduled to be heard on May 26, but was postponed because of the inability of one of the legal representatives of the United to attend. The date for the heaving has not been set.

Texas Acquisition Rumored.—It is reported that the Eastern Texas Electric Company, a Stone & Webster property, operating in Beaumont, Tex., is to take over the Port Arthur Traction Company, provided the franchise situation is worked out satisfactorily. The Port Arthur Traction Company operates 7 miles of line in Port Arthur, Tex.

Amends Part of Receivership Decree.—In order to correct an error, Federal Judge Faris of St. Louis, Mo., on May 26 modified his decree in the United Railways receivership case so that interest on claims should not be paid for the period after the institution of the receivership suit in 1919. The original decree provided for the payment of interest to 1926. The error was caused by the attorneys overlooking numerous court decisions which held that interest on claims stopped with the appointment of receivers.

Would Abandon Tracks and Sell Certain Properties.—The Pacific Electric Railway has applied to the California Railroad Commission for authority to abandon and remove its tracks on Third Street and Broadway in the city of Santa Monica, and also for authority to sell certain property along its Huntington Beach Line in the city of Huntington Beach.

Objects to Track Removal.—A number of the city officials and citizens of Watertown, Wis., appeared before the Railroad Commission to protest against the abandonment of railway service in Watertown. The City Council has granted the Milwaukee Electric Railway & Light Company permission to remove tracks in connection with the company's $100,000 rapid transit improvement program, which includes provision for local service over interurban lines only. The commission took the case under advisement.

Would Abandon Part of Line.—Application was made to the Public Service Commission on May 20 by the Geneva, Seneca Falls & Auburn Railroad, Inc., and L. S. Hoskins and James M. Ryan, as receivers, for approval of a declaration of abandonment of part of its line in Seneca Falls, N. Y. The company alleges that this part of its line is no longer necessary or convenient to the public.

Defunct Line Bought.—Eleven miles of steel rails and other track equipment of the Murphysboro & Southern Illinois Electric Railroad were bought at receiver's sale recently by the Sonken-Galamba Corporation, Kansas City, which will sell the material as scrap. The line was built during the war at a cost of $300,000 and operated between Murphysboro and Carbondale, Ill. In later years a hard-surfaced highway paralleling the railway brought about a reduction in the passenger business until the road eventually went into receivership.

Abandonment Case Reheard.—Rehearing of the application of the Niles-Mineral Ridge branch of the West End Traction Company, Columbus, Ohio, to suspend operations was completed before the State Public Utilities Commission on May 23. The commission will conduct a further examination before making any decision. The Trumbull County Commissioners agree to withdraw an assessment of $60,000 against the company for use of a viaduct. It was this assessment which was advanced by the company as a reason for wishing to cease operations. Paul Z. Hodge, City Solicitor of Niles, and William McLain, Warren, Assistant County Prosecutor of Trumbull County, were strong in their advocacy of the continuation of service.

Would Purchase Leased Line.—The Capital Traction Company, Washington, D. C., informed the Public Utilities Commission of the District of Columbia on May 25 that it had entered into a contract with Charles Selden, owner of the capital stock of the Washington & Maryland Railroad, for purchase of the company for $98,000. This is contingent on the approval of the commission and of the Public Service Commission of Maryland. The line about to be purchased runs from Fourteenth and Kennedy Streets, N. W., to Takoma Park, Md. It has been operated by the Capital Traction Company under lease for many years. It is proposed by the Capital Traction, after buying the line, to run cars only to Third and Kennedy Streets, N. W., and from that point operate buses to Takoma Park.

Legal Notes

CALIFORNIA—*Last Clear Chance Doctrine Not Considered Applicable.*

In a pedestrian's personal injury action against a street car company, last clear chance doctrine is inapplicable, if motorman did not see the plaintiff, since such doctrine is based on the fact that defendant, knowing of plaintiff's danger, had opportunity to avoid the accident. In determining the speed of an electric train, in a personal injury action, the jury could consider the fact that the noise and rumble of a three-car train would accentuate the idea of speed entertained by many people, and that their testimony might not be so reliable as that of the motorman, notwithstanding that the latter might be classed as an interested witness. [Tolkover vs. Pacific Elec. Ry., 254 Pac., 926.]

ILLINOIS—*Defines City's Part in Relocation of Tracks of Street Railway.*

In proceedings to require street railways to remove tracks to center of street, where street was to be widened on one side, because widening and track removal were necessary for public convenience, the fact that commissioner, under ordinance, had approved old location of tracks did not estop city to require that tracks be relocated. This is the ruling since the ordinance provided that nothing therein should be construed to deprive the city of police power. [People vs. Chicago City Ry., 155 N. E., 783.]

KANSAS—*Negligence of Driver of Auto Blamed for Collision with Street Car.*

A street car was struck by an auto in which plaintiff was a passenger, at a point 4 or 5 ft. from the rear end. The testimony of the driver of the auto was that he was driving in low gear at not more than 10 miles an hour and could have stopped his machine in 6 ft. The trolley car was 35 ft. long. The driver of the auto saw the street car before the collision and had observed its movement. In view of the above, it was held that the company could not be held liable and that the driver of the auto was clearly negligent. [Mallory vs. Fleming, 253 Pac., 1090.]

MARYLAND—*Only at Certain Times Does Accumulation of Snow and Ice on Steps Mean Negligence.*

Plaintiff was injured while alighting from an electric interurban train. She claimed that the accumulation of snow and ice on the steps had made them slippery, causing her to fall; that the carrier at times cut off the snow and ice from the steps before the passengers were discharged, but that it did not do so on the occasion in question. It was held that it is unquestionably the general rule that to require a railroad operating its trains through a storm to keep its platforms and approaches free at all times from ice and snow would impose upon it an unreasonable and impracticable burden, which would seriously interfere with the adequate and efficient discharge of its duty as a common carrier; but that it is also true that when the carrier has a reasonable opportunity to discover and correct unsafe conditions caused by the deposit of ice and snow on the steps, platforms and other approaches to its cars, and fails to do so, it is negligent. [Washington, Baltimore & Annapolis Elec. R. Co. vs. Fitch, 136 Atl., 529.]

MASSACHUSETTS.—*Responsibility for Injuries Sustained by Passenger Discharged at Irregular Stopping Place.*

Decedent was discharged from a street car at an irregular stopping place, in a parkway, where snow was packed near the tracks. He crossed over the outbound tracks and was walking on the inbound tracks when he was struck by a car traveling on those tracks. The operator of the outbound car and two others testified that they looked and saw no inbound car approaching. The court held that decedent was not a trespasser as to the railway and it was presumed that he exercised due care; that in view of the above testimony a jury question was presented as to his contributory negligence. [Poppell vs. Boston El. Ry., 155 N.E., 267.]

MISSOURI—*Duty of Person Approaching Tracks Defined.*

A person nearing street railway tracks is in duty bound to listen and look in both directions for cars, providing looking or listening would enable him to discover their approach, and failure to do so is contributory negligence. [Hoodenpyle vs. Wells, 291 S. W., 520.]

NEW JERSEY.—*An Injunction Granted Against Objectionable Parking.*

An injunction was allowed a tenant of a property against a bus owner who parked his buses in the street in front of the leased premises and whose drivers molested complainant's customers and whose starters drove complainant's customers away, causing loss of business, customers and profits. [Livingston vs. Stoddard, 136 Atl., 205.]

NEW JERSEY—*Evidence of Intoxication in Collision Admitted.*

In an action by an auto passenger against a street railway for injuries received in a collision between the auto and a trolley car, evidence as to whether the plaintiff and the owner of the auto were drunk at the time of the accident was held admissible. [Damchuk vs. Public Service Ry., 136 Atl., 604.]

NEW YORK—*Rules on Operating on Routes of Other Companies.*

Use by a street railway corporation of another's route, whether as coadventurer, principal or licensee, necessarily involved agreement between corporations for use or operation by one of franchises of other, is prohibited by public service commission law. [Berkey vs. Third Avenue Ry., 155 N. E., 914-88.]

OHIO—*When Good Will of Business Is Credited.*

A certificate of convenience and necessity to operate a motor bus line over a portion of the public highways is neither property nor a business, and good will does not attach thereto; nor does operation over the public highway under such certificate entitle the holder thereof to credit his capital assets with any sum for good will or going concern. [Penn. R.R. Co. vs. P. U. Comm. of Ohio, 155 N. E., 695.]

RHODE ISLAND—*Convenience Necessity Is Determined by Commission.*

In passing upon public convenience and necessity, the commission must consider whether a proposed route is suited to and tends to promote the accommodation of the public and also whether it is reasonably required to meet a need for such accommodation. It is justified in considering the existing means of transportation as to its substantial character and its probable permanence, also the investment of capital made by the owners of such existing means, the nature of the service that is being rendered, and, if such service is adequate, what will be the probable effect of meeting competition into a field now adequately served, and what effect such competition will probably have upon the receipts of existing lines of transportation, and as to whether, in the face of further competition, the adequacy of the existing service will be continued. In this case the findings of the commission that the service of the electric trolley and steam railways was sufficient were affirmed. [Abbott vs. P. U. Comm., 136 Atl., 490. See also Columbus Ry., Power & Light Co., vs. P. U. Comm. of Ohio, 155 N. E., 647.]

TEXAS—*Adult Standee Near Track Needs No Warning of Car Rounding Curve.*

Plaintiff alighted from a street car and stood near the tracks, where she was struck by the car as it swung around a curve. It was held that after she alighted from the car and was standing on the pavement she was no longer a passenger and the company did not then owe her the duty of carrier and passenger; that the motorman may assume that an adult person, standing near the track, apparently able to see, hear and move, and having notice of the approach of the car and the existence of the curve, will avoid being struck as the car swings around the curve, and has no legal duty to warn such person of possible danger because of the swing. [El Paso Electric Co. vs. Ludlow, 291 S. W., 619.]

WASHINGTON—*Surrender of Franchise—Return of Deposit.*

In the case of a city purchasing a street railway under an ordinance, it was held that the city was not entitled to the emergency fund deposited under franchise, where the sale constituted the surrender of franchise, since the purpose of the deposit having ceased, the fund became a chose in action, to which city had no defense under the exception which applied to personal property. [Puget Sound Power & Light Co. vs. City of Seattle, 253 Pac., 1083.]

Personal Items

Cincinnati Car Company Officials

Reviews of Careers of Men Changed in Status Following Death of W. Kesley Schoepf

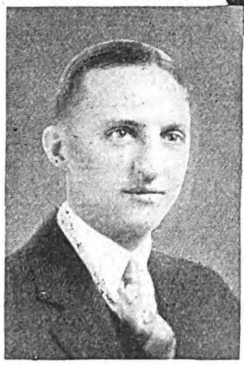
Henry L. Sanders, former vice-president of the Cincinnati Car Company and now president of that company, worked side by side with W. Kesley Schoepf up to the day of the untimely death of that powerful and successful leader. He began his association with the Schoepf companies in 1905, as assistant purchasing agent. Mr. Sanders' education did not include college training. He entered the transportation field in 1893, in the accounting department of the Atlantic Coast Line Railway. When the Spanish-American war broke out he left this position to serve his country in the navy. He was made a pay clerk and was given charge of the purchasing in the Port Royal naval yard.

This experience in accounting and purchasing fitted him for his appointment to assistant purchasing agent for the Cincinnati companies under Mr. Schoepf's control, viz., the Cincinnati Car Company, Cincinnati Traction Company and the Ohio Traction Company. In 1910 he was made treasurer of these three companies, a few years later their auditor, and from 1921 until the reorganization of the Cincinnati traction companies in November, 1925, he served as vice-president in charge of all accounting and financing. When Mr. Schoepf relinquished his connection with the railways in Cincinnati Mr. Sanders was made vice-president of the Cincinnati Car Company and served with it in that capacity up to the time of his election as president.

Ability to pick the most capable men and to hold their confidence and respect has been one of the factors in his success. When a problem presented itself he was never satisfied with anything but an expert's solution. In his own work he has always been very accurate and thorough. He gained his complete knowledge of the industry through his ever-present desire to get to the bottom of things.

A. L. Kasemeier, re-elected vice-president in charge of sales, also has a fine record in the Schoepf companies. His official positions were auditor, treasurer and later assistant general manager of the Cincinnati Car Company. In 1924 he was elected vice-president in charge of sales, in which position he will continue to serve this company.

J. Howard Elliott, elected vice-president in charge of production and purchases, had served the car company as general manager in charge of production for the past few years. Mr. Elliott joined the Cincinnati Traction Company in 1907 as an engineer and draftsman, after completing his education at the University of Cincinnati. He was transferred to the car company in 1917 as assistant superintendent of the shops. His father, Thomas Elliott, was formerly vice-president and general manager of the car company, but is now president of the Continental Cotton Gin Company, Birmingham, Ala. Thomas Elliott, however, continues to serve the company in a consulting capacity on problems of engineering and design.



E. C. Bernhold

J. H. Elliott

A. L. Kasemeier

In oval—H. L. Sanders

The office of treasurer was assigned to E. C. Bernhold, who was formerly secretary. He will continue his duties as secretary, combining that office with treasurer. Mr. Bernhold's record with the company is an enviable one. His work came to the attention of Mr. Sanders shortly after he started with the Cincinnati Traction Company in the accounting department. The only interruption in Mr. Bernhold's connection with the car company since 1906 was during the World War, when he joined the Machine Gun Battalion as a private and later served as second lieutenant in action in France. In 1925 he was elected secretary of the car company.

Among the other officials whom Mr. Sanders has retained in his employ are Charles J. Ellis, who will be chief engineer and assistant to the vice-president in charge of production, and Dave M. Ritchie, who will be sales engineer and assistant to the vice-president in charge of sales. Mr. Ellis has been with the company since 1912 and Mr. Ritchie since 1913. S. E. Reith will continue as assistant secretary and assistant treasurer.

On this solid foundation of competent assistants Mr. Sanders will continue to build his organization and to keep it in the front ranks of car builders. In an interview, he was loath to make any prophecies, but he did say:

> We plan to continue operation with the same personnel and with the same program of building cars that are safe and that meet the public's demand for comfort. We will continue to take into our organization men of the caliber of those now serving us. We believe in the co-operative plan of education which is followed by the University of Cincinnati in its College of Commerce and Engineering. Many of these co-operative students are in our employ and we are getting only the most gratifying results.

G. B. Cortelyou Chairman Joint Utility Committee

George B. Cortelyou, president of the Consolidated Gas Company, New York, has been elected chairman of the joint committee of National Utility Associations, representing the gas, electric and street railway industries of the United States. Philip H. Gadsden, vice-president of the United Gas Improvement Company, Philadelphia, has been elected vice-chairman of the committee proper and chairman of the executive committee. Stephen Davis, formerly judge of the Supreme Court of New Mexico and solicitor of the Department of Commerce, has been appointed counsel of the committee. The Joint Committee of National Utility Associations was organized soon after the war ended. It succeeded the National Committee on Public Utility Conditions, which was organized during the war to meet the new and complex problems thrust upon the utility industry by the war. That committee, composed of P. H. Gadsden as chairman; E. K. Hall and H. H. Crowell, not only rendered very effective service to the public, but enabled the industry to co-operate with the government in all matters looking to the prosecution of the war.

It was in recognition of the great value of co-ordinated effort in all matters affecting the industry as a whole that the joint committee was formed on the discharge of the national committee at the close of the war. The joint committee is representative of the American Gas Association, the National Electric Light Association and the American Electric Railway Association.

Harry Reid's Accomplishments Reviewed at Dinner

Harry Reid, president of the National Electric Power Company, was the guest of honor at a dinner given at the Engineers Club in New York on June 2, as a token of recognition and esteem by his friends in the utility industry. The occasion was to welcome him to the fast-growing ranks of utility executives who have been brought to the country's financial center through their accomplishments in the far-flung field of the industry. Many out-of-town friends came to join in the testimonial of good will. J. N. Shannahan, past-president of the American Electric Railway Association, presided. Speakers included B. C. Cobb, Thomas J. Walsh, James H. McGraw, Frank W. Smith, L. S. Storrs, George Chappell and Mr. Reid.

The guest of the evening was characterized as a progressive. His record of accomplishments as president of the Interstate Public Service Company and the Kentucky Utilities Company was reviewed to illustrate the reasons for his promotion to a position of broadened responsibilities. This recognition of demonstrated ability was considered one of the foundation stones that has made for stability in the utility industry.

Harry Reid

Harry Reid came to New York City early in the current year, when he succeeded Albert Emanuel as president of the National Electric Power Company. At that time other changes were made in the personnel of the officers and directors of the company. These changes were, of course, the forerunner of the removal of Mr. Reid to New York, where he now makes his headquarters.

Mr. Reid has long been in the limelight in electric railway affairs. Three years ago he was made president of the Central Electric Railway Association. At that time he was president of the Interstate Public Service Company, operating between Indianapolis and Louisville, and also president of the Kentucky Utilities Company.

Mr. Reid entered the utility field at the age of 21 as cashier with the Fulton County Gas & Electric Company. In the course of the years he became identified with utility operation in Versailles and Lexington, Ky. It was through his efforts that the Insull interests turned their attention to that state and some time later the Kentucky Utilities Company became a part of the Insull holdings. At that time Mr. Reid was made president. Later the properties, comprised in the Interstate Public Service Company, were purchased and Mr. Reid became president of that company in 1917.

Mr. Reid's career was reviewed in detail in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 2, 1924, page 198.

Managing Director Storrs Honored

Lucius S. Storrs, managing director of the American Electric Railway Association, received the honorary degree of doctor of engineering at the University of Nebraska, Lincoln, Neb., on May 28. Chancellor Avery conferred the degree upon the occasion of the commencement exercises of the university and the dedication of the new museum to be known as Morrill Hall. Mr. Storrs was graduated with the degree of A.B. from the University of Nebraska in 1890, taking the scientific course. Later the degree of A.M. was given to him by his alma mater.

Three New Vice-Presidents for General Electric

The election of three new vice-presidents and the retirement of two executives of the General Electric Company were announced by Gerard Swope, president, following a meeting of the directors on May 25. C. C. Chesney, manager of the Pittsfield works; W. R. Burrows, associate manager of the incandescent lamp department, and C. E. Eveleth, manager of the Schenectady works, were elected vice-presidents of the company, taking on responsibilities in the manufacturing department. F. C. Pratt, vice-president in charge of manufacturing, and H. F. T. Erben, assistant vice-president of the manufacturing department, have retired. The other officers of the company were re-elected at the meeting.

A. T. Bagley Heads Adjustment Department in Kansas City

Arthur T. Bagley, former superintendent of employment and records of the Kansas City Railways, Kansas City, Mo., is now active head of the new adjustment department of the Kansas City Public Service Company, which replaced the claim department on April 6. Mr. Bagley's new title is manager of the adjustment department, and he reports directly to C. L. Carr, general solicitor.

Mr. Bagley joined the organization on Jan. 1, 1921, as superintendent of personnel, and shortly thereafter was placed in charge of the employment and records department. For 13 years prior to that date he was with the Department of Justice as a special agent and later as agent in charge of the department's Kansas City office. Prior to this connection with the Department of Justice, Mr. Bagley was with the War Department on harbor improvement work and the U. S. Geological Survey.

A. J. Lundberg Also Vice-President at Oakland

Alfred J. Lundberg, whose succession to the Key System Transit Company, Oakland, Cal., was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 28, 1927, has also been elected vice-president of the company.

His first business connection was with the Bank of San Francisco, which later was absorbed by the Bank of Italy. He entered the employ of the bank in 1909 and in 1910 became an employee of the state banking department under Alden Anderson, superintendent of banks. A year later he became secretary of Herbert Fleischhacker of the Anglo and London Paris National Bank in San Francisco, remaining in that capacity until 1912.

In the latter year he accepted a clerkship in the brokerage firm of J. Barth & Company in San Francisco, becoming a partner in that concern in 1926. Associated with Mr. Lundberg in the partnership of J. Barth & Company are Gustav Epstein, Harry C. Clayburgh, Richard O. Simon and James D. McDonald. Barth & Company now represent the majority of stock in the Key System and Messrs. Epstein and Clayburgh are associated with Mr. Lundberg in the directorate of the railway.

A. J. Lundberg

Alfred J. Lundberg was born in San Francisco. He received his education in the public schools of his native city. He was the first president of the San Francisco Stock and Bond Exchange Institute and is a member of the San Francisco Commercial Club and other well-known organizations.

R. W. Garvin Directs Monongahela West Penn Publicity

Ray W. Garvin, Clarksburg, has been appointed manager of the public relations department of the Monongahela West Penn Public Service Company, Fairmont, W. Va., to succeed Major Earl H. Smith, whose resignation became effective April 1 last. In his capacity as manager of the public relations Department Mr. Garvin will have charge of all the public relations work and activities of the company of every nature and description, with general supervision of advertising and advertising expenditures.

Mr. Garvin was appointed to the Monongahela West Penn family from the editorial staff of the Clarksburg *Exponent*, with which newspaper he has been associated in several capacities over a period of years. He also has been connected with the *Telegram* in Clarksburg and the *Times* in Fairmont.

In addition to his newspaper work he has engaged in general publicity work and has also devoted some time to politics. At present he is the only Democratic member of the West Virginia House of Delegates from Harrison County, and in 1923 he was also a member of the House of Delegates, being at that time the youngest member of the Legislature.

Mr. Garvin served his apprenticeship as a printer, and is still a member of the International Typographical Union, although it is more than ten years since he worked at the trade.

Judge Joseph Coult, who has been claims attorney for the Public Service companies of New Jersey since 1922 and associated with the organization since 1913, has resigned to take up the practice of law with David Satz under the firm name of Coult & Satz. Judge Coult was admitted to the bar in 1901 and served as judge of the Court of Common Pleas of Sussex County before forming a partnership with Thomas Woodruff in Newark for public practice. He went to the Public Service Dec. 1, 1913, as trial attorney. He became claims attorney June 15, 1922.

In Memoriam

As a result of an error the name of John J. Stanley, president of the Cleveland Railway, was omitted from the list of those who answered the call of their maker in the year just closed as published in the ELECTRIC RAILWAY JOURNAL for May 28, page 980. Mr. Stanley, who died during the convention of the American Electric Railway Association in Cleveland last October, was a former president of the association. There is no need to expatiate again on the man as a character, on his ability or on the results he achieved, but the editors do desire to express to his friends and associates the deep regret they feel at the inadvertent omission of his name from the list as originally published.

Ernest Stenger Dead

Head of Denver Tramway and Former Receiver of That Property Succumbs to Pneumonia After Illness of Only Two Days

ERNEST STENGER, president of the Denver Tramway, Denver, Col., died in that city on May 28, of pneumonia. Forty-eight hours previously he was seated in his office discussing business with Vice-President Robertson.

Mr. Stenger went to the Denver Tramway as president on Sept. 29, 1920, from the Union Pacific Railroad, for which he had been superintendent of the Southern division. Subsequently he served as receiver at Denver and then as president of the successor company following the reorganization of the property.

He was a newcomer in the electric railway field when he took the post at Denver with the tramway, his previous experience having been entirely in steam railroading. Shortly after his arrival he stated that he had come to Denver to operate the tramway in such a way as best to serve the public. And that is just what he did. There were many trying experiences in connection with the conduct of the road, particularly the controversy with the city over franchise rights, but Mr. Stenger never lost sight of his announced objective. Any attempt to appraise the work of the man must take fully into account the adverse conditions under which he labored. His incumbency of the office was preceded by the period of very great increase in labor and material costs, culminating in a strike which had used up all the company's available funds. This was the heritage to which he succeeded. The prospects certainly were not rosy. Few other men would not have quailed before them, but Mr. Stenger carried through his program successfully, although his accomplishments never did approximate his dreams of what he desired the tramway to be.

When Mr. Stenger went to the tramway he had already achieved a reputation for "getting things done" as superintendent of the Southern division of the Union Pacific Railroad. At that time the office of president had been vacant since 1913, the direction of the affairs of the Denver company having been largely in the hands of Charles Boettcher, chairman of the board of directors. In addition to serving as president, Mr. Stenger performed the functions of general manager.

Like many steam railroad executives, Mr. Stenger gained much of his experience in the school of hard knocks. A civil engineer by training, he had a broad understanding of the fundamentals of the transportation industry, which not only made possible the rise to a position of responsibility with the Union Pacific, but enabled him to visualize the problems of the Denver system. He was well acquainted with the West, his entire railroad career having been passed west of the Mississippi River.

Ernest Stenger

Mr. Stenger was born in 1865 at Colmar, Alsace. Coming at an early age to the United States, he was graduated from the University of Michigan in 1886. In the same year he entered the railway service as a rodman with the Burlington & Missouri River Railroad in Nebraska. After two years of this work he was appointed a draftsman with the Atchison, Topeka & Santa Fe Railway, resigning in 1890 to become assistant engineer with the Missouri Pacific Railway.

After serving with the Missouri Pacific for ten years, Mr. Stenger resigned to join the Union Pacific System. His first position with that road was that of division engineer. He later served as assistant superintendent and as division superintendent. In 1907 he was made general superintendent of the Rio Grande Western Railway, continuing in that capacity until March, 1911. He then became general manager of the St. Joseph & Grand Island Railway, with headquarters at St. Joseph, Mo. He subsequently returned to the Union Pacific as superintendent of the Southern Division, making his headquarters at Kansas City.

During the World War he served with the American Expeditionary Forces in France as a lieutenant-colonel of the 31st Engineers. He was cited by General Pershing for efficient and capable service, and the French government conferred the Legion of Honor ribbon upon him.

Francis J. Clamer, founder of the Ajax Metal Company, Philadelphia, Pa., died recently in Collegeville. In 1868 he obtained the first practical results of anti-friction metals and raised money to start manufacturing on a large scale. Mr. Clamer was 87 years old. He was born in Hamburg, Germany, and went to Philadelphia when he was eleven years old.

Le Roy Clark, president and director of the Safety Cable Company, died on April 18 at Falmouth, Mass. He had been a prominent figure in the wire and cable industry for many years. As an electrician a year prior to his graduation from college he became connected with the predecessor of the Safety Cable Company, the Insulated Wire & Cable Company, with which he was associated during his entire business career. Later he became electrical engineer for the company and upon its reorganization in 1902 he was made vice-president. Four years later he was promoted to the presidency. Mr. Clark was a member of the American Institute of Electrical Engineers.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

General Electric Creates Engineering Council

In conformity with the action of the board of directors of the General Electric Company, an engineering council has been appointed. The council includes E. W. Rice, Jr., honorary chairman (ex officio); E. W. Allen, chairman; Elihu Thomson, A. C. Davis, W. R. Whitney, W. L. R. Emmet, C. C. Chesney and C. E. Eveleth.

The purpose of the engineering council is to advise with the vice-president in charge of engineering on the various problems that arise from time to time and as to the direction and scope of the engineering and scientific work. The council may invite other engineers to meet with it and at such times may give them the status of regular members.

Expansion by Globe Ticket Company

The Globe Ticket Company, Philadelphia, has purchased the plant and business of the Trimount Press, Inc., Boston. The plant will be enlarged and improved to manufacture, for the New England territory, all classes of tickets and checks heretofore supplied from the main factory in Philadelphia.

The Trimount Press, Inc., has been under the management of John M. Cummings for more than twenty years. Mr. Cummings becomes a director and second vice-president of the Globe Ticket Company, in charge of the new factory and office in Boston.

Recently the Globe Ticket Company established new branch offices in Cleveland and Baltimore. It has a factory and sales office in New York and a plant at Los Angeles, which is a replica of the Philadelphia factory. The Globe company is one of the oldest of its kind in this country.

Revive Plans for Mexican Interurban Lines

Plans of the Mexican Tramways for the construction of two interurban electric railways, one to run from Mexico City to Puebla, 130 miles, and the other from the capital to Pachuca, 60 miles, have been revived. It is stated that financial provision has been made for constructing the two lines and that the work will be started as soon as the surveys are finished and given formal approval by the government authorities. The route of the interurban line that is to run to Puebla will be of unusual scenic beauty as it traverses a picturesque region situated between the volcanoes of Popocatepetl and Ixtaccihuatl.

The project of constructing this road was well advanced years ago when a long period of revolution and banditry caused it to be temporarily set aside. At that time the plans included the construction of a scenic electric and cogwheel railroad up the slopes of Popocatepetl to the summit. It was intended that this road should serve also as a transportation facility for the great sulphur deposit which the crater of the volcano contains and which has been mined on a commercial scale by primitive means from time immemorial.

The Mexican Tramways is owned by Canadian interests. It operates the system of electric railways in Mexico City and the Federal District.

Transformer Prices Reduced by General Electric

General Electric Company announces a 5 per cent reduction in prices of distribution transformers and small power transformers, effective on June 1. This reduction is the sixth since 1920. On certain types of large transformers reductions which average 5 per cent for this class of product have also been made. According to J. G. Barry, vice-president, these reductions are made possible by economies resulting from improved engineering and manufacturing methods, as well as greater quantity production.

American Ideas at Economic Conference

Germany Has Adopted Our Methods, While England, France and Italy Claim They Are Not Applicable in Europe

By EDWARD J. MEHREN
Vice-President McGraw-Hill Publishing Company, Inc.

GENEVA, May 16.

A FEATURE of the International Economic Conference is the amount of attention the United States has received. We have not, through our delegates, invited it or forced it. Europe has taken the initiative. She is keenly aware of what we have accomplished industrially and to some extent she understands our mechanism. But the English, the French, the Italians and others say that our methods are not applicable in Europe; the Germans do not say so; they are applying them.

To their generalizations, the head of the American delegation, Henry M. Robinson, replied that at least European countries could adopt our waste elimination program and, abandoning their traditional industrial secrecy, freely interchange information regarding technical methods, research, trade practices, etc. He admitted that, with unemployment large, energetic substitution of machinery for hand labor might not now be possible, but he so put the point as to indicate that mechanization was fundamental to Europe's trade and industrial recovery.

A.E.R.A.

Wise Investors
Want Preferred Stock

Exhibit Space at Cleveland
Signed for Before
June 15
is a Preferred Investment.
That's Why
After Sixteen Days in the Mail
Blanks Have Been
Sent in by
151 Applicants for
69,249 Sq.Ft.
as Compared with 105 Applicants in 1926 for 50,797 Sq.Ft.
These Investors
Prefer Preferred Space
They Rather Sign Than
Be Sorry

Commenting on our much-discussed industrial efficiency, several delegates denied us perfection by pointing out—and justly, too—our prodigal waste in raw materials (now happily disappearing).

Also, the Europeans believe that in America our tastes are standardized. They contend that mass production in Europe is not possible because the Europeans are individualists and demand articles that have individuality. All in all, despite their protests, it is my belief that all the protesting delegations will go home more determined than ever that, as rapidly as they can carry out the education of owners, managers and workers, American methods will be applied. Also, this thought should not be slurred over—that perhaps the expressed attitude toward American methods is political. For example, with the large unemployment in Great Britain, how could the British delegates go home and admit that they had urged mass production and the rapid mechanization of industry?

AMERICA'S FOREIGN TRADE

Commenting on the extent of American investments in Europe in recent years, W. T. Layton, editor of the *Economist*, London, asked the American delegation whether America would continue to lend freely but would not buy from Europe. He asked also whether a new equilibrium could be established in which America would buy the natural products of tropical countries on a scale large enough to enable her creditor position to be liquidated by a system of triangular trade.

Replying to Mr. Layton, Mr. Robinson pointed out that our imports of manufactured goods, which come mostly from Europe, have doubled from 1913 to 1926. Europe's own figures of her exports to the United States in 1925 from the five principal countries, Great Britain, Germany, France, Italy and Belgium, show an increase of 76 per cent, while her exports to the rest of the world had increased 24 per cent. In addition American tourists had spent $650,000,000 in Europe last year.

AMERICA BIGGEST BUYER

As to triangular trade, Mr. Robinson revealed that ten countries outside of Europe, where European capital is largely invested, and there is virtually no American capital, had sold to the United States in 1925 goods to the increased value of 362 per cent as against 1913, while other countries had increased their purchases by only 87 per cent. The United States buys from Brazil three times as much in value as Brazil buys from the United States, but Brazil buys three and three-quarters times as much from a "single European country" as that country buys from Brazil.

Another point that interests Americans—and surprises them—is the apparent deprecation by Europeans of the possibilities of the home market. Constantly, they harp on America's huge "homogeneous" home market. True, we have a population of 120,000,000, but not so highly homogeneous as the Europeans imagine. But Great Britain has about 43,000,000, France, 40,000,000 and Germany 60,000,000, surely markets not to be sneezed at. Moreover, one needs to remember that the American market is pretty well supplied; our standards of living are very high compared with those of Europe. Think, then, of the market afforded by the opportunity to raise European standards to a point somewhat nearer the American.

Also outstanding is a matter of omission rather than of commission—namely, the relative neglect of the need for securing economy in distribution. True, several speakers made passing reference to it, but the only vigorous declaration came from Frau Emmi Freundlich of the Austrian delegation. Of course, the conference's committee on agriculture appreciates the economics of distribution and is giving it a lot of attention.

Details of Baltimore Car Equipment Orders

The United Railways & Electric Company, Baltimore, purchased the following new equipment for existing cars:

276 G.E. 275-F 60-hp. motors, supplied with G.E. grade M spur gearing 15:71. These motors were used in quadruple equipments for trailer pulling service, replacing older motors.

40 Westinghouse 306-CV-4 65-hp. motors, supplied with Nuttall grade BP spur gearing 14:60. These motors were also used in quadruple equipments for pulling trailers, replacing older motors.

69 car sets of G.E. auxiliary contactors, including DB 986 line breakers, No. 1518-A1 relays and LB-2 controller handles.

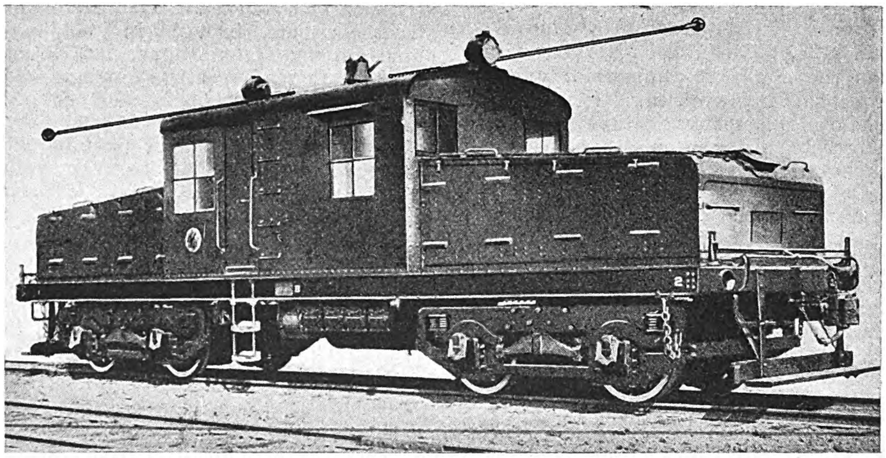
Ten car sets of Westinghouse 806-J-4 line breakers.

40 car sets of rheostatic electric car heating units. These units were of special design, patented by the Baltimore company and utilizing General Electric industrial heating elements.

250 car sets of G.E. three-cell aluminum lightning arresters.

At the present time the company is making plans to equip ten additional cars for train service, which will involve the purchase of twenty Tomlinson car and air couplers with five-point electrical couplers and other miscellaneous door contact and communicating signal equipment.

North Shore Orders Two Trolley Storage-Battery Engines



Orders for two electric trolley storage-battery locomotives have been placed by the Chicago, North Shore & Milwaukee Railroad—the North Shore Line. They are to be used in supplying freight service to the various industrial plants along the road.

The locomotives, each weighing 65 tons, will operate either from an overhead trolley or from the storage batteries, which can be charged from the trolley while the locomotives are operating. This flexibility of operation will enable the railroad to switch cars into industrial plants equipped with tracks but without trolley connections. The complete absence of smoke, noise or noxious gases of any kind will permit the locomotives to run into buildings where a steam locomotive would be very objectionable. Each unit is equipped with four motors of 205 hp. and a battery of 192 cells, rated 600 amp.-hr., capable of delivering 260 kw.-hr. on one charge.

Operating on the battery alone one locomotive will be capable of hauling 33 loaded freight cars a distance of 5¼ miles at a speed of 12 m.p.h. on one charge. With a light load the locomotive will run on the battery at a speed of 20 m.p.h.

The locomotives are being built by the General Electric Company to order from specifications drawn up by engineers of the North Shore Line, and the General Electric Company has promised delivery in about three months. They will be used largely on the new Skokie Valley route of the North Shore Line, where many industrial plants are being located.

Electric Railroad Locomotive Shipments for April

April shipments of electric railroad locomotives from principal manufacturing plants, based on reports received by the Department of Commerce, totaled 23 locomotives, as compared with 11 in March and 28 in April, 1926. The accompanying table gives the shipments and unfilled orders of locomotives for each month since January, 1926.

RAILROAD LOCOMOTIVES

	Shipments			—Unfilled Orders, End of Month—		
Year and Month	Domestic Electric	Foreign Electric	Total	Domestic Electric	Foreign Electric	Total
1926						
January	11	2	13	53	42	95
February	22	2	24	60	40	100
March	11	1	12	50	41	91
April	12	16	28	44	29	73
Total (four months)	56	21	77	..	..	..
May	14	9	23	46	23	69
June	11	3	14	53	20	73
July	20	..	20	36	23	59
August	16	7	23	26	16	32
September	13	7	20	24	11	35
October	15	..	15	20	13	33
November	15	1	16	27	15	42
December	17	11	28	14	8	32
Total (year)	177	59	236	...	...	...
1927						
January	8	2	10	16	6	22
February	10	1	11	22	9	31
March	11	..	11	48	9	57
April	23	..	23	35	10	45
Total (four months)	52	3	55	...	...	...

A $126,662 Scrap Pile in Toronto

Scrap materials were sold by the Toronto Transportation Commission for $126,662 in 1926. Nothing which has the slightest commercial value is wasted or thrown away. For example, lead foil from electric tape and wrappings, etc., brought more than $500. All burnt-out and broken electric light bulbs are saved, and the butt, being constructed of brass, is salable. These butts last year sold for more than $40.

Babbitt metal for axle bearings, when worn down, is melted and used again. There is, however, a form of slag which lies on top and cannot be used in a good bearing. This is sold as scrap, and last year more than $480 was received from this waste metal.

Aluminum cuttings from the construction of coach bodies, stanchions of street cars, etc., brought in $141, machine cuttings from copper and brass articles manufactured in the shops sold for $1,369, scrap brass and copper parts sold for more than $11,000.

The balance and larger part of the $126,000 is made up of scrap rail, wheels, lead, etc., from dismantled batteries, malleable and cast iron, pipes, steel, rubber and old plush cushions.

All scrap metal is collected from various sections and turned into the Hillcrest stores, where it is sorted. Different kinds of metal are placed in individual bins and sold separately, as much better prices are thereby obtained.

Copper Climbs Close to 12¾ Cents

A DISTINCTLY better feeling existed in the non-ferrous metal markets June 1 than prevailed a week ago, reports *Engineering and Mining Journal*. Copper, which sagged to 12½ cents delivered in the East, has recovered sharply, and on a good volume of business approached 12¾ cents June 1, one or two sales at 12⅝ making it impossible to quote the even quarter. Zinc, likewise, has advanced from 6 cents to 6.10 cents during the week, though the market has not been active. Lead is down ten points from a week ago, but business has picked up, and the tone of the market seems good. Tin was bought in fair quantity on one or two days, and prices are somewhat firmer. Antimony, on the other hand, is easier, and the market is lethargic. Platinum continues exceptionally dull, with prices, largely nominal, somewhat lower than last week.

Only about 10,000 tons of copper changed hands at 12.50 cents on the latest movement. This includes sales at the low figure on Wednesday, Thursday, and Friday of last week. On each day there was sufficient business at 12⅝ cents in the East and 12¾ cents in the West to keep the quotation above 12½. On Friday most of the 12.50 cent metal had disappeared and 12⅝ cents represented the bulk of the sales. On Saturday and Tuesday, Monday being a holiday, business continued good at 12⅝ cents.

Last Thursday lead prices declined a further ten points, in both the New York and the St. Louis markets, following a 5s. decline in London. On that day, May 26, the American Smelting & Refining Company reduced its contract price from 6.50 to 6.40 cents, New York, and sellers in the Middle West came down from 6.15 cents, St. Louis, to 6.05 cents. Business on the whole has been somewhat better; Monday's holiday of course cut into the total, but inquiries June 1 were improved. Battery and cable makers continue to be only small factors in the market.

The tin market ruled very quiet until May 31, when there was a scramble among dealers and prices for all positions were marked up quite a bit during the day. The advance in London June 1 was much less than expected, but the New York market continued strong, and prices were again higher. Tin for delivery three months hence has averaged about 3 cents per lb. below the price of prompt Straits, early deliveries continuing exceedingly scarce. Prompt Straits in New York June 1 sold at 67½ cents, which is ¼ cent below a week ago, but ½ cent above the low during the week.

For the time being at least the zinc market has turned upward from the 6 cent level reached May 26. Output from the Joplin mines has shown progressive decline to about 10,000 tons of zinc concentrate per week. Although only 6,000 tons was sold last week, it is believed that the reason was the disinclination of sellers to accept $38 rather than the lack of demand on the part of smelters.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 1, 1927
Copper, electrolytic, cents per lb	12.50
Copper wire, cents per lb	15.125
Lead, cents per lb	6.40
Zinc, cents per lb	6.45
Tin, Straits, cents per lb	67.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.50
Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.70
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.62

Rolling Stock

New York Central Railroad, New York City, has ordered fifteen gasoline-electric motor cars for delivery within six months. Two of the cars will operate on the Fort Wayne-Jackson branch of the Lansing division. They will replace steam trains. Each unit will be 73 ft. long.

Detroit, Monroe & Toledo Short Line Railway, Detroit, Mich., is equipping its rolling stock with individual automobile seats. Cars on other long runs will be similarly equipped, it has been announced by A. L. Drum, receiver for the properties.

Trade Notes

Graham Brothers Corporation, New York City, announces the formation of a financial organization to operate in the industrial field. Offices have been opened at 1 East 44th Street, New York City.

L. H. Gilmer Company, Tacony, Philadelphia, Pa., through its board of directors, has elected Frank B. Supplee treasurer of the company. Mr. Supplee has been with the company for twelve years, working up from a minor position.

Electric Controller & Manufacturing Company, Cleveland, Ohio, announces the appointment of the firm of J. B. McCarthy & W. P. Robinson as representatives in Canada. The offices are at 307 Reford Building, Toronto, Canada, and 808 Drummond Building, Montreal, Que., Canada. The appointment of the Petroleum Electric Company, 217 East Archer Street, Tulsa, Okla., as representative in Oklahoma and the Panhandle District of Texas also is announced.

Lincoln Electric Company, Cleveland, Ohio, announces the appointment of the Wade Engineering Company, 1855 Industrial Street, Los Angeles, Cal., as distributor of Lincoln products in California. The company maintains a branch at 69 Webster Street, Oakland, Cal., both main office and branch carrying stock of Lincoln "Linc-Weld" motors and "Stable-Arc" welders, as well as service parts. The Los Angeles branch is in charge of Henry N. Wade, who is also president of the company. Mr. Wade is a graduate of Cornell University. H. T. Lintott, also an experienced electrical engineer, has charge of the Oakland branch.

Griffin Wheel Company, Chicago, Ill., has elected A. A. Hale vice-president. He is the Eastern sales manager.

ASTUTE ENERGETIC RATIONAL ADVERTISING
Have you sent in your application for exhibit space
at Cleveland, Oct. 3-7 ?

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 11, 1927 *Number* 24

The Bigger the "If" on the Clubhouse Door the Lower the Score

WITHOUT confidence in one's own team, victory is impossible. And in business, just as in sport, confidence and enthusiasm are essential to success. A question mark in the manager's mind is soon reflected throughout the organization.

"What is the most important need of the electric railway industry?" some one asks. Above all else it seems to be confidence in the possibilities of his own industry on the part of the railway executive.

Is such confidence justified or is the industry merely whistling to keep up its spirit? The answer is simple. The arteries of transportation are the very life streams of the community. Property values are built on transportation. The value of a piece of property for business purposes depends on the number of people who pass it daily. Those people are brought there by the community's transportation system. The transportation is not only necessary, it is vital.

Then what, if anything, is the matter with the transportation industry? Public misunderstanding? Yes. Lack of co-operation by public officials? Yes. But these conditions exist only in some cities. In many others they did exist but have been eliminated. In few instances did the public or its representatives take the initiative. It is not to be expected that they will. That is the responsibility of the railway executive. In some cases a radical change in his own point of view is necessary before real progress can be made.

Whatever the Vehicle, the Principle Remains the Same

MEN who go down to the sea in ships are rightly supposed to be a shrewd and sagacious clan. Experience has taught them to be sure whither a new course, be it one of adventurous sailing or of a change in management policy, leads before they embark on it. Hence the present widely adopted policy of replacing old ships by new ones has a significance extending far beyond the shipping industry itself.

Today the world has about 30 per cent more ships than in 1913, while the volume of world trade is estimated at about 20 per cent less than it was before the war. Yet shipbuilding continues at a good rate. This is explained by the superior efficiency and attractiveness of the new ships. It has been found that they pay for themselves.

While differences are numerous between transportation by water and transportation by rail, the principle of increasing revenue by improving equipment is the same. Today there are probably enough electric railway cars available to carry the present traffic, but many of them are woefully out of date. They are costly to operate and are poor business getters. Progressive railway men, like the shrewd ship owners, have discovered it pays to replace obsolete equipment with the best that modern science can supply. This cannot be done in a day, or a week, or a month, but the movement in this direction is steadily gaining momentum.

Study the Human Element If You Would Build for Permanency!

OWEN D. YOUNG, chairman of the board of the General Electric Company, has the rare gift of specific expression in that he saves his hearers the effort required to translate words into thought. That is the principal reason why the speech made by him on June 4, at the dedication of the new building of the Harvard Graduate School of Business Administration, has attracted so much attention. He repeated some of the things he had said before about the need for a cultural wage, but he said some other significant things which reflect the attitude of big business toward the problems before it, and show the methods used by big business in rising to meet its opportunities.

Advantage can be taken of these opportunities only as the oldest of the arts and the newest of the professions thinks in terms of human beings. It certainly is true that the area of conflict between capital and labor is gradually being reduced. Many things are being learned, and not the least important among them is that low wages for labor do not necessarily mean high profits for capital. Time and brawn alone are not factors by which the barometer of productivity can be forecast. As Mr. Young made plain, the problem today is to deal with the limits within which men may work with zest and spirit and pride of accomplishment. When zest departs, labor becomes drudgery. When exhaustion enters, labor becomes slavery.

However complete the scheme of management may be which takes these things into account, it still fails of its purpose if it does not contemplate that the employee shall share in management through participation by him in ownership. Only in that way is it to be expected that the employee will use capital truly as a tool and be interested in turning it to the highest economic advantage. The hope expressed by Mr. Young was that the day may come when the great business organizations will truly belong to the men who are giving their lives and their efforts to them, no matter in what capacity.

Some of these things sound sensational only because not all of us are as yet attuned to the ideas of the new morality in business which has for its goal that we shall dispose, once for all, of the charge that in industry organizations are autocratic and not democratic. All this is unusually significant. It is not idealism run rampant. The promulgation of the doctrine comes from a man who as the head of one of the greatest business organizations in the world has witnessed the favorable results that have followed the application of the policies he preaches.

The spread of education, with its intensification of inquisitiveness and sensitiveness, has raised men to a higher ethical plane and increased their ability to appraise things properly in the light of their long-time value, while, as has been made plain before, new discovery in pure science, every enlargement of the industrial horizon, every new material put into the hands of humanity, has renewed the demand for the highest type of business management.

The ultimate object mentioned by Mr. Young, that we shall have no hired men, is a long way off, but the time is rapidly coming when ability merely to be shrewd, if it really is ability, will no longer be the *sine qua non* of success. The demands of the times for executive talent transcend any such narrow confines. This the dedication of the new building at Harvard proves. It is important to create a business heritage, but it is much more important so to build in creating it that its perpetuity may be assured. And perpetuity can be reasonably assured only as business carries on along the far-sighted lines Mr. Young has outlined—lines that contemplate the building of men with a stake in the enterprise fitted to assume greater and ever greater responsibilities.

Encouraging News on Taxes

ENCOURAGING news has come from within the classic walls of the treasury building in Washington. As the fiscal year draws to a close, we are informed that there is certainty of another large treasury surplus and of a substantial reduction in the amount of public debt. This is considered as indicative of a further tax reduction by the next Congress.

Internal revenue collections for the first ten months of the fiscal year were about $13,500,000 larger than the amounted collected a year ago, an increase of $228,200,000 in income tax collections having been nearly offset by a decline in receipts from miscellaneous taxes. "On the first of these figures," says the *Guaranty Trust Survey* of New York, "it is estimated by Treasury officials that the surplus for the twelve months will exceed $500,000,000. The actual surplus for the year ended June 30, 1926, was $377,000,000."

It is universally accepted that the only two certain things in this life are death and taxes, likewise that relief from the latter is always a matter of conjecture. Conjecture in this case is encouraging and centers around the probable reduction in the income tax on corporations. This tax, which was increased in the last revenue law, has been criticised very freely by business men and on account of lack of harmony with the general principles of income taxation. In addition, automobile and other excise taxes are likewise unpopular and may be reduced or repealed.

In the *Survey's* general prediction is included the statement that "there appears to be a growing sentiment throughout the country in favor of drastic reform in state and local expenditure." As the JOURNAL has pointed out from time to time the necessity for some relief from the present loose policy in public expenditures, it is indeed heartening to hear that the American taxpayer is at last alive to the seriousness of the situation. No corporations have suffered more from taxes than those which have the great task of transporting millions of the country's workers to and from work, to say nothing of providing the public with a cheap and efficient means of recreation—all of which has been done with this great financial millstone retarding their progress. Consistent effort, then, should be employed to make the anti-public expenditure sentiment grow. It is a plain case of self-preservation.

One-Man Car Operation Has Had Remarkable Growth

INCREASE in the number of one-man cars in operation today over the number operated a few years ago is one of the striking changes that have occurred recently in the electric railway industry. According to the JOURNAL'S latest figures there are about 750 electric railways with 80,000 passenger cars in the United States. Of this number some 20,000 cars, or approximately 25 per cent, are arranged for one-man operation. In the total number of electric railway passenger cars, however, is included a considerable amount of rapid transit equipment, trail cars and rolling stock not in daily use. The one-man cars therefore represent a somewhat larger part—possibly as much as 40 per cent—of the number of ordinary street and interurban cars in regular service.

Proportionately more one-man cars are operated in cities of less than 500,000 population than in the twelve cities in this country that are credited by the 1920 census with a population above that figure. In these twelve largest cities there are only about 4,000 one-man cars and nearly 20,000 two-man cars. Most of the former are operated in outlying sections or at night and on Sundays. Often they are operated by two men on heavy traffic routes during the day. San Francisco is the only city in this group where no one-man cars are in service. It is noteworthy, however, that the proportion of one-man cars is much greater in some of these large cities than in others, and it does not appear that the mere size of the city is a serious obstacle to one-man operation.

In Newark, N. J., a city of more than 400,000 people, all cars are one-man operated. This is true also in Jersey City, N. J.; Worcester, Mass.; Springfield, Mass; Paterson, N. J., and Camden, N. J., cities having between 100,000 and 300,000 population. The Eastern Massachusetts Street Railway, which is second only to the Public Service Railway of New Jersey in the number of one-man cars operated, serves four cities of more than 100,000 population, as well as many smaller communities. Neither of these companies operates any two-man cars. Numerous other railways are also on a 100 per cent one-man basis.

Because of the necessity in the South of separating white and negro passengers, the one-man car came into use more slowly there than in other sections of the country. Nevertheless it has been adopted to a considerable extent by the railways in Atlanta, Birmingham, Memphis, Richmond, Savannah, a number of Texas cities and elsewhere. Indications are that its use will become more general there as time goes on.

Substantial economies are obtained as a result of one-man operation. With wages around 50 to 60 cents per hour, and an average of 10 m.p.h., the saving approximates 5 cents per car-hour despite certain small additional expenses. Experience has shown that the accident hazard with one-man cars is no greater than with two-man cars. Schedule speed remains about the same. Well-designed one-man cars have proved popular with the riding public in many communities. Thus there is every prospect that the remarkable growth of the past few years will continue for some time to come.

Great Inland Empire System Under Trunk Line Auspices

SPOKANE, the center of the so-called Inland Empire System, was always proud of that property, which has recently passed to ownership by the Great Northern Railroad. It might be asked, of course, how, under these circumstances, it came about that the system was permitted to fall upon evil days. That is not quite so easy to answer, except in so far as the changed economic status of the property with the coming of the private automobile affords an answer.

The property was typical of the West. It was conceived liberally and carried to fruition the same way. For a long while it was moderately successful, but the price that was paid by the old owners was not one that could have been foreseen by even the most astute. That, however, is neither here nor there. Now the lines pass to one of the great trunk systems, destined no doubt for a career that the original promoters never dreamed. The Great Northern will, of course, tie in the lines with the rest of its system and so increase the usefulness of this 170-mile system. That the lines are in some sense strategic in the Great Northern scheme of things is beside the point. Their identity may eventually be lost in the larger significance of the Great Northern, but the fact remains that the original promoters of the line were men of vision who did more for the upbuilding of the communities that the road served than they ever did for themselves.

In the impending loss of their individual identity by the lines of the Inland Empire System there is more than a meed of satisfaction that their purchase and use by the Great Northern as electric feeders are in keeping with the general program of electrification of the company in the Pacific Northwest.

Posters on Poles Are Unsightly and Dangerous

PLACING advertising posters or placards on electric railway poles in the public streets is an objectionable and dangerous practice, difficult for the companies to stamp out. Where tubular steel, fabricated or reinforced concrete poles are used, less annoyance of this kind is experienced. Usually the advertiser finds it too much trouble to attach his placard to one of these poles. But many wood poles are still in use in city streets and along interurban lines. No ingenuity, and comparatively little effort, is required to place a placard on a wood pole. Some tacks and a few blows of the hammer are sufficient. Hence the habit of defacing poles in this way is widely prevalent.

From the railway standpoint this practice is doubly objectionable. It mars the appearance of the company's equipment, and creates a certain hazard to the men who are obliged to climb the poles in the course of their duties. The tacks used to fasten advertising material to the pole are likely to prevent the lineman's spurs from taking hold, thus causing him to slip and fall to the ground. Several accidents of this kind have been reported recently.

In some states the use of poles for this purpose is forbidden by law. Even where this is not done, the advertiser has no right to place placards on railway property without the consent of the company. The best way to combat the practice is to have all railway employees keep their eyes open for posters on poles, and to inform the management whenever any are found. The company can then have them removed and notify the advertiser to discontinue the practice, or appropriate legal action may be taken if required.

Will Traffic Congestion Force More Organized Street Use?

TRAFFIC congestion is a community problem as serious as any with which the modern city has to contend. All measures so far devised have failed to show the way toward permanent relief. Even the enormous expenditures for street widening which have been made in many cities have proved inadequate in the face of the constantly growing demand for street space.

Fundamentally, every individual in a community has a right to the free use of the streets. This right exists, however, only as long as its exercise by one individual does not interfere with the rights of others. When the free exercise of individual rights causes general inconvenience, danger and loss, then the needs of the community take precedence over individual right.

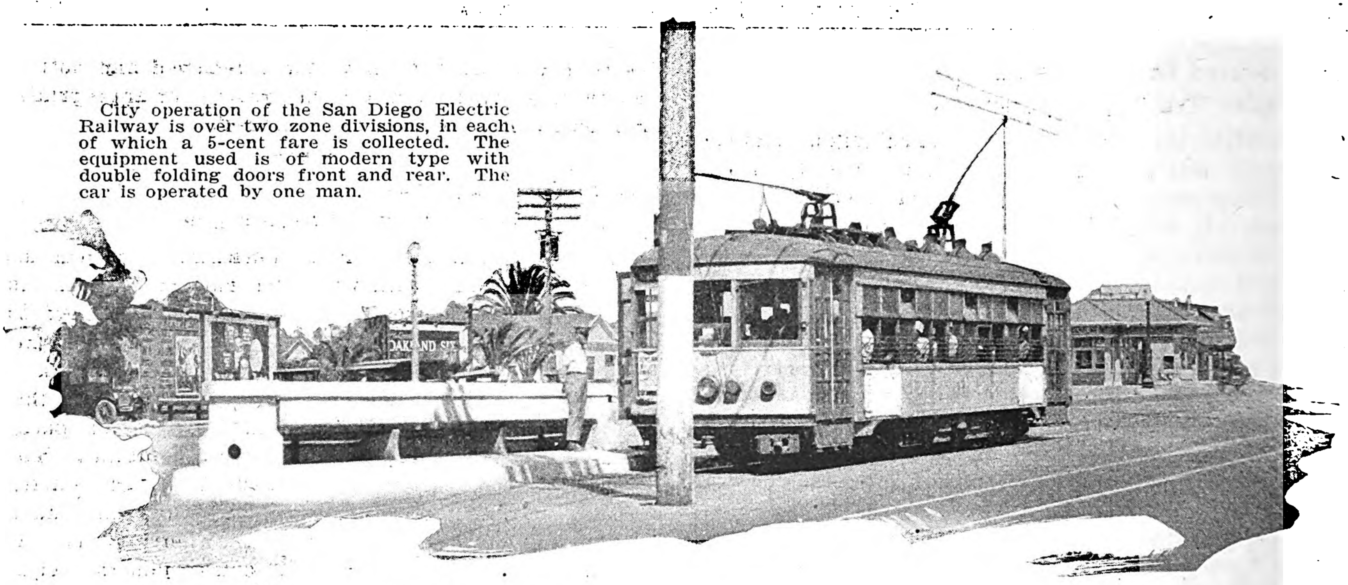
Relief of congestion is in a large sense a social problem. Social changes take place very slowly, particularly when they involve curtailment of the individual's rights. Progress is possible only after public opinion has been aroused to appreciation of the need for action. This will come in time. Public opinion is being aroused rapidly to the evils of parking in congested streets. It is recognized that the necessity of the many must take precedence over the convenience of the few.

Restriction, or elimination of parking, however, is not the whole solution for congestion. True, it cuts down the use of individual transportation, and in that respect helps the community and the public transportation companies. But the ownership of individual cars is widespread. They cannot all be classed as a luxury. In some cases they are a distinct convenience—even a necessity—when congestion does not largely restrict their usefulness. Due consideration must be given to this phase of the question if relief from congestion is to be obtained on a fair and equitable basis.

Regulation of traffic movement has nearly reached the limit of its possibilities in some cities. The next logical step seems to be organization. The period of maximum utilization extends over only a relatively small part of the 24 hours. During those periods public transportation, individual transportation and commodity movements are all at their peak. Even this does not adequately describe the situation. Vehicles move hither and yon, crossing, overlapping, some empty and some full. Thus, despite the limited street facilities, there is enormous waste in their use.

A railroad is in a sense comparable to a highway or a city street. It is an artery for the movement of passengers and commodities. If the rail line were operated in the wasteful way which characterizes our streets its capacity would be enormously reduced. The difference in usage today is the difference between organized use and unrestricted individual use.

Then, also, there is the freight vehicle which uses the streets and which is essential to the welfare of the community. Adequate recognition must be given to the movement of commodities in any scheme of congestion relief. To make this relief permanent and equitable, each factor in transportation must be given consideration in proportion to its importance to the community. Only when the problem is approached from this angle will the interests of the community be served best.

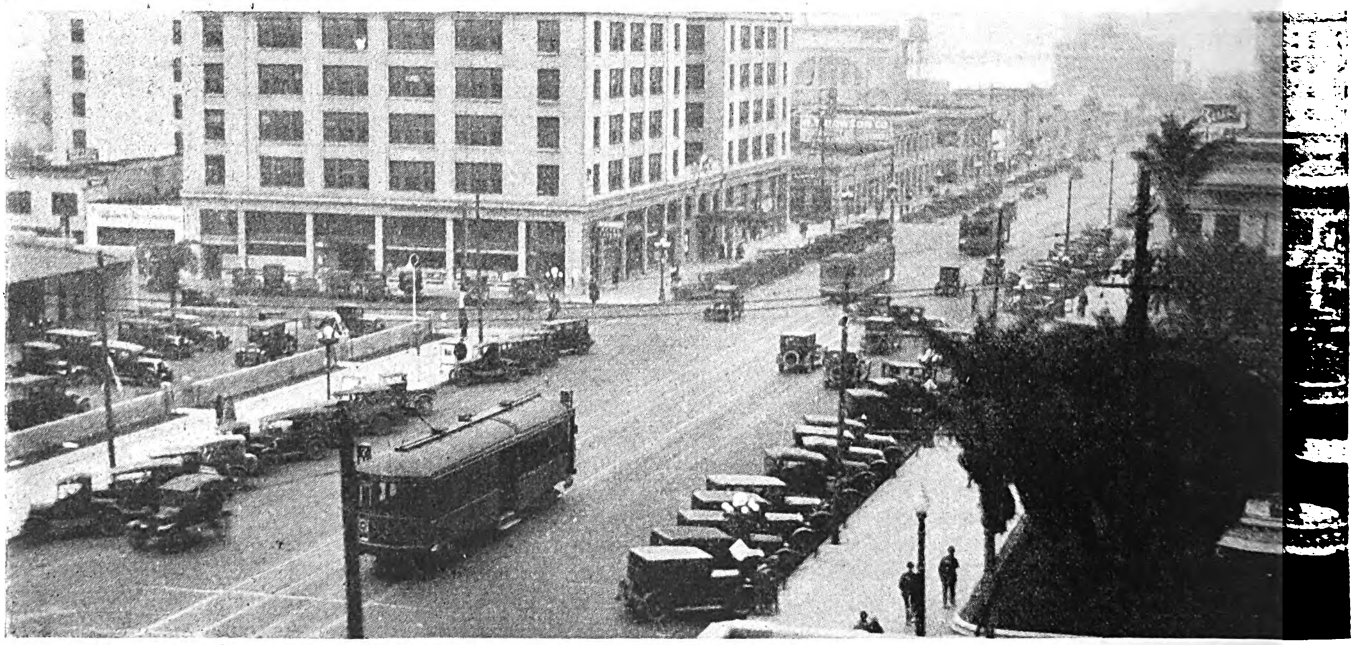


City operation of the San Diego Electric Railway is over two zone divisions, in each of which a 5-cent fare is collected. The equipment used is of modern type with double folding doors front and rear. The car is operated by one man.

Zone System Builds Revenue in San Diego

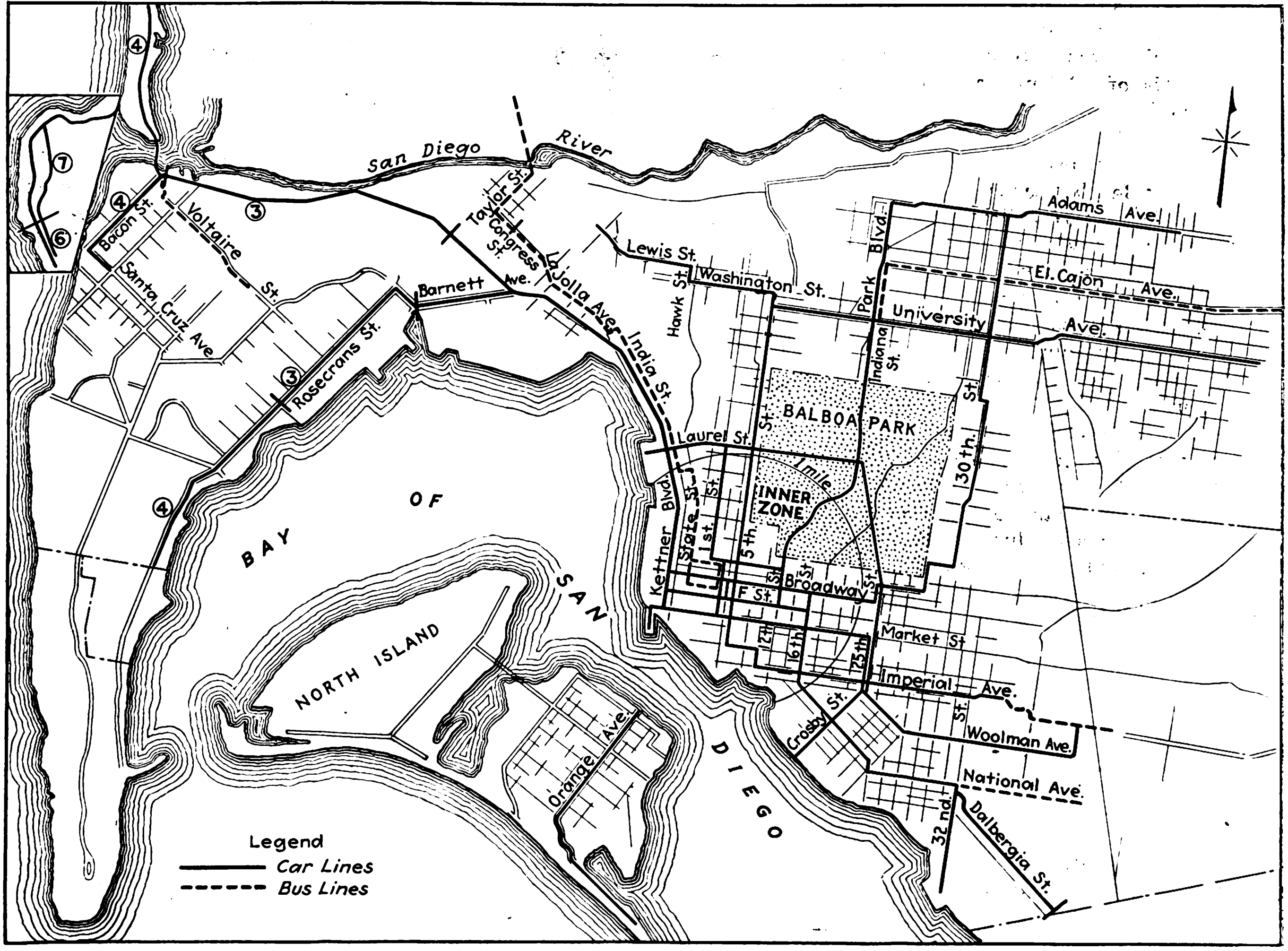
City division includes two zones each with 5-cent fare. Commission of 3 per cent gross sales of tokens, passes and special forms of transportation paid to operators

SUCCESS of the zone system of fares and the weekly pass in San Diego, Cal., is attributable, according to the management of the San Diego Electric Railway, to the co-operation of the platform men in perfecting this somewhat complicated fare-collecting arrangement. An incentive, in the form of a commission or bonus paid each year to those of the operating staff who make an effort to sell the service of the company as indicated by the sale of additional passes and tokens, maintains the enthusiasm of the men for the system. The commission amounts to 3 per cent of the total sale of passes, tokens and special forms of transportation sold by the platform men. It is divided on the basis of total hours worked during the year by each man. This results in increased compensation to those who make the effort to sell the product of the company, namely, transportation. Such sales facilitate the problem of fare collection. For with passes, the zone system of fares is simplified, as the pass may be presented in lieu of a fare, thus reducing the work on the part of the trainmen. Similarly, with tokens, the work of the trainmen is materially lightened and the time required for the interchange of passengers is reduced as it minimizes the amount of change making.



In the main section of the city a 5-cent fare is collected from the short rider. The weekly pass of $1, however, entitles the passenger to ride in both zones of the city division

Two divisions are operated by the company, one the city division and the other the interurban division. The latter includes the suburban and intercity lines to La Jolla and National City. The city division, covering all city lines, is divided into two zones. The inner zone limit is just outside a circle with a 1-mile radius from Fifth and Broadway, the main downtown loading and diverting point. Hence the maximum ride in the inner zone is approximately 1.15 miles and the transfer ride from one side of the city to the other within the inner zone is approximately 2.25 miles. The outer zone extends from the inner zone limits to the ends of the various lines, a distance varying from 1.82 miles to 5.20 miles. Three heavy transfer points are located in the outer zone.


San Diego River
Taylor St.
Congress St.
La Jolla Ave.
India St.
Lewis St.
Washington St.
Hawk St.
Park Blvd.
Adams Ave.
El Cajon Ave.
University Ave.
Indiana St.
Bacon St.
Voltaire St.
Santa Cruz Ave
Barnett Ave.
Rosecrans St.
BALBOA PARK
30th St.
Laurel St.
1 mile
INNER ZONE
Kettner Blvd.
State St.
1st St.
5th St.
9th St.
Broadway
F St.
12th
16th
25th
Market St.
Imperial Ave.
Crosby St.
Woolman Ave.
National Ave.
32nd St.
Dalbergia St.
BAY OF SAN DIEGO
NORTH ISLAND
Orange Ave.
①
③
④
⑥
⑦
Legend
Car Lines
Bus Lines

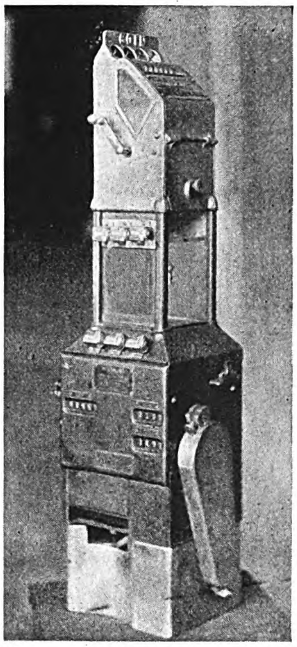
Map of the San Diego Electric Railway system showing the extent of the inner and outer zones

The inner zone is within a radius of approximately 1 mile from Fifth and Broadway, the heart of the business district. The outer zone extends from the limits of the inner zone to the ends of the city lines. The interurban systems are divided into 5-cent fare zones, the longest line—that which runs to La Jolla—having seven zones.

Fares on the city division are 5 cents cash in either zone and 10 cents cash for a single ride through both zones. Four metal tokens are sold for 30 cents, which makes the fare through two zones 7½ cents a ride. Weekly passes for both zones are $1. All city lines terminate downtown within the inner zone, as it would be impracticable for a line to operate from the outer zone, through the inner zone and out into the outer zone again, which would greatly complicate the handling of fares. Fares are collected once per trip, pay-as-you-enter inbound and pay-as-you-leave outbound. Because 80 per cent of the operation is with one-man cars, no attempt is made to identify or hat-check inbound passengers. However, the great majority of the travel is between homes in the outer zone and the downtown district. In addition 30 per cent of the number of fares are paid with the weekly pass. Outer zone riders are only a small percentage of the total. It is left to the operator to remember what 5-cent fares are collected in the outer zone and at the zone limit request additional fares. Hence, on inbound trips as passengers board the cars in the outer zone, they display a weekly pass, pay tokens, 10-cent cash fares, or 5-cent outer zone fares and are issued transfers, if requested. In the inner zone the passenger boarding displays his pass, pays 5 cents cash inner zone fare, 10 cents cash or token and, if the latter, is issued a transfer.

On outbound trips at downtown loading points all doors are opened. This practice facilitates the loading of passengers and a quick get-away. The fares are collected on the pay-as-you-leave plan, the operator handling a few at each stop, similar to the pick-ups on inbound trips. The passenger leaving the car in the inner zone pays 5 cents cash fare, inner zone transfer or displays a pass. Those riding into the outer zone pay the 10-cent fares or tokens or display passes. To the few who board the cars after leaving the inner zone an identification check is issued, which is returned to the operator with the outer zone fare as the passenger leaves the car.

Johnson fare boxes are used on all cars and for



Air-operated fare box used at San Diego

Use is made of the Johnson fare box for collecting all cash fares. However, to designate the 10-cent cash fares from the 5-cent cash fares a Veeder counter is mounted on the side of the box. Another counter is used for recording weekly passes and a third is used for recording school passes. Fare boxes on the interurban cars have additional counters for recording the various zone cash fares collected. This box is air operated.

statistical purposes have attached to one side three small Veeder counters, one for recording the number of 10-cent fares deposited, another for recording weekly passes and another for recording school passes.

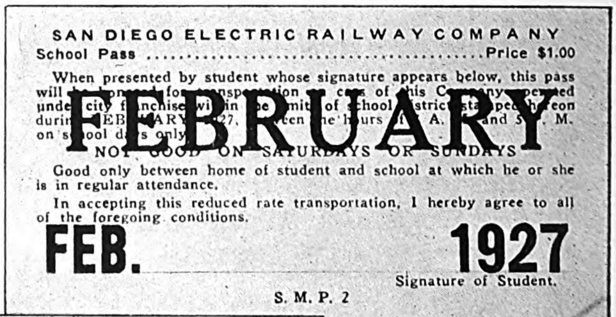
The interurban divisions are likewise divided into zones. On the National City line an additional zone to the two city zones is included. This line is covered by a $1.25 weekly pass or a 15-cent cash fare. On these cars an additional Veeder counter is mounted on the farebox for tallying the 15-cent cash fares deposited in the box. The records of 10-cent and 15-cent cash fares enable the auditing department to compute the number of passengers carried from the cash turned in. The Ocean Beach and Mission Beach interurban line has four zones, while the La Jolla line has seven. On these lines, however, the fare collection is handled on the pay-within plan. The fares are collected by various forms of car tickets, weekly passes, duplex tickets and with cash fare receipts.

Interurban weekly passes, of which there are several covering the four branches of the system, are sold by operators on cars of the respective lines. All passes, both city and interurban, are sold at the ticket office. As more than 90 per cent of the city passes are sold during the first inbound trip Monday morning operators are kept busy during the trip. The dollar sale of the pass, however, is made with no more trouble than collecting a cash fare, and the necessity for further change, transfer and identification checks is eliminated for the whole week. The only additional work consists of recording the pass rides on the Veeder counter when the pass is presented.

Increased riding and revenue have resulted from the sales methods employed. Revenue has shown a consistent gain for the past two years of approximately 5 per cent. This is attributed by the company to the popularizing of street car riding in San Diego by the zone fare system and the weekly pass. For the week of Jan. 10 to 16, which was an ordinary week, 7,831 passes were sold at $8,221.75, which provided 201,064 pass rides. While the pass revenue is not entirely satisfactory on account of the low rate per ride, it is kept in mind that passes are recorded each time they are presented, even though the passenger transfers twice during a single trip. Many of the pass rides are for a few blocks for convenience and the company is satisfied that the additional rides above the two peak rides each day are during the time when there is plenty of room to handle this additional patronage without additional expense.

As a result of the simplification of fare collection through the use of the weekly pass and tokens the company has been able to extend its one-man operation. Modifications have been made in the equipment to allow for this. The center-entrance type of car has been rebuilt to permit of one-man operation. End doors of the double folding type have been built in, the depressed center section raised and the side panels extended straight through at the point where the center doors were located. This work of modernizing the equipment has been going on in the shops of the company for approximately two years.

Almost all of the equipment is now



SAN DIEGO ELECTRIC RAILWAY COMPANY

School Pass .... Price $1.00

When presented by student whose signature appears below, this pass will [illegible] for transportation [illegible] cars of this Company operated under city franchise within the limits of school district stamped hereon during FEBRUARY, 1927, between the hours of [illegible] A. M. and [illegible] P. M. on school days only.

NOT GOOD ON SATURDAYS OR SUNDAYS

Good only between home of student and school at which he or she is in regular attendance.

In accepting this reduced rate transportation, I hereby agree to all of the foregoing conditions.

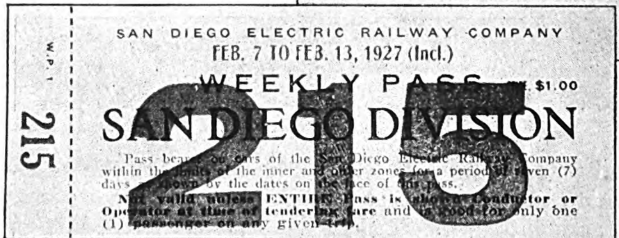
FEBRUARY

FEB. 1927

Signature of Student.

S. M. P. 2

S. E. MASON,
General Manager.



W. P. 1 215

SAN DIEGO ELECTRIC RAILWAY COMPANY

FEB. 7 TO FEB. 13, 1927 (Incl.)

WEEKLY PASS [illegible] $1.00

SAN DIEGO DIVISION

215

Pass bearer on cars of the San Diego Electric Railway Company within the limits of the inner and outer zones for a period of seven (7) days as shown by the dates on the face of this pass.

Not valid unless ENTIRE Pass is shown Conductor or Operator at time of tendering fare and is good for only one (1) passenger on any given trip.

S. Mason
GEN. MANAGER

W. P. 1

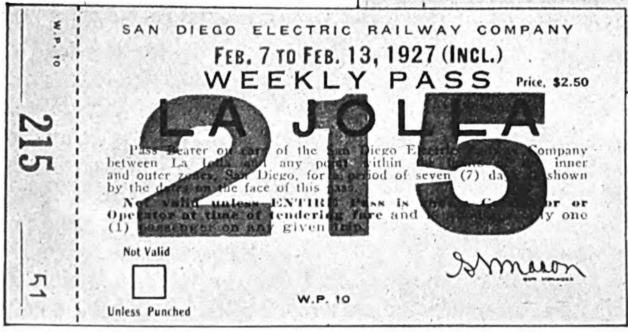
Samples of weekly passes used on the San Diego railway, of which 7.831 were sold during the week of Jan. 10 at a price of $8,221.75

Above, monthly school pass, sold at $1.

In center, city division weekly pass, sold for $1.

Below, at left, interurban pass, covering seven zones on the La Jolla line, sold at $2.50.

Below, at right, weekly tourist pass, entitles holder to ride over all branches of the system except the long division to La Jolla. Price, $1.75.



W. P. 10 215 51

SAN DIEGO ELECTRIC RAILWAY COMPANY

FEB. 7 TO FEB. 13, 1927 (INCL.)

WEEKLY PASS Price, $2.50

LA JOLLA

215

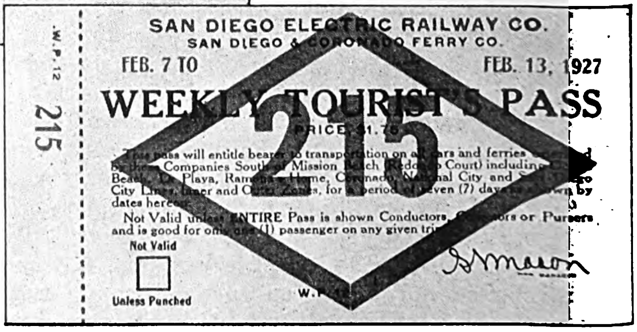
Pass Bearer on cars of the San Diego Electric [illegible] Company between La Jolla and any point within [illegible] inner and outer zones, San Diego, for a period of seven (7) days as shown by the dates on the face of this pass.

Not valid unless ENTIRE Pass is [illegible] or Operator at time of tendering fare and [illegible] only one (1) passenger on any given trip.

Not Valid ☐ Unless Punched

S. Mason
GEN. MANAGER

W. P. 10



W. P. 12 215

SAN DIEGO ELECTRIC RAILWAY CO.
SAN DIEGO & CORONADO FERRY CO.

FEB. 7 TO FEB. 13, 1927

WEEKLY TOURIST'S PASS

PRICE $1.75

215

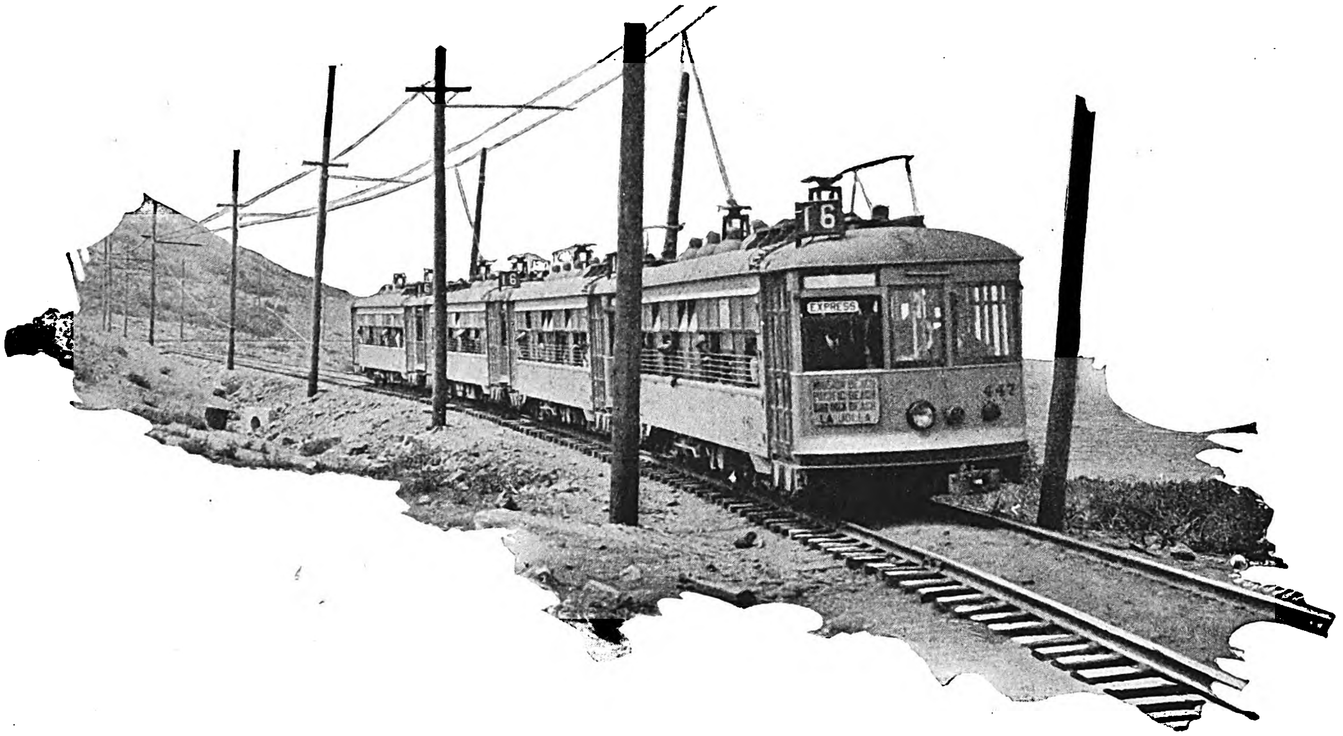
This pass will entitle bearer to transportation on all cars and ferries [illegible] by these Companies South of Mission Beach (Redondo Court) including [illegible] Beach, La Playa, Ramona Home, Coronado, National City and San Diego City Lines, Inner and Outer Zones, for a period of seven (7) days as shown by dates hereon.

Not Valid unless ENTIRE Pass is shown Conductors, [illegible] or Pursers and is good for only one (1) passenger on any given trip.

Not Valid ☐ Unless Punched

S. Mason

W. P. 12



Where the Ocean Beach and La Jolla lines operate over the same track two-car trains are sometimes coupled together into four-car trains

Seven fare zones cover the longest of the interurban lines of the San Diego Electric Railway. Use is made of the automatic coupler for making and breaking up trains of the Ocean Beach and La Jolla lines at the junction of the two routes. On the interurban system the zone fare is collected within the car by the conductor. Two-car trains are operated to the junction point with three men. The forward car has the motorman and conductor, while the rear car has the combination motorman-conductor-operator. Beyond the junction the operator of the second car becomes the motorman and in addition collects the small number of fares in that short branch of the division. Sometimes four-car trains are operated.

changed over and the company is going ahead with the installation of leather-upholstered seats in the newer type of car. These improvements in the interior appointments, combined with an improved painting schedule, assisted materially in popularizing the street car ride.

On the Ocean Beach and Mission Beach-La Jolla interurban line the automatic coupler is used when the break in the train is made at the junction of the two lines. Its use has speeded up considerably this operation and has helped to meet the direct competition of one of the large established bus lines in the state. However, because of the modern type of equipment used and the speed and frequency of the service, the company feels that it is making gains even against well-operated bus competition.

New Traffic Regulations in Cincinnati

PEDESTRIANS have been given greater consideration in the new traffic regulations of Cincinnati, Ohio, effective May 6, according to Grover C. Smith, safety secretary of that city, who prepared a summary of this ordinance for the benefit of the public.

Section 680-5, in part, compels a motorist to stop when a pedestrian indicates his intention to board an approaching street car, provided the street car is within 100 ft. of the pedestrian. This rule applies where there is no safety zone.

In the section on speed limits, motor coaches are limited to a maximum speed of 25 m.p.h.

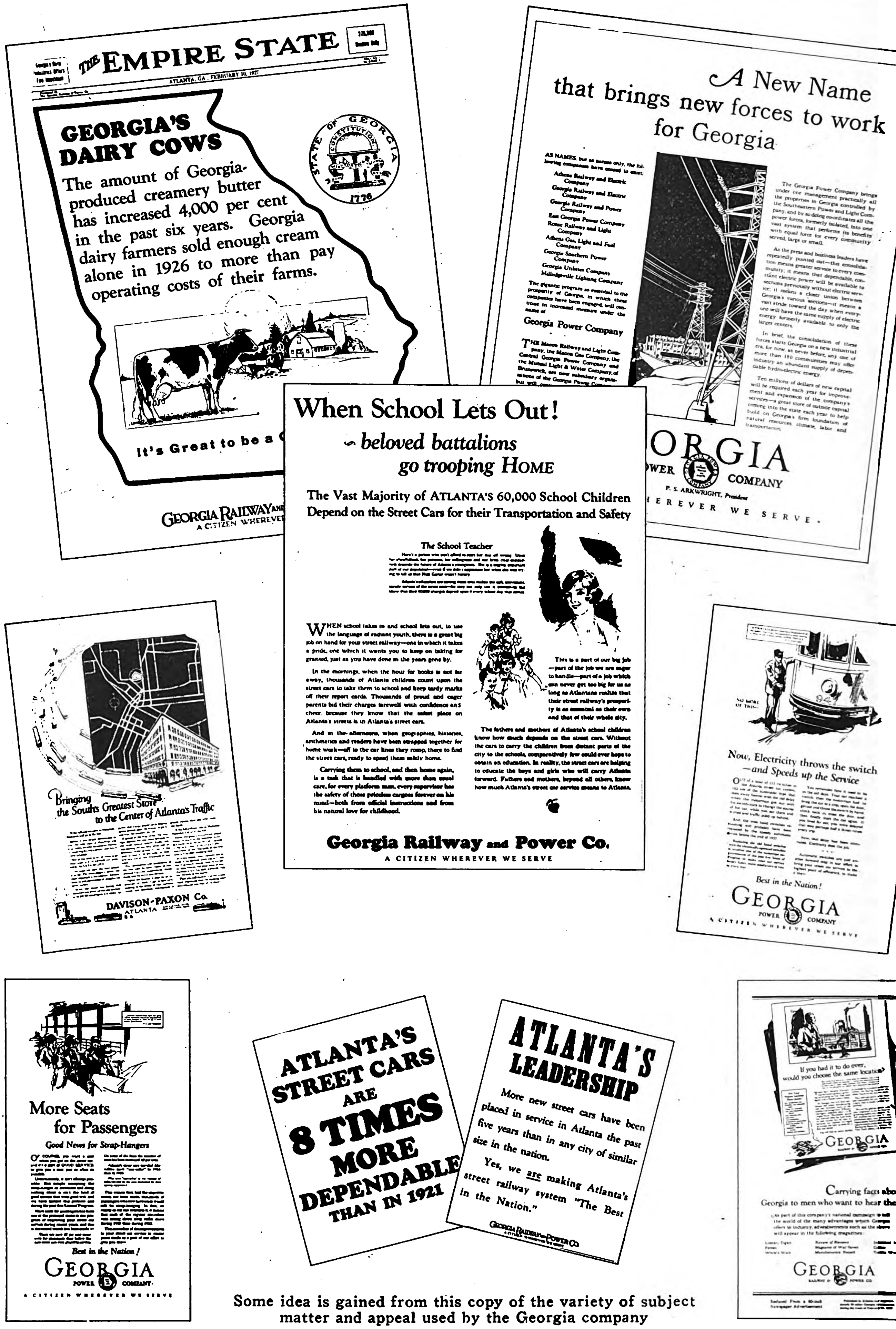
Steps were also taken to reduce congestion and traffic delays. Mr. Smith states on this score:

> One very serious problem in the past has been traffic obstruction and delay caused by backing trucks to the curb to unload. Under the 1927 ordinance this is prohibited in the congested district, excepting that coal trucks and building material trucks are permitted to back into the curb to unload between certain hours only. Outside the congested districts trucks may back to the curb at an angle not greater than 45 deg. The city manager is authorized to issue permits to back trucks to the curb in cases where it will be impossible to unload otherwise.

The ordinance has several new provisions for parking. The safety secretary announces that this ordinance is less restrictive on this point. In explaining this phase he says, in part: "The old ordinance prohibited all parking between the hours of 6:30–9:30 a.m. in the congested district. The new ordinance makes no blanket restrictions, but provides that police signs may forbid parking where the interests of the public require it. Under the present ordinance more than 50 per cent of the streets in the congested district will be open for parking between 7 and 9 a.m., whereas under the ordinance that was formerly in effect there was no parking at this time.

"It is the desire of the administration to provide as much curb parking space as possible. In order to do this the new ordinance prohibits the placing of unauthorized 'No Parking' signs or other traffic markers on any sidewalk or street. In this connection and in order to take care of the acute situation that has developed in the downtown section of the city the city manager is empowered to set aside loading space for any business house where he may deem the same to be necessary."

In regard to taxicabs, the most important change in the ordinance is that four taxicabs will be permitted to park anywhere in any city block not including those cabs that may be parked on authorized taxicab stand sites.



THE EMPIRE STATE

ATLANTA, GA., FEBRUARY 10, 1927

GEORGIA'S DAIRY COWS

The amount of Georgia-produced creamery butter has increased 4,000 per cent in the past six years. Georgia dairy farmers sold enough cream alone in 1926 to more than pay operating costs of their farms.

It's Great to be a G

GEORGIA RAILWAY AND
A CITIZEN WHEREVE

A New Name that brings new forces to work for Georgia

AS NAMES, but as names only, the following companies have ceased to exist:

Athens Railway and Electric Company
Georgia Railway and Electric Company
Georgia Railway and Power Company
East Georgia Power Company
Rome Railway and Light Company
Athens Gas, Light and Fuel Company
Georgia Southern Power Company
Georgia Utilities Company
Milledgeville Lighting Company

The gigantic program so essential to the prosperity of Georgia, in which these companies have been engaged, will continue in increased measure under the name of

Georgia Power Company

THE Macon Railway and Light Company, the Macon Gas Company, the Central Georgia Power Company and the Mutual Light & Water Company, of Brunswick, are now subsidiary organizations of the Georgia Power Com
but will

The Georgia Power Company brings under one management practically all the properties in Georgia controlled by the Southeastern Power and Light Company, and by so doing co-ordinates all the power forces, formerly isolated, into one vast system that performs its benefits with equal force for every community served, large or small.

As the press and business leaders have repeatedly pointed out—this consolidation means greater service to every community; it means that dependable, constant electric power will be available to sections previously without electric service; it means a closer union between Georgia's various sections—it means a vast stride toward the day when everyone will have the same supply of electric energy formerly available to only the larger centers.

In brief, the consolidation of these forces starts Georgia on a new industrial era, for now, as never before, any one of more than 180 communities may offer industry an abundant supply of dependable hydro-electric energy.

Ten millions of dollars of new capital will be required each year for improvement and expansion of the company's services—a great store of outside capital coming into the state each year to help build on Georgia's firm foundation of natural resources, climate, labor and transportation.

ORGIA
WER COMPANY
P. S. ARKWRIGHT, President
HEREVER WE SERVE.

When School Lets Out!

beloved battalions go trooping HOME

The Vast Majority of ATLANTA'S 60,000 School Children Depend on the Street Cars for their Transportation and Safety

The School Teacher

WHEN school takes in and school lets out, to use the language of radiant youth, there is a great big job on hand for your street railway—one in which it takes a pride, one which it wants you to keep on taking for granted, just as you have done in the years gone by.

In the mornings, when the hour for books is not far away, thousands of Atlanta children count upon the street cars to take them to school and keep tardy marks off their report cards. Thousands of proud and eager parents bid their charges farewell with confidence and cheer, because they know that the safest place on Atlanta's streets is in Atlanta's street cars.

And in the afternoons, when geographies, histories, arithmetics and readers have been strapped together for home work—off to the car lines they romp, there to find the street cars, ready to speed them safely home.

Carrying them to school, and then home again, is a task that is handled with more than usual care, for every platform man, every supervisor has the safety of those priceless cargoes forever on his mind—both from official instructions and from his natural love for childhood.

This is a part of our big job—part of the job we are eager to handle—part of a job which can never get too big for us as long as Atlantans realize that their street railway's prosperity is as essential as their own and that of their whole city.

The fathers and mothers of Atlanta's school children know how much depends on the street cars. Without the cars to carry the children from distant parts of the city to the schools, comparatively few could ever hope to obtain an education. In reality, the street cars are helping to educate the boys and girls who will carry Atlanta forward. Fathers and mothers, beyond all others, know how much Atlanta's street car service means to Atlanta.

Georgia Railway and Power Co.
A CITIZEN WHEREVER WE SERVE

Bringing the South's Greatest Store to the Center of Atlanta's Traffic

DAVISON-PAXON Co.
ATLANTA

NO MORE OF THIS—

Now, Electricity throws the switch—and Speeds up the Service

Best in the Nation!

GEORGIA POWER COMPANY
A CITIZEN WHEREVER WE SERVE

More Seats for Passengers

Good News for Strap-Hangers

Best in the Nation!

GEORGIA POWER COMPANY
A CITIZEN WHEREVER WE SERVE

ATLANTA'S STREET CARS ARE 8 TIMES MORE DEPENDABLE THAN IN 1921

ATLANTA'S LEADERSHIP

More new street cars have been placed in service in Atlanta the past five years than in any city of similar size in the nation.

Yes, we are making Atlanta's street railway system "The Best in the Nation."

GEORGIA RAILWAY AND POWER CO.

If you had it to do over, would you choose the same location?

GEORGIA

Carrying facts about Georgia to men who want to hear them

As part of this company's national campaign to tell the world of the many advantages which Georgia offers to industry, advertisements such as the above will appear in the following magazines:

Literary Digest
Forbes
World's Work
Review of Reviews
Magazine of Wall Street
Manufacturers Record

GEORGIA RAILWAY & POWER CO.

Reduced From a 80-inch Newspaper Advertisement

Some idea is gained from this copy of the variety of subject matter and appeal used by the Georgia company

Car Publicity as They Write It in Georgia

Marching through Georgia with the pen instead of the sword, the Georgia Power Company is selling popular transportation from practical, emotional and social angles

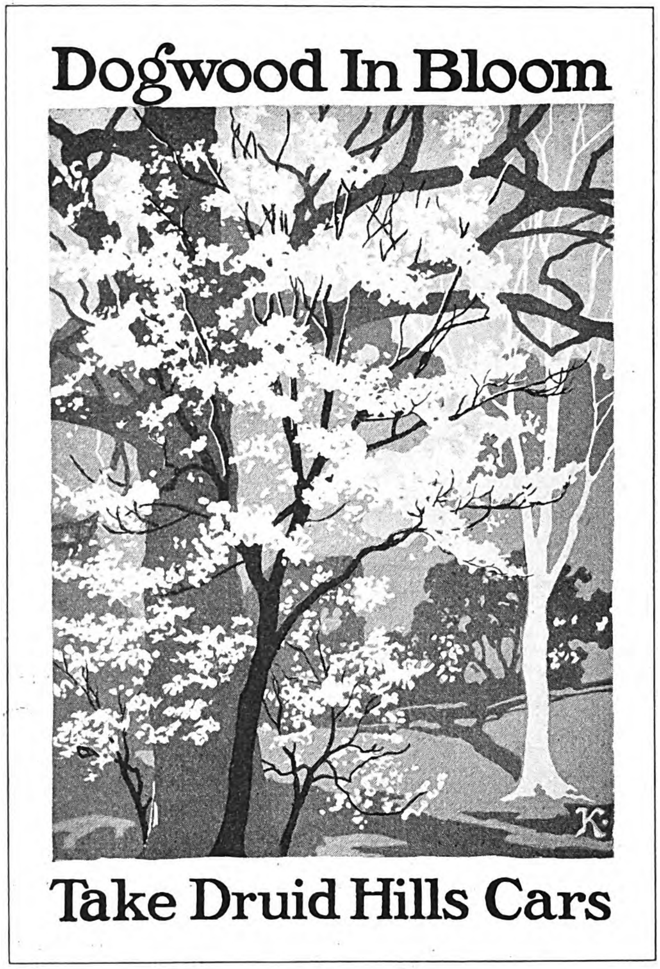
YEARS ago a certain gentleman who said "War is Hell" got a lot of unfavorable publicity in Georgia by a campaign of destruction. History records that he had a pretty rough time traversing the state and that Atlanta didn't offer him any transportation facilities. But that was before the Georgia Railway & Power Company and its successor, the Georgia Power Company, started a publicity campaign. Doubtless were the gentleman to arrive today in the "Gate City of the South," with the same crowd behind him, he would order "stack arms" and make a rush for the nearest street car, completely defeated by the force of the pen as wielded by L. K. Starr, manager of public relations, and his corps.

Whether one is wrong or right in this assertion matters little when it is evidenced that thousands of Georgia's citizens are being sold on modern street car transportation because the Georgia Power Company is using in its publicity copy logical arguments and forcible illustrations to impress the public that it strives to be "A Citizen Wherever We Serve." This is no new move on the company's part, as readers of the JOURNAL will doubtless recall that from time to time progress of the publicity campaigns has been detailed in these pages, notably in Vol. 66, page 351, and Vol. 68, page 345.

As before evidenced, the company visualizes the transportation needs in terms of those everyday contingencies that confront the average citizen. Take, for example, the recent five-column advertisement, 14 in. deep, which appeared in the rotogravure section of the Atlanta *Journal* for March 6. "Smooth Going at Home!" it was headed, and then followed this text:

> The whole family, every day, gets comfort and convenience from the street car.
>
> The cook arrived on time, the children are safely off to school, the postman has brought the morning mail, everything running nicely, and the street car helped it along!

And then the text goes on to remind one of the part a street car plays in a trip to market, a visit to a friend, or to the park with the children or to the movies. All without parking worries, or in the latter event, the strain incident to driving in after-theater traffic. This advertisement was well balanced by sketches of father, mother and the children, and ample white space gave the reader the impression of dignity.



Skillful use is made here of the esthetic appeal

Turning from this homely appeal, one finds a subtle piece of copy directed at the "Men who never ride the street cars"; in other words, those citizens who roll up to their places of business in a limousine. This class of Georgian is not presented with an argument to forsake his means of transportation, but rather is reminded in a few pithy paragraphs that his business depends on the street car. For instance, one reads:

> You may be the head of a great manufacturing plant. Your limousine carries you there and calls for you at your convenience. But your workers depend on street car service without exception.
>
> You may never ride the street cars. You may drive to the office in your own car, day after day, the year round. But the people who keep your business going are street car riders.
>
> The banker knows that street car riders have built his bank.
>
> The capitalist also, and the real estate man—they know that property values are based on street car service.
>
> They (street cars) keep the cash registers ringing.

Here the responsibility for seeing that fair treatment is accorded the utility, carefully interwoven with an economic argument, is forcibly presented to the heads of big business.

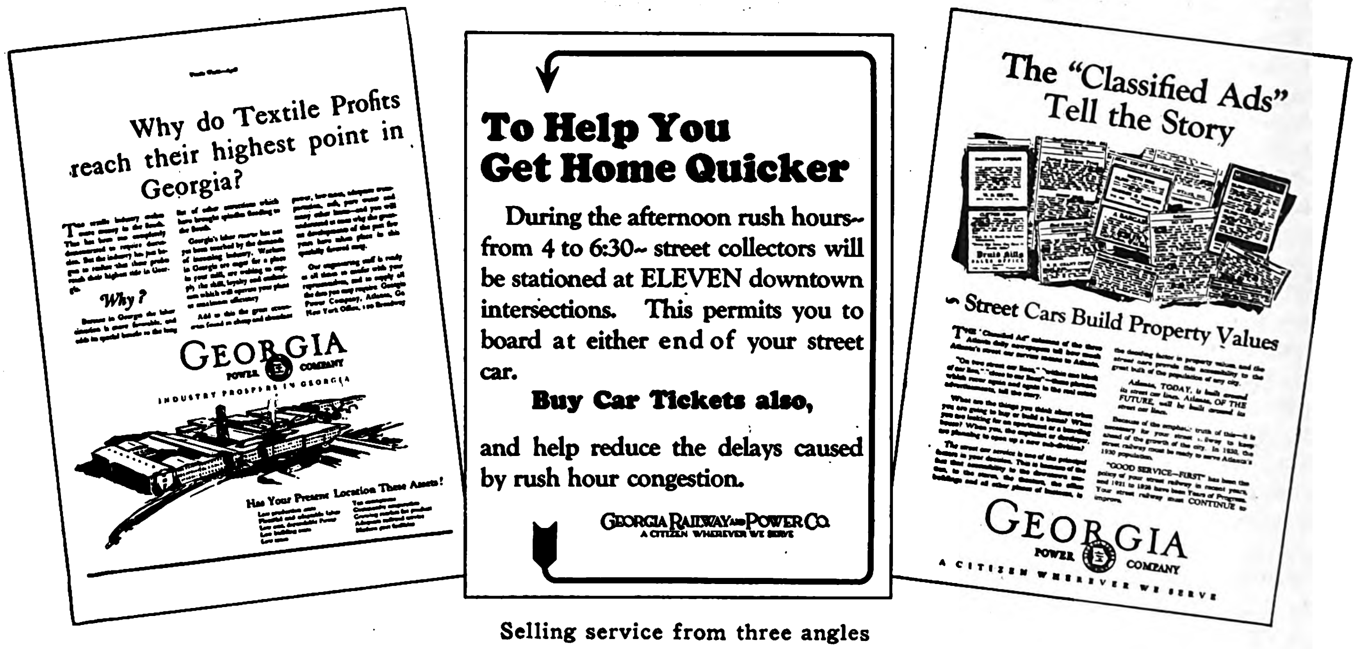
In the March 12 issue of this paper W. H. McAloney, superintendent of equipment, told the field that in the last three years Atlanta has set the torch to 170 old cars and in their place are 196 new four-motor, low-floor cars. In a 60-in. advertisement appearing in the Atlanta *Journal, Constitution* and *Georgian* the traveling public was told something of the new cars in a way that appeals to the modern idea for speed. "Pick Up and Get Away" was the appeal slogan for this piece of copy and the Atlanta citizen was invited to imagine the street cars in terms usually associated with the operation of a high-class automobile. The following paragraph will suffice as an example of the text:

> A wealth of reserve power and speed is available—for the new street cars on city lines are capable of 30 miles an hour, while the palatial new interurban cars will run at 50! Of course, such speed is not needed or used, but isn't there a satisfaction in knowing what reserves of speed are in the powerful motors of your street cars?

Another forceful example of copy reveals that a new car talking point is developed also from the standpoint of miles per hour which have been gained in operation since 1923. One outstanding paragraph, it will be noted, contains a comparison of speed of Atlanta's cars with that of Chicago's. Another paragraph acknowledges the company's debt to the public by reason of the public's co-operation in eliminating car stops. Also to the efficiency of the company's employees. This copy, like all of the other samples on review, is characterized by extreme modesty in so far as the Georgia Power merchants realized that they must locate where the street cars delivered the most passengers to the business district.

In glancing over other samples of the company's publicity copy one is particularly struck with the unique twist that is given to small and often forgotten equipment items and how these items are woven into powerful selling arguments. For instance, one piece of copy shows the motorman down on the ground in front of his car. He is holding an old switch stick. To the left of him are the words, "No more of this—," and below is this central theme:

> Now electricity throws the switch—and speeds up the service.
>
> Out of a total of 111 switches in the Atlanta street car system 102 are of the automatic type that does away forever with the delays when the motorman got out his switch stick to change the course of his car while you sat there and waited and traffic piled up behind.



Why do Textile Profits reach their highest point in Georgia?

Why?

GEORGIA POWER COMPANY

INDUSTRY PROSPERS IN GEORGIA

Has Your Present Location These Assets!

To Help You Get Home Quicker

During the afternoon rush hours—from 4 to 6:30—street collectors will be stationed at ELEVEN downtown intersections. This permits you to board at either end of your street car.

Buy Car Tickets also,

and help reduce the delays caused by rush hour congestion.

GEORGIA RAILWAY AND POWER CO.
A CITIZEN WHEREVER WE SERVE

The "Classified Ads" Tell the Story

Street Cars Build Property Values

GEORGIA POWER COMPANY
A CITIZEN WHEREVER WE SERVE

Selling service from three angles

Company is concerned, which probably accounts for the fact that the Davidson Paxon Company, one of the largest department stores in Atlanta, in a full-page advertisement, used the street car service as a central theme when acquainting the public with the accessibility and convenient location of its new store at Peachtree and Ellis Streets.

As the reader may not be able to decipher some of the paragraphs of this ad appearing in the accompanying illustrations, two paragraphs are quoted to show what a vital element street car service was considered when these merchants decided on a new location:

> When you realize that during 1926 our street cars alone carried approximately 90,000,000 passengers, it is readily apparent that a large proportion of Atlanta's people depend upon the trolleys to get to and from the business districts.
>
> A glance at the map reveals the strategic position the new store occupies to the street railway system. Every line approaching the business center from all directions either passes in front of the store or near it. A few steps, at most, and you are on the threshold of our store.

"If the hill will not come to Mahomet, Mahomet will go to the hill." This was one of the italicized paragraphs of the ad, which strikingly illustrates how these

Another advertising twist that is of great interest consists of giving the public a comparison of the power failures of 1922 with those of 1926. This argument backs up the central publicity message: "Dependable even in storms! Service when you need it." The text also contains a paragraph such as this:

> Out of the 365 days in 1926 there was 348 days on which there were no interruptions of this kind at all. Thanks to a complete modernization of our electric distribution system.

Pursuing the dependable theme, another advertisement, captioned "Around the World Without a Breakdown," explains to the layman what the term "Pull In" means, and then proceeds to give some telling figures as to how Atlanta stands with respect to "miles per pull in."

The text goes on to recount that the street railway companies have a "Southern League" of their own, and the 1926 totals on "miles per pull in" put Atlanta ahead of most of the other Southern cities in the league. Then a table is shown of Atlanta as compared with Little Rock, Memphis, Birmingham, Mobile, Dallas, Covington, Ky., Montgomery and Chattanooga.

Again driving home the dependability and service ideas large advertisements feature the tremendous responsibility that is placed on the street car company when the doors of the big stores close. From this theme one turns to the copy, reproduced elsewhere, which sells the street car on the basis of what it does in developing property.

In the realm of strictly industrial copy, one is attracted by an enormous advertisement captioned: "A New Name that Brings New Forces to Work for Georgia." Here a bold center illustration in black and white, showing a high-power transmission line, is flanked on either side by text describing the new combinations which made the Georgia Power Company successor to the Georgia Railway & Power Company. This copy was published in page form in practically every daily and weekly newspaper in Georgia.

In the field of national advertising the company has been most active. In this case, of course, Georgia is being sold on the basis of its hydro-electric developments. These ads have appeared in *Industrial Index, Furniture, Manufacture and Artisan, Industrial Management, Forbes, Cotton, Manufacturers' Record, American Woolen-Cotton Reporter, Finance, Printers' Ink, Magazine of Wall Street, Textile World* and *System,* and with the advent of the new year such magazines of general circulation as the *Literary Digest* and *World's Work* have been added to the company's advertising list.

While strenuous efforts have been exerted in national and local newspaper and periodical advertising, the company has not neglected its campaign of "window pasters," which for the most part are done in two-color inks on a background of white, yellow, green and orange paper. These pasters are in three sizes, 9½x18 in., 16x21 in. and 22½x27 in. In the smallest class such text matter as this has been used:

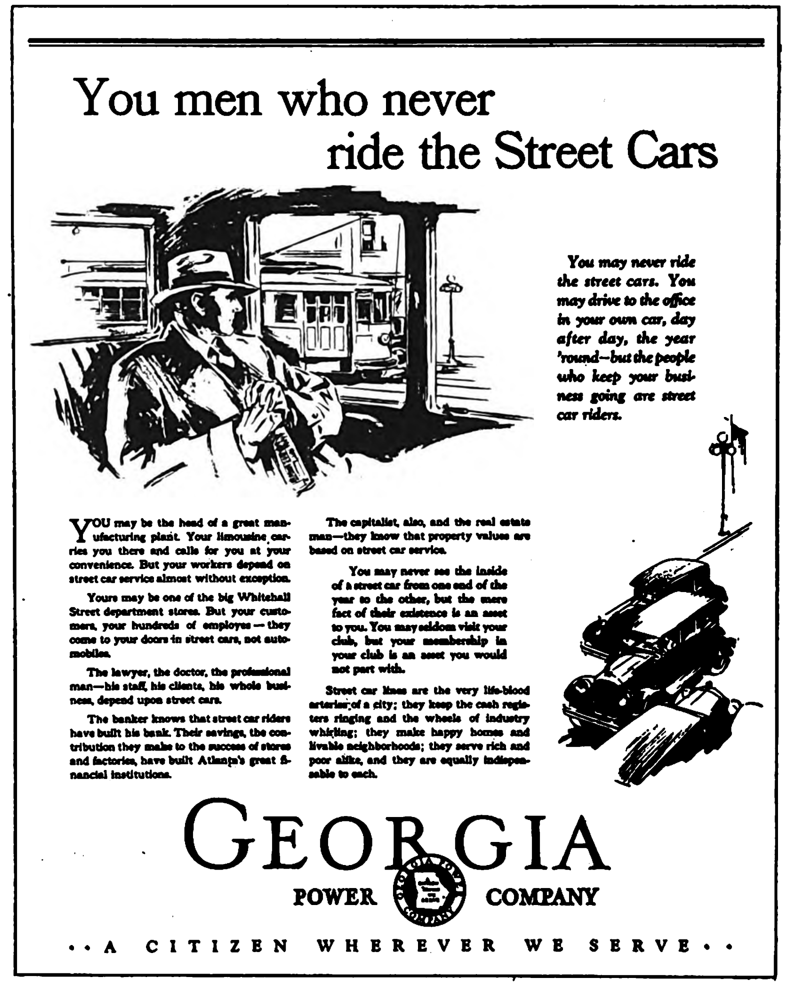
> For Atlanta's sake your street railway must be ready to serve the new population Atlanta will have in 1930. It's a good street car service now! It must be better in 1930. We believe that the only means of obtaining the friendly good will of the public is to deserve it. (This is signed by P. S. Arkwright, president of the company.)
>
> For your children's sake! Skating and playing in the streets not only are dangerous but are prohibited by law. Protect your children. Keep them out of the streets.
>
> Buy one dollar's worth of convenience—fifteen car tickets—a week's supply—for a dollar. Give it a trial.

On 16x21 pasters such appeals as these are made:

> Who pays for accidents? Can you afford weeks in a hospital? Your savings wiped out and probably heavy debts, perhaps the loss of your job? What of your family, your wife, your children? Can they afford to have you injured, perhaps permanently crippled? Think and practice safety.

As further proof that the Georgia Power Company thinks in other terms besides money and revenue, window pasters of the size 22½x27 carry such esthetic messages as this: "Dogwood in bloom. See it, but leave it for others to see." And from the commercial side, such captions as these: "Our goal, the best street car service in the nation." "More dependable! Power failures reduced—1922, 148; 1926, 17." And then the civic appeal, "Please don't throw paper on the streets. Help keep Atlanta's streets clean." "Your street railway must continue to improve."

And now to sum up briefly the publicity policy of the Georgia property one turns to the words of L. K. Starr: "Our street railway," he writes, "has made an unusually good record during the past five years. We have increased the speed of the cars, reduced power failures, increased the seating capacity and bought more new street cars than any other city of Atlanta's size in the nation. We are now telling the public of these improvements and future advertisements will tell about others.



You men who never ride the Street Cars

You may never ride the street cars. You may drive to the office in your own car, day after day, the year 'round—but the people who keep your business going are street car riders.

YOU may be the head of a great manufacturing plant. Your limousine carries you there and calls for you at your convenience. But your workers depend on street car service almost without exception.

Yours may be one of the big Whitehall Street department stores. But your customers, your hundreds of employes—they come to your doors in street cars, not automobiles.

The lawyer, the doctor, the professional man—his staff, his clients, his whole business, depend upon street cars.

The banker knows that street car riders have built his bank. Their savings, the contribution they make to the success of stores and factories, have built Atlanta's great financial institutions.

The capitalist, also, and the real estate man—they know that property values are based on street car service.

You may never see the inside of a street car from one end of the year to the other, but the mere fact of their existence is an asset to you. You may seldom visit your club, but your membership in your club is an asset you would not part with.

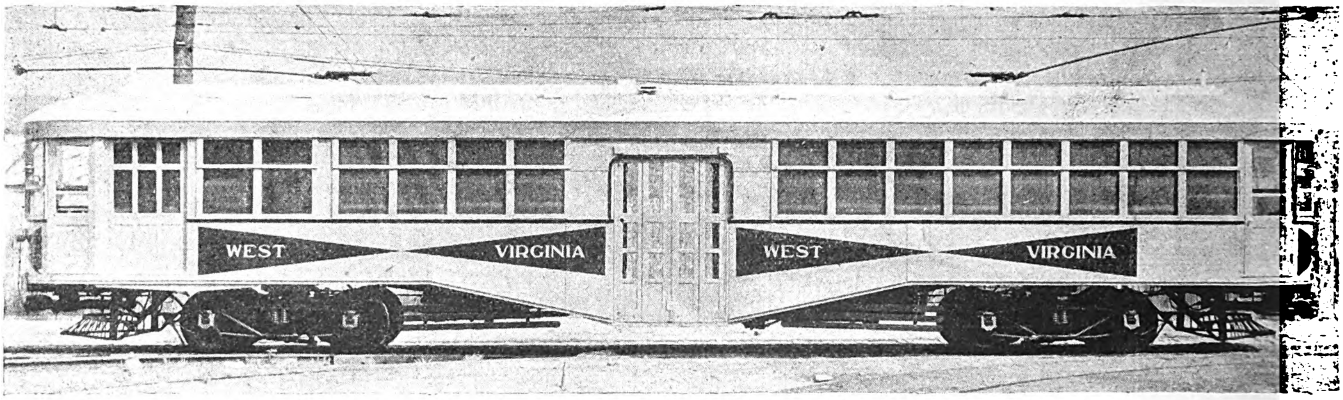
Street car lines are the very life-blood arteries of a city; they keep the cash registers ringing and the wheels of industry whirling; they make happy homes and livable neighborhoods; they serve rich and poor alike, and they are equally indispensable to each.

GEORGIA
POWER COMPANY

· · A CITIZEN WHEREVER WE SERVE · ·

A direct bid for support from the capitalist

"You will notice the slogan 'Best in the Nation' is being used on each of these advertisements. This appeals to the pride of Atlanta people and apparently is having excellent effect. Recently we decided to test the effectiveness of these advertisements, and we asked our patrons to write us letters about the service. More than 200 letters were received in about ten days and, with the exception of two or three, all were warmly favorable to the company and its policy of 'Good service first.' This policy of the company is expressed in a quotation from one of Mr. Arkwright's speeches, 'A street railroad must have the good will of the public, but to get the good will it must deserve it. First of all it must render good service,' which is carried in a box in most of the advertisements. It is our intention from this point on in this series of advertisements to bring this idea of good service into greater prominence in the advertisements."



Painting of the car has been done with the colors of West Virginia University

Introducing the "West Virginia"

West Penn Railway Buys de Luxe Car Developed Especially for Fairmont-Clarksburg Limited Service—Comfort Features Attract Many New Patrons

IN OPERATION between Fairmont and Clarksburg, W. Va., is a new passenger interurban car which has recently been purchased by the Monongahela-West Penn Public Service Company. Known as the "West Virginia," in honor of West Virginia University, the body of the car has been painted in old gold and the name lettered in blue, these being the colors of the university.

Every description of up-to-date rolling stock which is being purchased these days of necessity places a great deal of emphasis on the various facilities which are provided to add to the comfort of the passenger. The "West Virginia" may differ in degree, but not in kind, from this general rule. Deep spring leather seats are provided, and there is a group of facing seats to accommodate passengers who wish to indulge in a game of cards or some similar pastime during the trip.

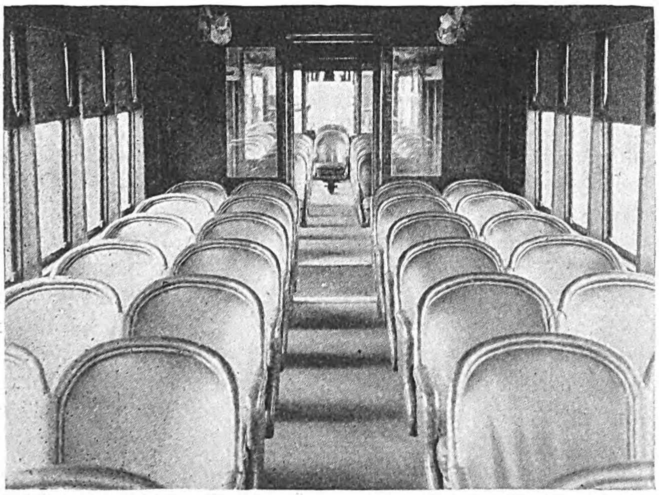
A Seat for Every Passenger

Including the new single seats which are located in the center of the aisle near the rear vestibule, seats for 63 passengers are provided. The company has adopted a rule applying to this new car, which states that at no time will more passengers be accepted than may be provided with seats, so that crowding is impossible.

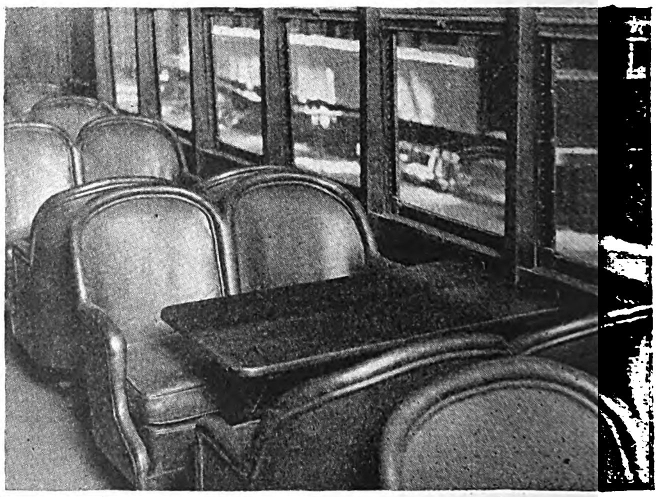
The car is of the double-truck, all-steel, center-entrance type and was built by the Cincinnati Car Company. Electrical equipment was provided by the Westinghouse Electric & Manufacturing Company, while the trucks were built in the shops of the West Penn Railways. This latter equipment was developed especially for operation over the Fairmont-Clarksburg run. The motors, of which four are provided, have a capacity of 65 hp. each.

The car is geared for a maximum speed of 45 to 47 m.p.h. It is 58 ft. in length and is divided into a regular passenger compartment, accommodating 35 passengers, and a smoking compartment, with seats for 28 passengers. Interior illumination is by 25 50-watt lights. The car is heated by 27 single coil, 400-watt heaters, which are thermostatically controlled. The cost complete for the car was $21,367; the body and underframe costing $10,972, the electrical equipment $5,725 and the trucks $1,921. Special seating equipment and interior fittings added $2,749 to the total cost.

The car makes only four stops between Fairmont and Clarksburg, the elimination of other stops and the higher operating speed of the car making possible a reduction of 25 minutes from the former running time between the two cities. Public patronage of the "West Virginia" has been increasingly heavy since it was first placed in service and there has been much favorable comment in the various communities served by the car concerning this effort of the West Penn Company to better its service.



Looking to the rear through the smoking compartment, showing the seats located in the aisle near the vestibule



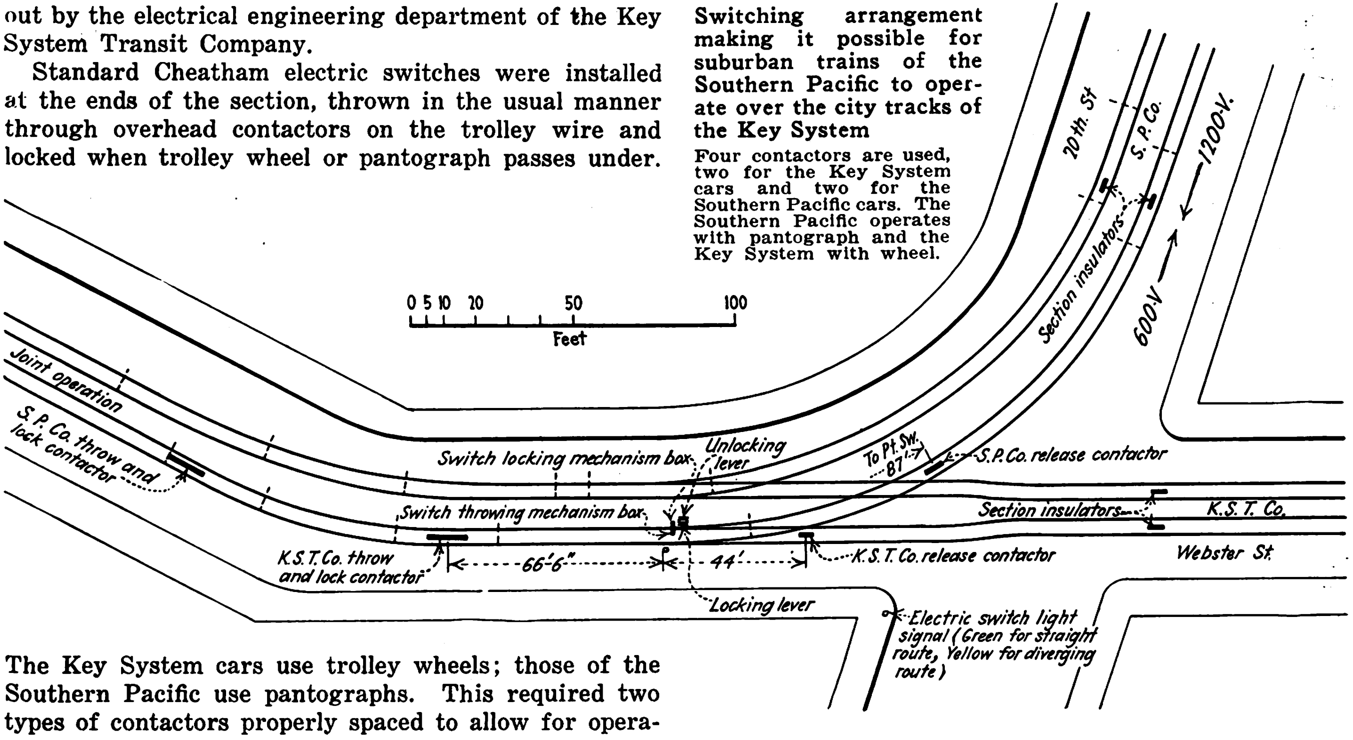
For the convenience of patrons who desire to indulge in a card game these facing seats were installed

Electric Track Switch Protection for Joint Operation

Key System Transit Company and Southern Pacific Railroad have novel system for protecting a short section of track in Oakland, Cal. Both pantograph and trolley wheel contactors are employed

JOINT operation by the Key System Transit Company's cars and the suburban cars of the Southern Pacific Railroad over a short section of the former's city track in Oakland, Cal., on Webster Street between Fourteenth and Twentieth Streets, required the installation of electric switches at each end of the joint track and in addition a locking device to guard against either company's cars splitting the switch. An ingenious arrangement for doing these two things was worked out by the electrical engineering department of the Key System Transit Company.

Standard Cheatham electric switches were installed at the ends of the section, thrown in the usual manner through overhead contactors on the trolley wire and locked when trolley wheel or pantograph passes under.


20th St
S.P. Co.
1200-V.
Section insulators
600-V
0 5 10 20 50 100
Feet
Joint operation
S.P. Co. throw and lock contactor
Switch locking mechanism box
Unlocking lever
To Pt. Sw. 87
S.P. Co. release contactor
Switch throwing mechanism box
Section insulators
K.S.T. Co.
K.S.T. Co. throw and lock contactor
66'6"
44'
K.S.T. Co. release contactor
Webster St
Locking lever
Electric switch light signal (Green for straight route, Yellow for diverging route)

Switching arrangement making it possible for suburban trains of the Southern Pacific to operate over the city tracks of the Key System

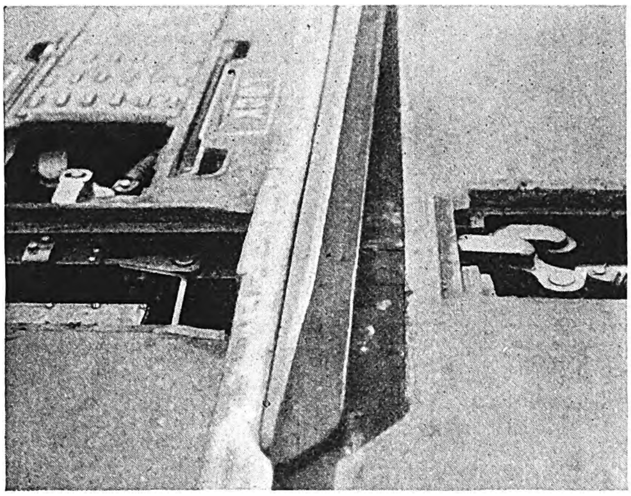
Four contactors are used, two for the Key System cars and two for the Southern Pacific cars. The Southern Pacific operates with pantograph and the Key System with wheel.

The Key System cars use trolley wheels; those of the Southern Pacific use pantographs. This required two types of contactors properly spaced to allow for operation of both wheel and pantograph.

Throw-and-lock contactors, one for wheel and the other for pantograph, are placed in advance of the switch a sufficient distance to allow for the throwing and locking of the switch before the front wheels of the forward truck reach the switch. Releasing contactors beyond the switch unlock it when trolley wheel or pantograph passes under them. The switch is also connected electrically with a signal having one green light and one yellow light. Green indicates that the switch has been properly lined up and locked so that the car may proceed over the straight track; yellow that the switch is set for the diverging route. After the car has passed the releasing contactor, thus unlocking the switch, neither green nor red light shows. Absence of a light in this signal as the car approaches the switch indicates that it is unlocked and that the motorman may proceed past the first contactor. However, after passing the contactor, if a light does not appear it indicates that the switch is not properly locked and that the car must be stopped before passing over the switch.

Should the switch fail to take the correct position or the signal fail to indicate the proper direction after the car passes the throw-and-lock contactor the crew must set the switch manually. For this purpose two hand throw levers are placed near the switch mechanism, one on each side of the locking device. One is to lock the switch, the other to unlock it. After the crew has determined if the tongue-way is free from obstruction the unlocking lever may be raised and the switch tongue thrown by a switch iron to the correct position. The unlocking lever is then lowered and the locking lever raised to lock the switch in this position. The car may then proceed after the crew has ascertained that it is locked, either automatically, as indicated by the signal light, or by hand.

Because of the two types of equipment it was unnecessary to instruct the motorman in throwing the switch, with power on for one way and power off for the other. When the pantograph passes its contactor the switch is automatically thrown in position and locked. Sim-



Switch tongue is thrown by mechanism located between rails. It is locked in position by mechanism located outside of track and parallel to the rail, as shown in the upper left hand corner

ilarly when the wheel passes its contactor the switch is thrown and locked in the other position.

The contactor for the pantograph consists of a light framework of two runners approximately 10 ft. long, supported at the ends above the trolley wire and at two center points below the wire. One runner is broken at the middle, its ends being separated by an insulated joint. The continuous runner is positive, 600 volts, while the broken one is negative.

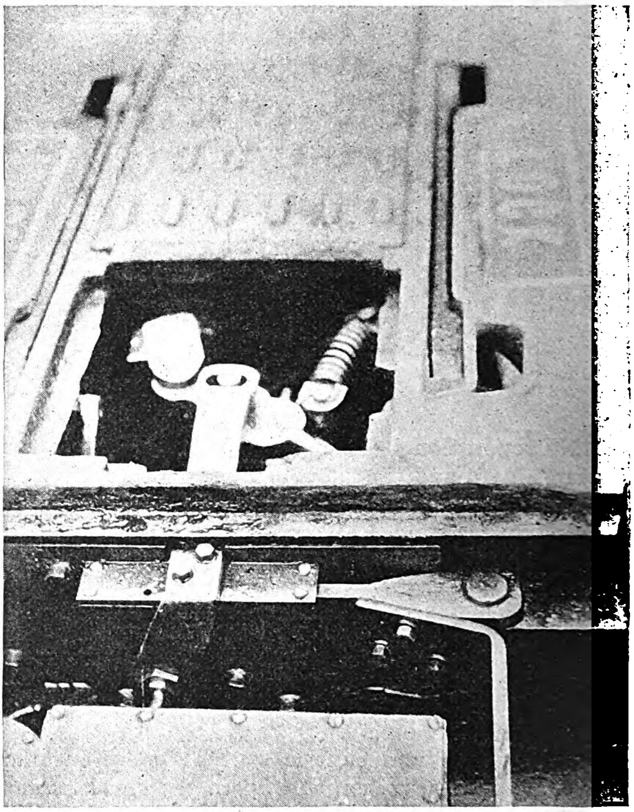
As the pantograph rides down on the runners of the contactor it first closes the circuit which throws the switch into the proper position and then closes the locking circuit.

RUNNERS DEPRESS PANTOGRAPH WHEN PASSING WHEEL CONTACTOR

The contactor for the trolley wheel is of the standard type. However, one side is split, so that the wheel first closes the switch-throwing circuit and then the locking circuit.

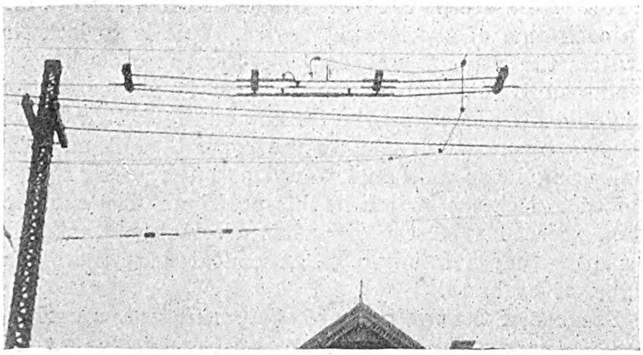
To protect the wheel contactors from the pantograph, runners are placed on the wire so that the pantograph is lowered. The wheel, of course, has no difficulty in passing through the pantograph contactor. Similar contactors are placed beyond the switch. However, in this case no protection is required for the wheel contactor which is on the track over which operate only the traction cars.

Energy from the contactors is brought down to a standard electrically operated track switch. The first circuit closed throws the switch and also operates in a signal switch box one-half of a switch contactor. The second circuit closed by the pantograph or trolley wheel operates a similar switch-throwing mechanism placed parallel to the rail. This solenoid thrusts a bolt through the stem of the main switch-throwing arm. It also moves in the signal indicating box the other half of the contactor switch. The proper alignment of these signal-indicating switches lights either the yellow or green signal on the pole.

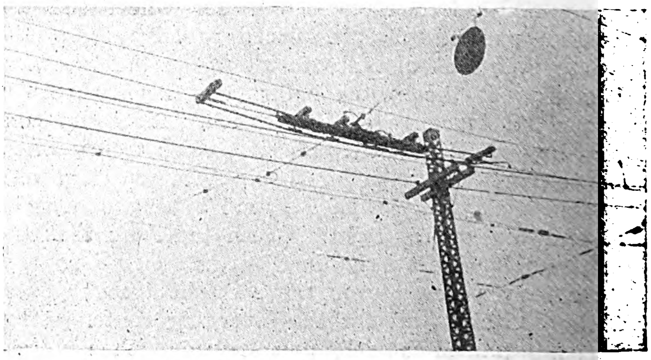


The locking mechanism is similar to the throwing mechanism. It thrusts a bolt through the extended end of the throwing arm. The signal changing box is in the immediate foreground. Rods from both the operating and locking mechanism close the proper switches to obtain the proper indication

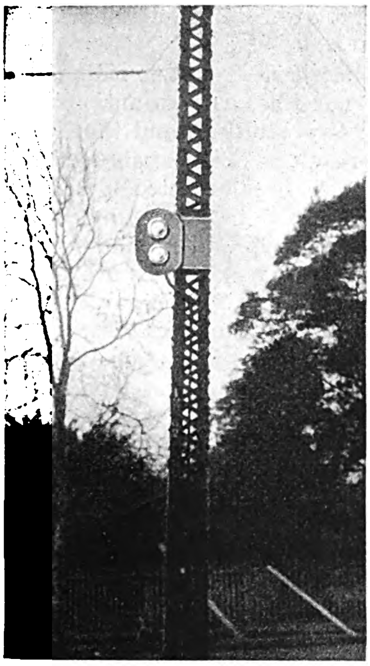
When the pantograph or wheel passes the release contactor the locking solenoid is energized, the bolt withdrawn from the control lever and the signal-indicating circuit opened.



Contactor for throwing and locking switch for Southern Pacific cars. One runner of this contactor is broken, allowing two separate circuits to be closed as the pantograph passes under the contactor



Contactor for trolley wheel is protected by runners which are placed on the wire to lower the passing pantographs and permit them to run by without closing the signal circuit



A green light in this signal indicates that switch has been properly lined up and locked for straight track. A yellow light indicates that switch is set and locked for diverging route

All of the operating mechanism is placed in the street and covered by heavy steel plates. However, the manual unlocking and locking levers are placed so as to be accessible to the train crew. In this installation it was necessary to specify the type of equipment to be operated over the switches and the number of cars in a train. Contactors for the Southern Pacific cars are located 151 ft. ahead of point of switch, requiring that the Southern Pacific train, if a single car (72 ft. 4½ in.), must have the pantograph on the rear end, while a two-car train must have the motor car on the forward end and the pantograph at the rear of this car. As the traction system operates only single cars with trolley pole at the rear these precautions were unnecessary.

Ohio Companies Increase Returns from Freight Hauling

THAT interurban electric railways are increasing their revenue from freight hauling is evidenced by the reports submitted by these companies to the Public Utilities Commission of Ohio for the past year. These reports show that the total freight revenue of these companies was $5,780,000, an increase over the year before of more than $1,000,000, according to the Ohio Committee on Public Utility Information. City, suburban and interurban electric railway companies last year carried 865,921,782 revenue passengers, which showed that the electric railway as a means of mass transportation in cities and means of travel between Ohio communities is exceedingly popular.

In order to improve their rolling stock and other equipment the electric railway companies of Ohio last year increased their investment by almost $42,000,000. These companies now have an investment of $357,955,000. Last year the electric railways of the state paid out $5,264,578 in taxes, and in addition $56,709,976 in operating expenses. The operating expenses increased over the year before by more than $2,250,000. The track mileage of these companies totaled 2,882.

Revenue Increased by Co-ordination of Bus and Car Service

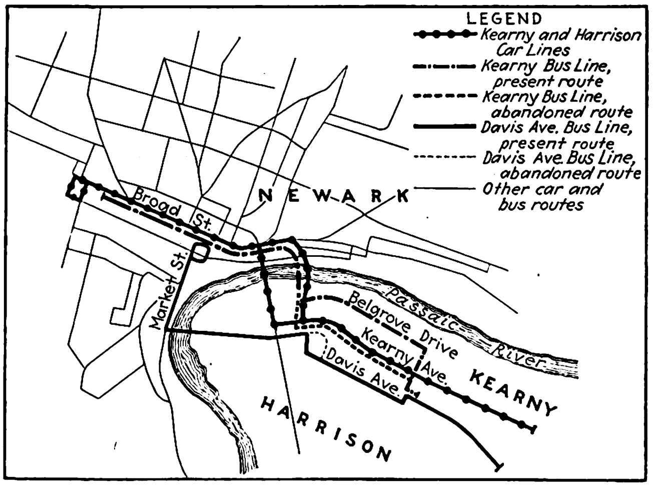
Route Changes Recently Made by Public Service Railway Have Eliminated Duplication in Harrison and Kearny—Transportation Is Furnished to Additional Territory

MARKED improvement in the local transportation facilities in the towns of Harrison, Kearny and Arlington, N. J., has resulted from a recent change in the routes of buses operated by the Public Service Railway. The territory within the boundaries of these three municipalities really constitutes one continuous residential community adjacent to the city of Newark, which lies across the Passaic River. Car service is given by two lines, Nos. 35 and 39 (Kearny and Harrison by name), which operate over the same track on Broad Street, Newark, and on Kearny and Midland Avenues, Kearny, diverging only for a short distance where they cross the river by different bridges. Two bus lines also serve the same general territory. The Kearny bus line, No. 36, formerly followed the route of the Kearny car line practically from end to end. The Davis Avenue bus line, No. 40, operates parallel to Kearny Avenue two blocks away to the east. An accompanying map shows the relative locations of these routes.

It was felt by the management that operation of cars and buses over the same route on Broad Street, Newark, and Kearny and Midland Avenues was an uneconomic duplication of service. After consultation with the local

36 KEARNY ARLINGTON

New houses are being built along Belgrove Drive since the establishment of bus service


LEGEND
Kearny and Harrison Car Lines
Kearny Bus Line, present route
Kearny Bus Line, abandoned route
Davis Ave. Bus Line, present route
Davis Ave. Bus Line, abandoned route
Other car and bus routes
NEWARK
Broad St.
Market St.
Passaic River
Belgrove Drive
Kearny Ave.
Davis Ave.
KEARNY
HARRISON

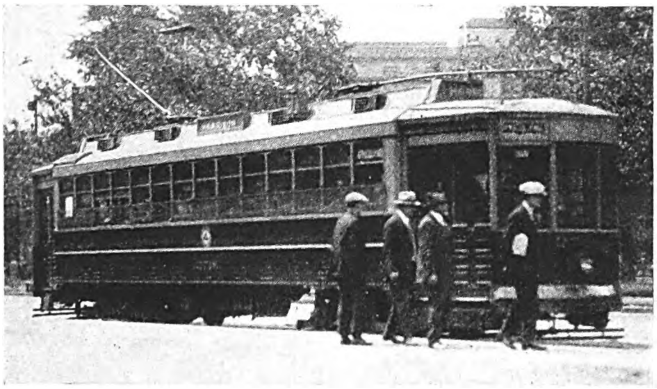
Rerouting of Public Service bus lines in Kearny has eliminated duplication of service and provided transportation facilities in new territory

municipal officials it was decided to reroute the buses to Belgrove Drive, a street approximately parallel to Kearny Avenue, two blocks to the west. The headway was increased from five minutes to six minutes. This change was made on April 22, and on that date the Davis Avenue route was extended about ¾ mile and the headway shortened. As a result of these moves transportation facilities were given too much additional territory.

At the same time the company made substantial improvements in its car service in these towns. Formerly the Harrison line operated on a fifteen-minute headway all day, while the Kearny line operated only during rush hours. Removal of the buses from Kearny Avenue necessitated an increase in car service on that street. Each line now operates a twelve-minute headway all day, so scheduled as to give six-minute service everywhere except on the short section where the two lines follow different streets.

Cars of a semi-de luxe type have replaced those formerly used. Fifteen of the company's most recent city cars have been equipped with leather-upholstered, individual seats and linoleum floor covering. They have been painted a bright red to distinguish them from the other cars, which are yellow. In general the remodeling process was similar to that of cars on the Bloomfield line of Public Service Railway as told in ELECTRIC RAILWAY JOURNAL Jan. 22. Sufficient cars have been renovated to equip completely both the Harrison and Kearny lines.

Since the new routing has been in effect, riding has decreased on the Kearny bus line, as was anticipated, and has increased on the two car lines and the Davis Avenue bus line. The net result has been a gain of about 2,400 passengers per week. This is expected to become more noticeable as the additional territory now being served for the first time builds up and produces more passengers. Already a score of new houses are being constructed along Belgrove Drive. This separation of car and bus lines to serve different districts instead of duplicating service in the same district is regarded by the company as an important step in the development of co-ordinated transportation.



The Kearny and Harrison lines of Public Service Railway have been completely re-equipped with semi-de luxe cars of this type

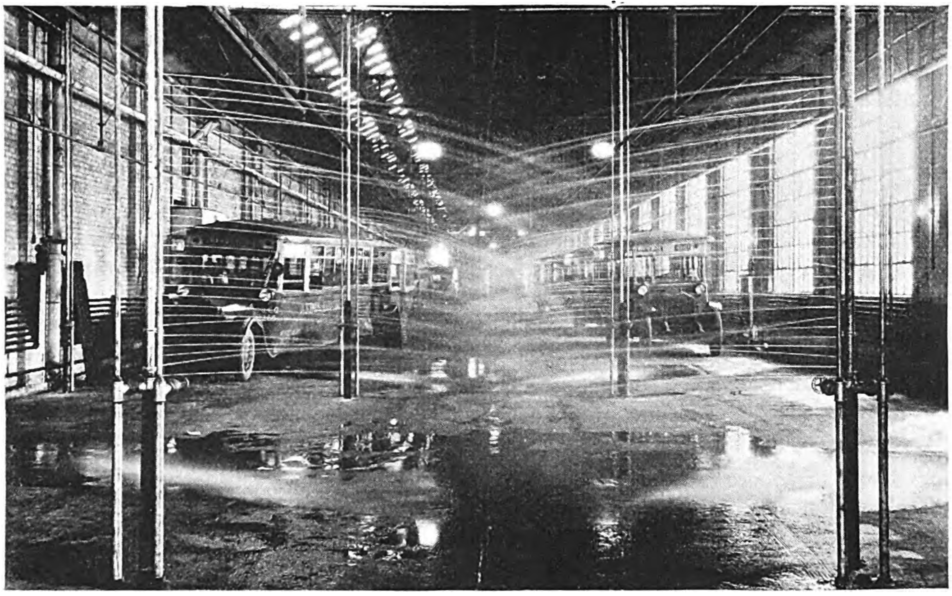
Convenient First Aid Packet

ONE of the interesting exhibits at the joint session of the Southwestern Geographic Division of the National Electric Light Association and the Southwestern Public Service Association held in New Orleans April 26 to 29, inclusive, was a first aid packet recently adopted by the New Orleans Public Service, Inc. The packet is used on emergency trucks and its use will be extended to all electric cars of the company. The materials which are included and the arrangements of the packet were originated by one of the department heads of the railway.

FIRST AID PACKET
Vaseline
WHITE
GAUZE BANDAGE
ROOM

Assortment of first aid material included in packet as used by the New Orleans Public Service, Inc. Instructions for use are included inside the cover

The various materials are included in a tin container which is absolutely dust and moisture proof. Particular attention has been given to the selection of materials so that they will provide everything necessary for first aid treatment of minor accidents and still not include any needless material or material which will be used infrequently. The packet contains two 2-in. bandages, one No. 2 tube of white vaseline, 1 yd. of plain gauze, one package of three swabs of mercurochrome, one yard of 1-in. adhesive plaster and a pair of surgeon's scissors. The total cost of the packet as furnished the railway is $1.16.



Arrangement of pipes for spraying buses

Keeping Cars Attractive at Small Cost

Frequent painting, use of spray methods where possible, efficient apparatus so that cars can be washed daily and a definite program to adopt improved devices have produced good results in Akron

By Pierre V. C. See

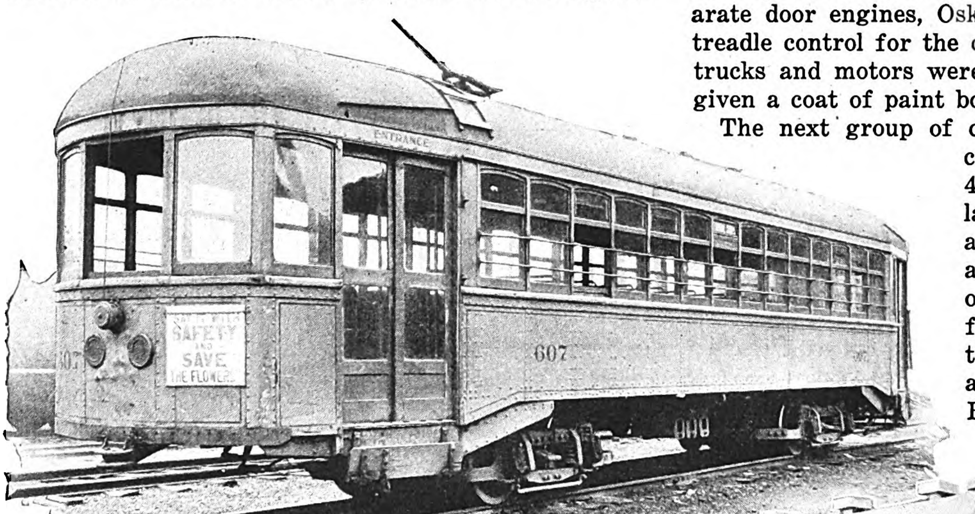
Superintendent of Equipment Northern Ohio Power & Light Company
Akron, Ohio

MEN of any railway directly responsible for the maintenance of rolling stock are anxious to keep the equipment in the best possible shape and running smoothly. They realize that clean, well-painted cars are a necessity, but when the management finds it desirable to reduce the budget usually the first expenditures cut are those for painting and cleaning. The theory seems to be that a car will run just as well clean or dirty. However, in this the sales value of attractive rolling stock is not considered. This tendency to pare down expenditures for painting and cleaning results in the mechanical department having but a very limited amount of money to spend for this work. So in order that the entire equipment may appear at its best it is necessary to study the situation carefully and to do the work on each car as cheaply as possible so that all cars may be kept in about equal condition and in as good shape regarding painting and cleaning as the money will allow.

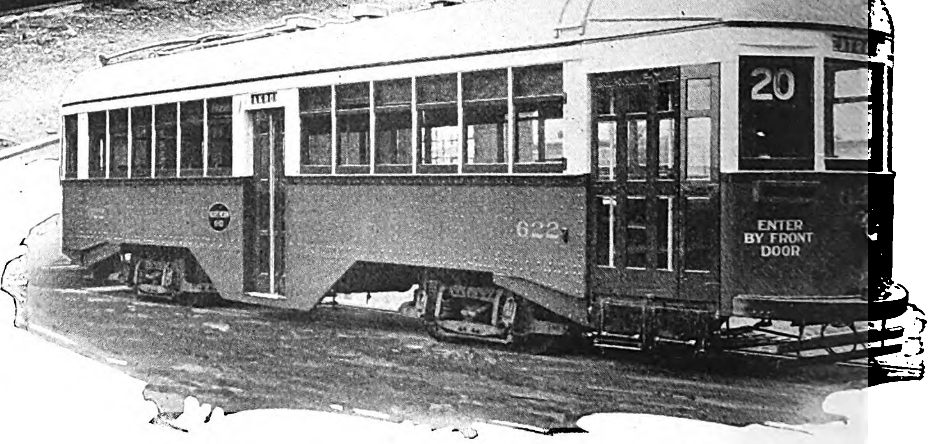
Passing a bus through the spray in its daily washing

Paint does not get the close scrutiny on cars that it does on automobiles, pianos or house furniture. Cars are usually viewed by people from the sidewalks and small defects are not noticeable. Foremen painters should be taught that while they may wish to turn out a highly creditable, well-finished piece of work the management considers such an expenditure unwarranted. The foreman painter must be trained not to remove sound paint from a car being refinished just because it is chipped or broken in places. A coat must be applied over the old paint and no time should be wasted in puttying operations, glazing or sanding small spots and crevices. Of course all rust and scale must be removed and bare spots primed properly.

Spray methods of painting should be used as far as practicable. For frequent repainting of cars it is unnecessary to remove the sash if the spray is used only for the flat surfaces below the belt rail. In an economy campaign the painting of parts which necessitates the installation of guards or extreme precautions to keep paint from adjacent parts does not appear advisable. The practice of spray painting trucks frequently might also be questioned as the cleaning off of trucks and the spraying keep them looking fresh for but a few days. The use of transfer numbers, letters and monograms often results in a very considerable saving on the year's painting cost.



One of the double platform cars before remodeling



Remodeled car provided with center door

Where the allowance for car cleaning is limited and the number of cleaners has to be kept as low as possible, some efficient type of water spray system will be found of advantage. The usual method is to install this either at the entrance to a shop or at some point in the yard where the cars can be brought through the spray without undue switching. With an effective system two men can make a very creditable showing in the cleaning off of the outside and windows of cars with a very small expenditure.

An accompanying line drawing shows the car and bus washing system as laid out at the Kenmore shops of the Northern Ohio Power & Light Company. Two other illustrations show the equipment as installed. The practice at Akron is first to wet the car thoroughly by the spray and then to have one man on each side rub the parts with a brush. The car is then passed slowly through the spray a second time for rinsing.

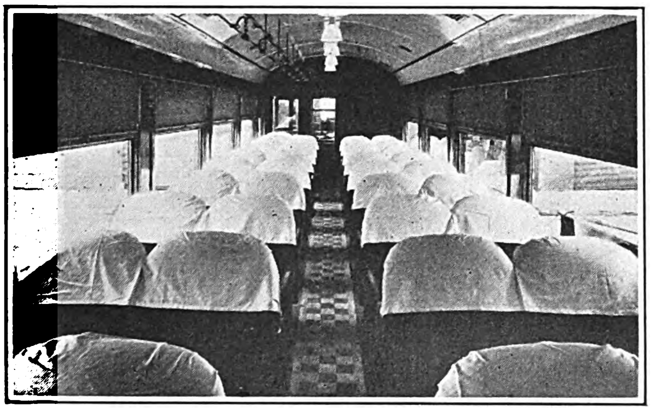
Conforming with the present movement throughout the electric railway industry to provide more attractive rolling stock with greater comfort and conveniences, the Northern Ohio Power & Light Company during the past year started a campaign to get all of the equipment which it operates into as good condition as possible without undue expenditure of money. This campaign not only included the improvement of appearance and addition of comforts in cars, but also provided for economies and improvements in operation. It was planned to complete the work of car rehabilitation by March, 1927. Some of the improvements which have been incorporated are given.

At present 74 Peter Witt center-door cars are used for operation in the city of Akron. These cars are all of a steel, semi-lightweight modern type. In the remodeling program these cars were converted for one-man operation by the addition of safety appliances, separate door engines, Oskelite equipment and automatic treadle control for the center door. At the same time trucks and motors were overhauled and each car was given a coat of paint both inside and out.

The next group of cars on which remodeling was carried out included a series of 41 composite city cars with very large rear platforms. The cars are fifteen years old, but they are well built and in a good state of preservation. It was therefore felt advisable to rebuild them rather than to scrap them and purchase new equipment. For the sake of uniformity, it appeared most desirable to make them as nearly as possible like the Peter Witt cars so that there would be less confusion on the part of passengers where both types of cars were used. With this group of cars the front-entrance door was enlarged by moving the corner post forward and by taking away the panel between the door and car body so as to make a comfortable entrance. An emergency exit was provided and arranged for operation by a separate door engine. Full safety devices and all other appliances as used in the Peter Witt cars were installed. A center door was cut in the side of the car. As the floor of this type was higher than in the Peter Witt cars it was necessary to use three steps. All the steps were arranged to act as treadles for controlling the door. The long rear platform was cut off 3 ft. and was buil up level with the rest of the car. A circular seat wa then installed around the rear end. The rattan seat with which the car was equipped were padded thoroughly and covered with imitation leather. Inside and outside were painted carefully and the ceilings were given a high gloss white enamel.

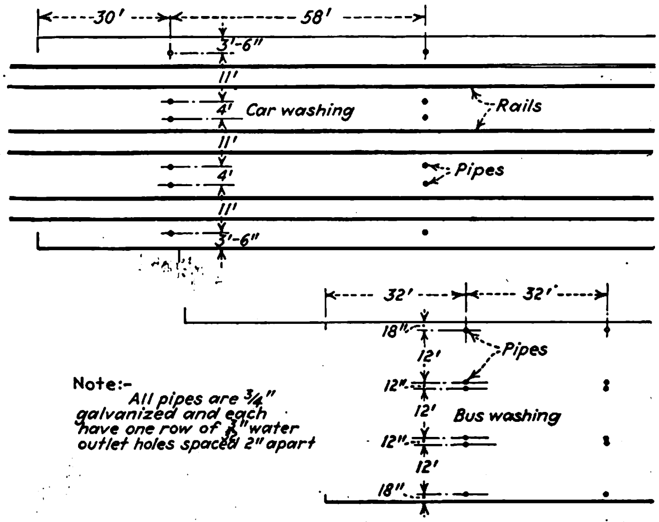
While this body work was being done the trucks were overhauled, the gear ratio of the motors was reduced and helical gears were installed. In rehabilitating the motors the bearings were welded electrically and rebored. New housings and bearings were installed where necessary. With this change in equipment the car was provided with a faster pick-up and much quieter operation.

In Canton the Peter Witt cars have been equipped in the same way except that the treadles were not installed as the service was much lighter and treadles were not deemed necessary. Other cars used in the Canton service are of steel. These were converted for one-man operation by building up the rear platform and remodeling the front vestibule similar to the cars in Akron. Each car was painted during the process of alteration.



Interior arrangement of seats in chair car with linen covers

The interurban cars operated by the Northern Ohio Power & Light Company were given either a coat of varnish or a coat of color varnish and varnish, depending upon their condition. The interiors were freshened up with white enamel. As an experiment two cars were arranged for the installation of chairs. One of these was shown at the American Electric Railway Association convention in Cleveland last October. These chair cars have been running since the convention in regular service and very favorable comment has been received.



Arrangement of wash tracks at Kenmore shops

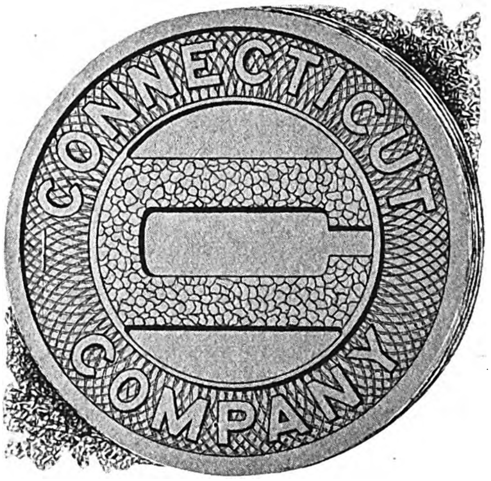
The campaign for better appearing cars has also been applied to the freight equipment operated by this company. Most of the freight cars have now been sprayed with paint so as to present an attractive appearance.

Clean and Beautiful Station Surroundings Win Awards

MINDALE and Union, stations on the northern division of the Illinois Traction System between Peoria and Springfield, Ill., have been awarded the grand prize for the best kept stations and grounds on the entire main division of this line. The grand prize was awarded to both because of the excellence of the conditions at both stations. The first prize of $35, the second of $25 and the grand prize of $65 were added together, and the total divided between these two stations. Third prize on the northern division goes to Danvers. On the central division, Harristown carried off first prize, on the eastern division Fithian, while on the southern division Gillespie was first. It was at the request of D. W. Snyder, Jr., vice-president of the Illinois Traction, that an inspection of the stations was made and recommendations for awards forwarded to him.

Where Connecticut Tokens Go

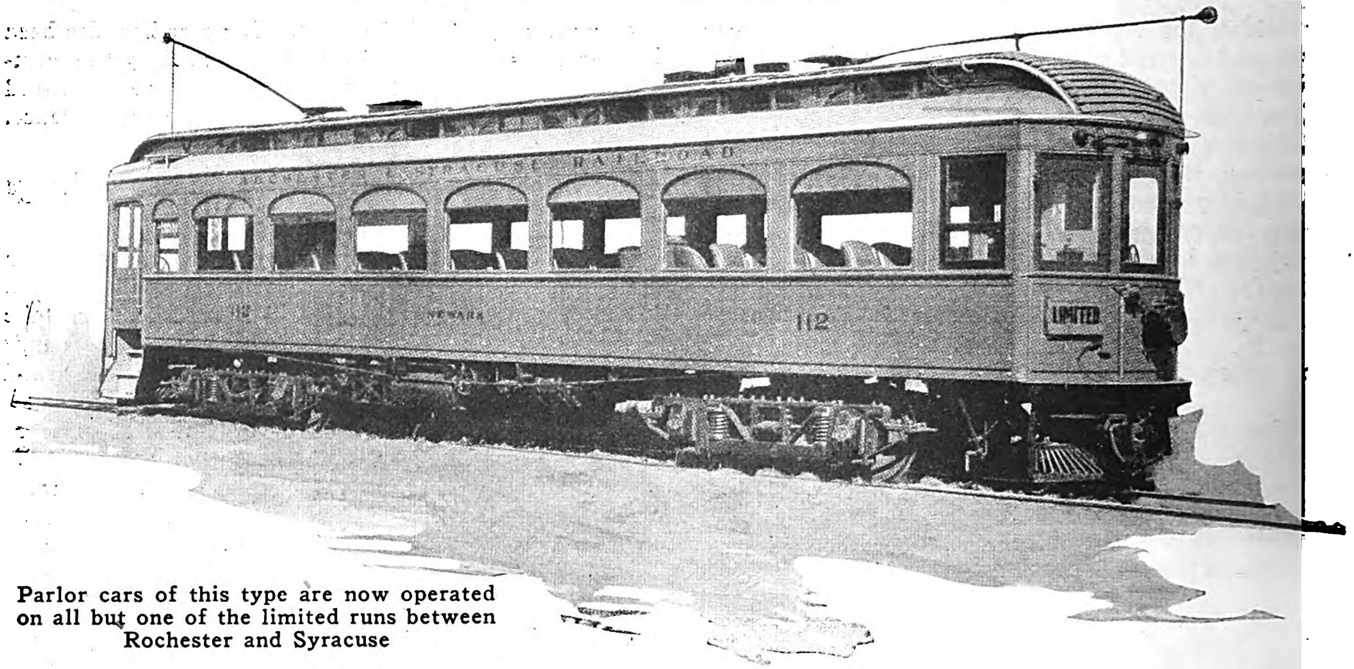
FACTS about the street railway are told in a booklet distributed by the Connecticut Company at the recent progress exposition held at New Haven. A historical sketch is given of the organization and development of the transportation system, and a statement of how the company's revenue is spent. To emphasize this the booklet has been made circular in shape, with covers that resemble a token, as shown in the accompanying illustration. Distribution of expenditures was shown as follows:



Booklet giving information concerning the Connecticut Company, made up to resemble a trolley token

Wages	$7,800,000
Supplies	1,500,000
Coal	600,000
Purchased power	600,000
Contract work	500,000
Accident claims	360,000
Taxes	490,000
Interest	400,000
Dividends	None

This booklet proved extremely interesting to the public, as indicated by the small number which were discarded.



Parlor cars of this type are now operated on all but one of the limited runs between Rochester and Syracuse

Rochester & Syracuse Cars Made More Attractive

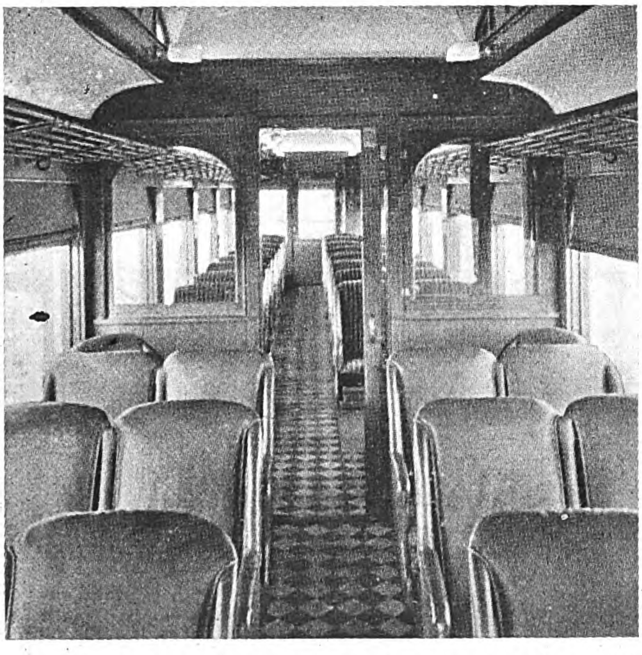
FIVE cars in limited service on the Rochester & Syracuse Railroad recently have been refitted with the object of making them more attractive to passengers and thereby encouraging riding. The car bodies are not new, but were completely rebuilt in 1923, and have been refinished. They are of the semi-steel type. Trucks have been thoroughly overhauled so as to improve greatly their riding qualities.

It is in the interior, however, that the greatest improvement has been made. In the main compartment the chairs are finished in leather and striped velour and are arranged in pairs on one side of the aisle with single chairs on the other. At the ends are other single chairs. In the smoking compartment the chairs are finished in leather and are arranged in pairs on each side with single chairs at one end. All chairs are deeply cushioned with heavily padded backs.

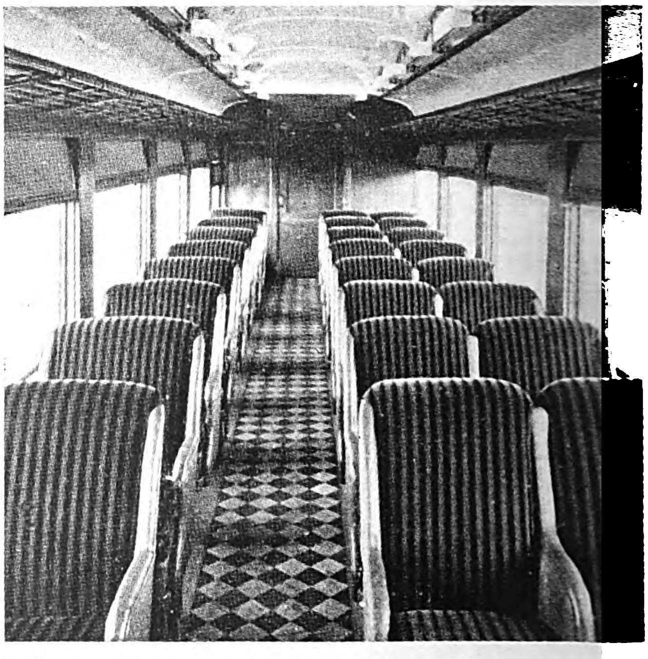
Five-foot plate glass windows materially improve the visibility and add to the attractive appearance of the car. The lighting system has been much improved by the installation of frosted bulbs and artistic shades. New baggage racks have been installed. The interior is finished in a soft dark gray color, harmonizing well with the gray leather and maroon gray striped velour chair covers.

The floorcovering is of rubber tile. This has had an important effect in reducing noise. Other noise has been eliminated by doing away with fare register apparatus, swinging bell cords, etc.

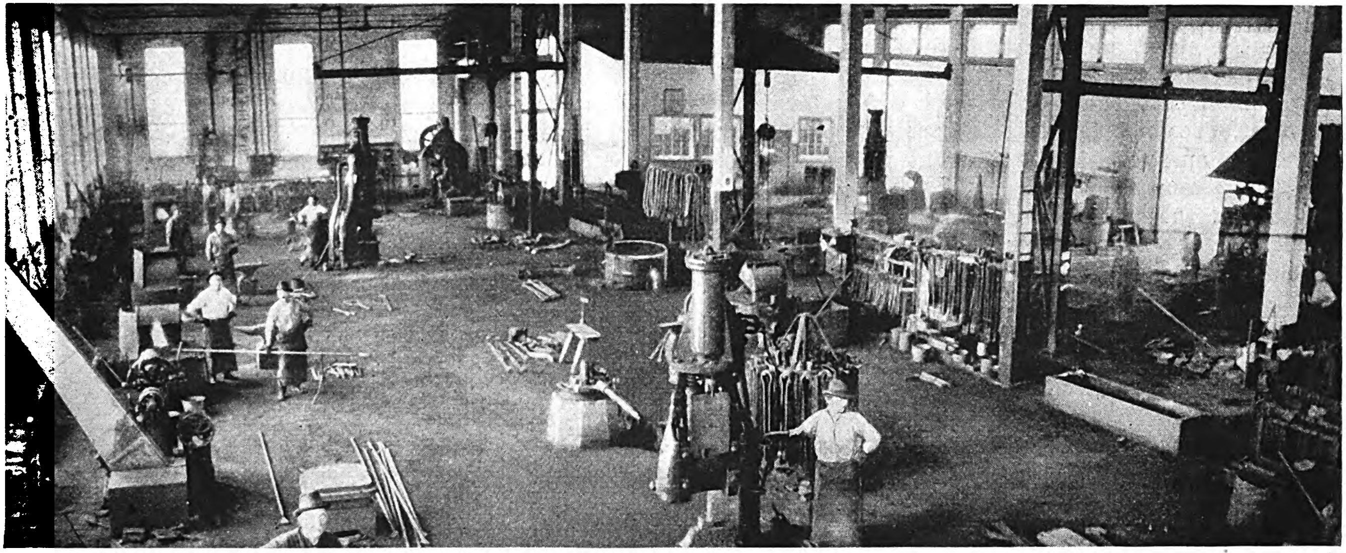
The first car was completed and put in service during the latter part of February.



In the smoking compartment the seats are upholstered in leather and are arranged in pairs on both sides of the aisle



In the main compartment seats upholstered in maroon and gray striped velour are arranged in pairs on one side of the aisle and singly on the opposite side



The walls of the blacksmith shop are sprayed periodically with white paint so as to give a clean appearance

Los Angeles Railway Shops Modernized

Machine tools have been changed over to individual motor drive and modern switching equipment has been installed. Particular attention has been given to provide a light, neat shop

AN EXCELLENT example of how an existing shop can be modernized is to be found at Los Angeles, Cal., where the railway company has in the last few years reconstructed its shops to a point where they compare favorably with plants built within the last few years. All machine tools, both in the machine shop, woodworking department and truck group, have been converted from belt drive to individual electric drive. The various departments have been spread out, for which purpose the shop buildings have been increased in size and new sections have been added.

All of this modernization of shop equipment has had its effect on the reduction of the cost per mile for maintaining the 750 cars of the system. As a result many improvements have been made in the rolling stock itself, since it is now possible to do this at a cost which makes it practical and economical.

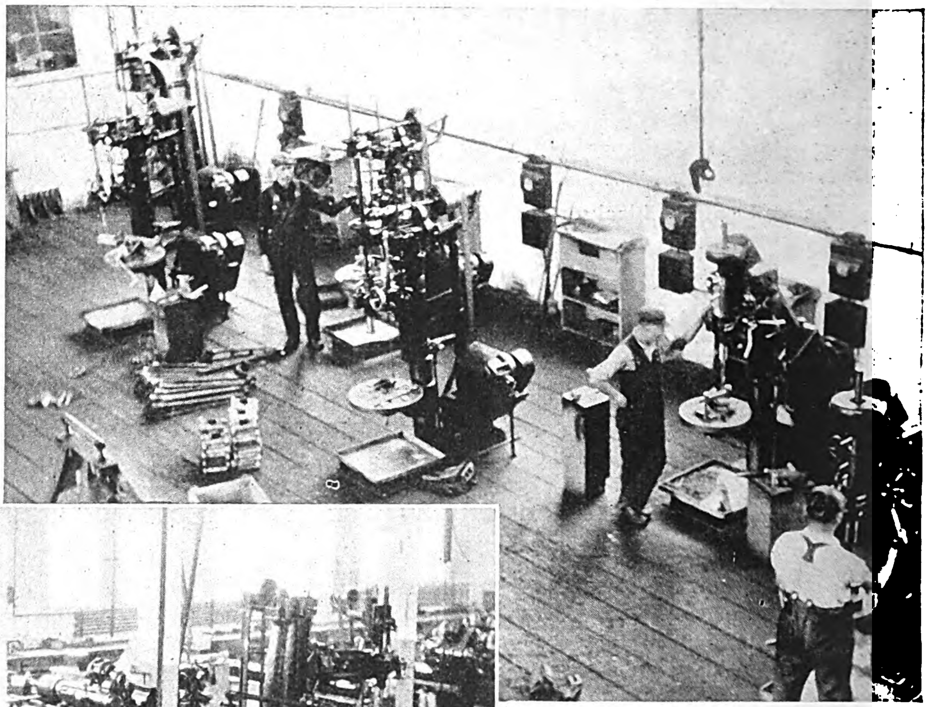
The armature and electrical department of the Los Angeles Railway is clean and orderly with an abundance of air and light. In this department are handled armature rewinding, field coil rebuilding, dipping and baking of armatures and other phases of electrical maintenance.

The armature and electrical department of the Los Angeles Railway affords an example of cleanliness and orderliness

The blacksmith shop of a railway is usually the skeleton in the closet and as a rule does not lend itself to inspection by outsiders as an example of orderliness and cleanliness. The shop at the Los Angeles Railway, however, does not fall into this category. The walls have been sprayed with white paint and are kept clean by going over them periodically. The floor is swept clean, and the hand tools and materials are kept in order. Heavy steam hammers, bulldozers and cut-off machines are part of the mechanical equipment. Everything is available in the way of tools and machinery for complete construction of body and truck frames, and if necessary the company could build its own complete cars.

A portion of the machine tool room is fitted with lathes, drills and other pieces of equipment. This company has two porters on duty at all times washing the shop windows, which permits the large glazed areas to be utilized to full advantage.

Because of the large floor space available one room has been devoted entirely to drill presses and in this all of the drilling work for the system is performed. The arrangement of the individual motor-driven drills along the glazed side walls forms a striking feature. Fuse and switch boxes are installed on the walls, 440-volt, three-phase alternating-current power being used for all shop drives.



One room is devoted entirely to drill presses for this class of work

The machine tool room is provided with a large glazed wall, insuring ample light

Crossing Accidents in Milwaukee Reduced

NOTABLE success has been achieved by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., by reducing crossing accidents through the introduction and operation of flashing red light signals hung over intersections along electric railway lines, warning motorists that there is a street car crossing at that point. The warning lights were installed in 1925. Previous to their installation accidents in which street cars figured averaged 7.7 per month on 100 crossings. Today, with about 400 of these signal lights in use throughout the city, the accident curve at crossings has fallen off about 36 per cent, or about 4.9 accidents per month on 100 crossings. These beacons of safety, which flash a danger signal 30 times a minute, are one of the company's own creations. The equipment used for this purpose is produced in its shops.

$1,823 in Sick Benefits at Buffalo

APPROXIMATELY $1,823 was paid to members of the International Railway Co-operative Association, Buffalo, N. Y., in sick benefits in 1926. Two pension applications were also approved by the Co-operative Association, each member of which is insured for $1,000. About $13,000 was paid to families of members who died during the year. This information was contained in a report of George L. Burgain, retiring president of the Co-operative Association, showing that 99.68 per cent of all eligible employees were enrolled. The report also shows that employees of the company have an investment in bonds and stocks totaling $2,160,400 par value, plus $50,000 par value investment of the association. The co-operative saving fund now numbers 1,000 depositors, their deposits totaling about $100,000.

The association elected William E. Murphy, chief dispatcher and a director of the company, president of the employees' organization. Mr. Murphy had been vice-president and in September, 1926, was elected to the board of directors of the company. The vice-presidency of the employees' organization will be filled by H. P. Lesswing of the power and line department.

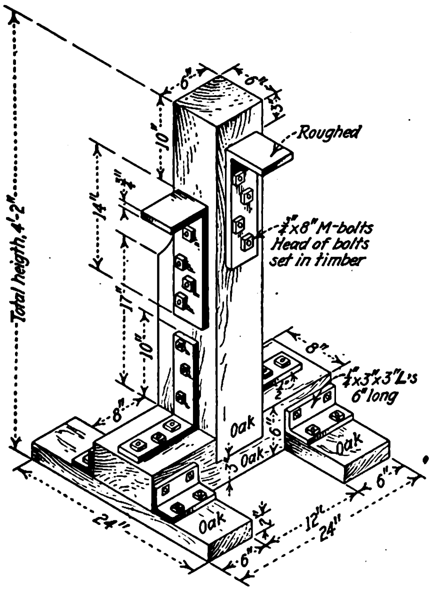
Capitalize Your Experience

See the Maintenance Competition announcement on page 1048.

Maintenance Notes

Convenient Support for Car Body

SATISFACTORY support for a car body while the trucks are removed and undergoing repairs is a problem that has been solved in the shops of the New Brunswick Power Company, St. John, N. B. With the old method of using steel drums with improvised cross-members such as track rails, timbers and blocking for supporting car bodies considerable inconvenience and difficulty were experienced. The steel supports on which the sills of the car rest are arranged at different heights on two sides of the upright, so as to provide for different conditions. The base is made of oak timbers 2 ft. long by 6 in. x 2 in. A cross-timber provides the support for the upright, which has a total height of 4 ft. 2 in. L-shaped steel braces reinforce all intersections. This type of support provides increased flexibility for height and is of particular convenience for workmen to work around. When not in use the stands can be stored in a very small space.



Car supports as used by the New Brunswick Power Company

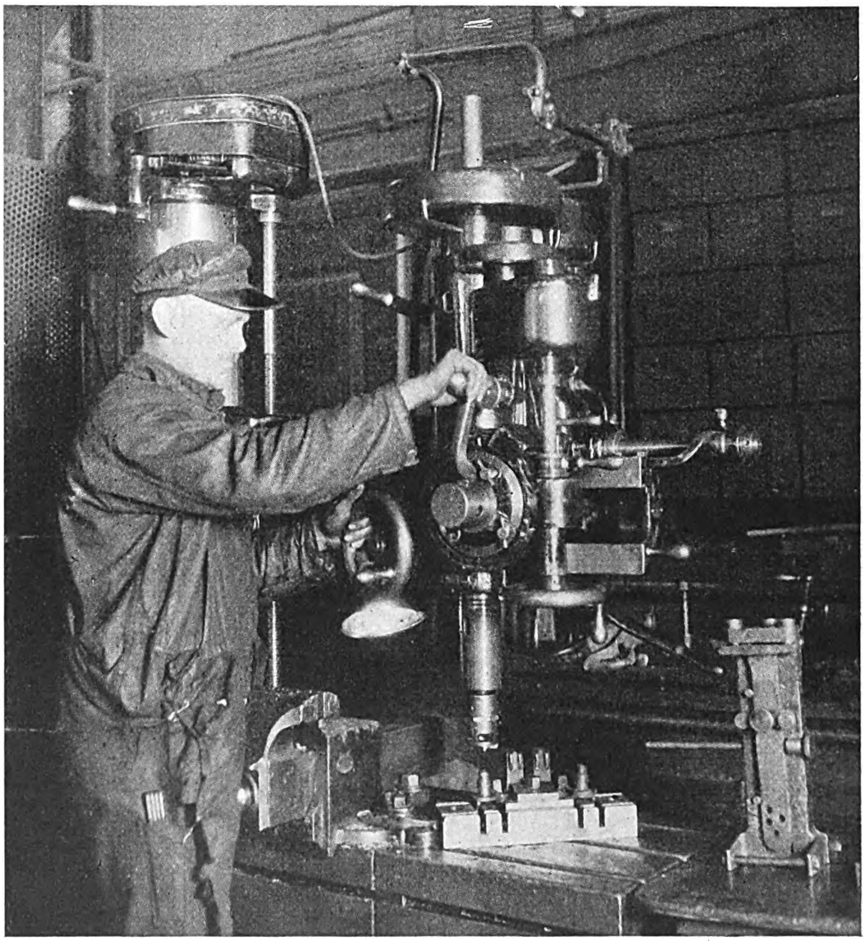
Four of these are used for each car set. Their total weight is but 130 lb., which makes handling easy. The practice of the New Brunswick Power Company is to paint these supports a bright red, which gives them high visibility, and also suggests to the workmen that they should be used with care. The iron work is painted black.

Triple Baking Prolongs Armature Life

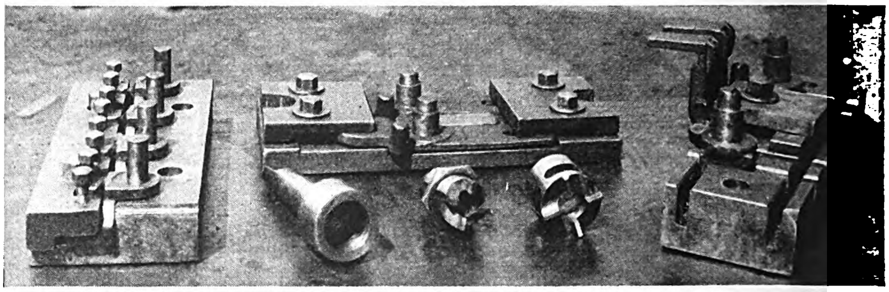
FAILURE of armatures and field coils on the cars of the Atlantic City & Shore Railroad, Atlantic City, N. J., have been greatly reduced in recent years since the adoption of dipping and baking. A feature of this process on which much stress is laid by J. W. Gordon, master mechanic, is that it is carried out three times. When a motor is overhauled, the armature and all field coils are removed and heated in oven to 170 deg., then dipped in Chinalac for 30 minutes. They are then baked at a temperature of 170 deg. F. for four hours. After that they are again submerged and baked for the same period. The process is repeated once again before they are replaced in the motor case.

A Duplex Hollow Mill

FOR facing two shoulders and turning two bodies to different diameters at the same time a duplex hollow mill designed and constructed by the shop men is used in the 39th Street repair shops of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. It has a variety of uses, such as the machining of lugs on bell cranks and brackets used for the gates of elevated cars. The cranks and brackets are of unusual shape and are very troublesome to machine, if held in an ordinary lathe chuck. An accompanying illustration shows several



Finishing gate castings with duplex hollow mill of these gate brackets set up in a jig which holds them in position for machining, which is done with the hollow mill. In addition to facing off two shoulders of these castings, the upper portion has to be turned to a diameter of ¾ in. and the lower section to a diameter of 1 in. The tool has cutting surfaces so that all of these parts are finished in one operation.



The three parts of the mill are shown in the center, while jigs holding castings to be finished are shown at either side and in the background

The duplex hollow mill is thus four tools in one, two of which are used to finish the faces of the shoulders and the others to turn the round sections. The mill is made in three parts. One, shown at the left in the illustration, forms a holder for the two others and can be placed in a drill press in the same manner as a taper drill. The two other parts fit into the holder, one passing over the other. The center part slides onto the holder and is held from rotating by a key. The part at the right fits into the center part and has a keyway and set screw for fastening. The nut which may be seen on the center part regulates the distance with which the cutting edges are held apart. Means are also provided for longitudinal adjustment of the cutting edges so that grinding may not interfere with the desired setting of the tool.

It will be appreciated that with this kind of hollow mill, with the jigs shown, the time for doing the work is decreased enormously and also when the castings are machined an accurate fit is obtained and the various castings are uniform so that they are interchangeable.

A Winner

Announced Next Week

First	$200
Second	$100
Third	$ 50

Monthly Prize
$25

THE first monthly prize winner in the maintenance competition will be announced in next week's issue of ELECTRIC RAILWAY JOURNAL, dated June 18. The second installment of articles submitted in the contest will also appear. This competition is attracting widespread interest, and winners of the various prizes can feel proud of the distinction of having submitted a winning idea. All material received has been of a particularly high grade and the practices described are saving money for the railway properties which use them. The prominence given to such time and labor-saving methods or devices is sure to result in increased use and also to the development of similar practices which will prove of benefit to the systems on which they originate.

Many general managers have recognized the value to their men of these glimpses of successful practices that ELECTRIC RAILWAY JOURNAL is giving in its Maintenance Data Sheet section. They see that the descriptions get to the men who can profit most and so improve their own maintenance methods. They also see that they are filed properly so as to be available at all times and so constitute a Bible of Maintenance Methods. Heads of maintenance departments are also encouraging their men to submit ideas that can be sent in for the prizes.

One railway official wrote:

"I have interested all of our maintenance departments in this competition, with the understanding that any money received as payment for the articles or as prizes will go into a jackpot fund for an open-house inspection and celebration some time later."

Condensed Rules for the Contest

Any employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month. The first group of articles submitted was published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL for May 21, 1927.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made.

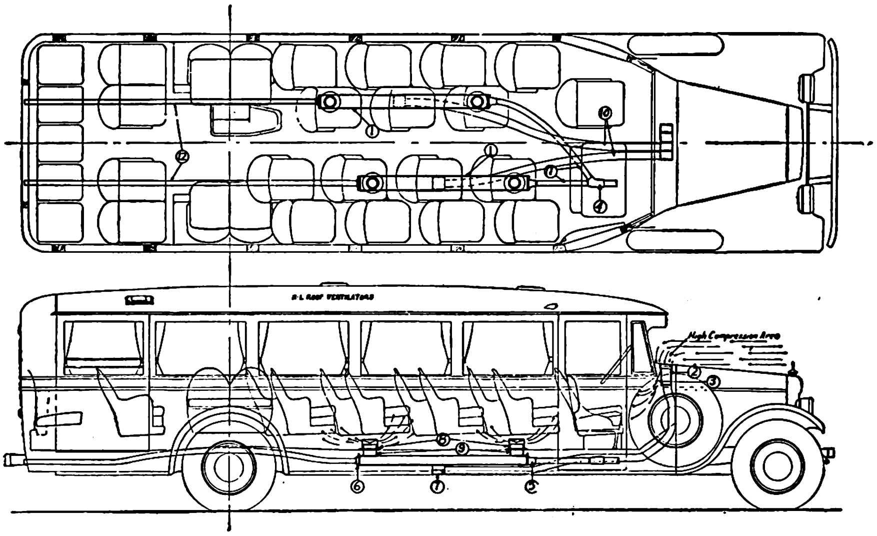
The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

New Equipment Available

Venti-Duct Heater

AMONG the advantages claimed for the N-L Venti-Duct heater recently placed on the market by the Nichols-Lintern Company, Cleveland, Ohio, are that a sufficient amount of heat is provided at zero temperature to make the coach comfortable at any speed; that increased ventilation is produced with even temperature throughout the coach; that fire hazards are eliminated; that obnoxious gases are avoided and the cleaning problem is reduced.



Circulation of air with new Venti-Duct heater

An all-weather cowl ventilator collects the air at high velocity and pressure at a point that insures against contamination from the engine. The force available gives a maximum heating effect. The highest degree of cooling of the cowl is provided as it operates regardless of weather conditions. This ventilator for the bus cowl was described in ELECTRIC RAILWAY JOURNAL for Dec. 4, 1926, page 1014.

Air passes to the heaters through a 3-in. flexible tube or its equivalent. It divides at this point and passes along the heater tubes in both directions. At each end of the heating chamber is an opening into the body having a diameter of 5½ in.

The exhaust line is split with a heavy cast Y and the exhaust is carried to the heater with a minimum of turns. As the heater is used as a muffler, exhaust heater valves and mufflers are eliminated. The outer casing of the heater is constructed of No. 20 gage cold-rolled steel. The exhaust passes through 1-in. seamless steel tubing brazed into heavy steel headers. The exhaust on passing through these tubes is cooled rapidly by the air passing over them and then passes out of the heaters to the rear of the coach.

Development in Two-Pole Switches

TWO-POLE switches with solid neutral block for use on three-wire grounded systems have just been developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., in sizes running from 30 to 600 amp. This design of switch provides an economic arrangement to utilize the advantages of reduced size made possible by using solid neutral without the third switch blade, the size being reduced to that of a standard two-wire switch.

The 30-amp. size switch is of the "00" type, the 60, 100 and 200-amp. sizes of the WK-62 type and the 400 and 600-amp. sizes of the WK-60 type. All the types up to 200 amp. may be supplied with end or removable end adapted to a meter trip when it is desired to mount the meter in conjunction with the switch.

"Eventually, Why Not Now"
Use heat-treated bolts.

Boom Extension for Railway Ditching Machine

BECAUSE the railway ditching machine of the American Hoist & Derrick Company, St. Paul, Minn., is used extensively as a crane for handling rails and other materials, the makers have introduced a boom extension to facilitate handling of the 39-ft. rails now laid by a number of railways. This boom extension is composed of two 10-in., 20-lb. steel channels, 9 ft. long, braced with angles and channels. Beyond the main boom the 9-ft. channels are inclined together so as to give the proper clearance for the end sheave. After the dipper handle has been removed, the extension is bolted to the underside of the main boom, the attachment being arranged to provide for ready placing and removal.

This machine, whether used as a ditcher or crane, travels on a portable track on the floor of a flat car.

The boom extension facilitates handling of 39-ft. rails

Association News & Discussions

Winnipeg Welcomes Canadians

Enthusiastic Three-Day Meeting Held by C.E.R.A. Includes Many Operating and Maintenance Subjects

WINNIPEG, the capital of Manitoba and the midwestern metropolis of Canada, provided a right royal welcome for the Canadian Electric Railway Association last week. As guests of the Winnipeg Electric Company, the most representative body of operators assembled in the 23 years life of the association. Three morning sessions were held, on Tuesday, Wednesday and Thursday, May 31, June 1 and 2, followed by luncheons at which topics of interest to the members were presented. The afternoons were devoted to inspection of exhibits. On Tuesday and Wednesday evenings dinner dances were held at the Fort Garry Hotel. A total of nearly 200 members and guests were registered.

Tuesday morning's session was devoted to routine business and reports of committees. Four companies, the Newfoundland Light & Power Company, the Edmonton Radial Railway, the Saskatoon Municipal Railway and the Calgary Municipal Railway, were elected to membership, bringing the total up to 36 companies.

In his opening address President W. R. Robertson presented statistics showing the vastness of the empire and indicating the magnitude of the transportation problem. "In Canada today," he said, "we have more than 2,500 miles of electric railway, more than 40,000 miles of steam railway, 470 miles of canals and more than 210,000 miles of highways. Of the highways 25,265 miles are graded, more than 48,000 miles are gravel, more than 4,000 miles are macadam and more than 3,500 miles are paved. It is estimated that the investment in highways is in the neighborhood of $600,000,000 to $800,000,000.

"The investment in motor vehicles and horse-drawn vehicles is estimated in the neighborhood of $2,000,000,000, in steam railways $3,500,000.000 and in electric railways $221,769,000. The electric railways are carrying in the neighborhood of 725,000,000 passengers per year, or nearly double the number carried by all the other facilities. These figures show that in a country such as Canada, with its vast distances and its comparatively small population, there is a transportation problem faced by few other countries in the world today.

"The bus," said Mr. Robertson, "is having its field more clearly defined each year. While it is more apparent each day that up to the present time there is nothing which approaches the trolley car in over-all efficiency for the handling of mass transportation, the industry is waking up to the fact that the scope of its work is not confined alone to the operation of trolley cars, but also embraces many other fields of transportation, which formerly were either unserved or left to the haphazard control of small agencies.

"Notwithstanding that the ownership of motor cars in Canada has grown from 6,000 in 1910 to more than 820,000 in 1926, coincident with this growth electric railway revenue has increased from $17,000,000 to more than $50,000,000. Only two companies out of the 39 in Canada report a smaller revenue in 1926 than in 1925, although we have had to compete with jitneys, buses and trucks. There has been industrial depression and very small increase in population; in fact, many of the older sections show decreases. This situation justifies us in having the utmost faith in our industry."

Committees Present Reports

Discussion of committee reports showed the great interest being taken in many of the problems of today.

The report of the motor bus and truck committee, read by Mayor F. D. Burpee, Ottawa, in the absence of Chairman I. S. Fairty, stated that replies to questionnaires indicate that there have been few instances of actual discontinuance of bus routes, while on the other hand a substantial number of new routes have been established, and on the whole there is little bus competition with Canadian street railway lines. From 94 buses used by railway companies in 1925 the number increased to 202 last year. Many of the member companies have entered the local sightseeing business, with apparent financial advantage. This class of business coordinates well with other local services, giving employment to men and vehicles in off-peak hours.

"It is becoming more and more apparent," states the report, "that the operation of automotive vehicles by the transportation agency of any given area should not be confined strictly to the geographical boundaries of such area. For the street railway system to sit weakly by while others pre-empt all profitable interurban or suburban routes spells disaster in the long run. It involves a constantly increasing loss of local fares to such through-running buses, the creation of a network of outside franchises stifling and forbidding the normal growth and development of the local system, the occupancy by others of a field logically belonging to such system and necessary to the economical development of its urban services, and a substantial and pronounced loss of prestige and local favor."

A. H. Foster, Brantford, chairman of the committee on publicity and merchandising transportation, presented the report. This committee is preparing and disseminating information regarding electric railways along lines parallel with the American Association. Files are being built up by the secretary which will make available much valuable material hitherto unobtainable.

M. W. Wales, Winnipeg, read the report of the committee on rail corrugation for Chairman C. R. Kinnear. Tests are being made in conjunction with the corresponding committee of the American Electric Railway Engineering Association. In view of the lack of a solution the committee proposes remedial measures such as rail grinding. An abstract of the report will appear in a forthcoming issue.

Accident Prevention

W. R. McRae, Toronto, chairman, presented the report of the committee on safety and accident prevention. The apparent lack of interest in this subject was deplored.

A lively discussion followed. Mr. Robertson pointed out that the proportion of accidents increases with the car-miles operated, being most serious in the larger cities. Licensing of automobile drivers he feels is a means of reducing accidents. No person should be allowed to drive unless physically qualified.

That the one-man car has proved safer than the two-man car, due to the safety devices and undivided responsibility, was the evidence of the various speakers. Several roads have not yet had a single accident with the treadle door.

J. Metcalfe, Toronto, stated that the reduction in accidents on his system in the past six years has alone been sufficient to pay interest on the investment in safety car devices. In Toronto, he stated, every possible safety device is used. About 300 cars are run in the base hours and 900 in the rush. Of the latter total about 400 cars, including the trailers, are operated with one man. Treadle-operated one-man cars on this property number 150.

On this system it is not the practice to put a single safety car on a route to educate the public. A whole route is converted at once after preliminary advertising. A man rides the cars on the line and announces orally to the passengers the benefits of the new service.

It has been Mr. Metcalfe's experience that the treadle car with 80 to 90 passengers aboard will unload more quickly than any other type used in

America. No difficulty has been experienced when physically defective passengers alight.

C. H. Dahl, Winnipeg, stated that the boarding and alighting accidents on the treadle cars are far less than with other types operated in Winnipeg. An analysis has shown that 8 per cent of the trainmen are responsible for 25 per cent of the accidents. By eliminating some of these men the record has been much bettered.

D. E. Blair, Montreal, also stated that the treadle car is by far the safest of any type operated in that city. Treadle exits are used on 60 double-truck one-man cars and 100 trailers. Three or four slight accidents have been occasioned through the long flowing robes of nuns becoming caught, but there have been no injuries. In a few instances children have been caught when they were lifted off the treadle. No accidents have followed as the cars could not start.

R. M. Reade, Quebec, stated that accidents on one-man cars have virtually been eliminated. The accidents in Quebec average about one per 60,000 car-miles and the cost last year was 0.7 per cent of the gross revenue. The most dangerous accidents are collisions with automobiles turning out from the curb.

Mr. Robertson agreed with this last statement, based on his experience on the lines of the Ontario Hydro-Electric Power Commission. He also quoted figures based on results in the United States indicating that the one-man car is safer than the two-man car.

CAR MAINTENANCE RECEIVES ATTENTION

Wednesday's session opened with a lively discussion on car maintenance and noise reduction, led by Charles Comba, Calgary, and J. E. Watkins, Winnipeg. Mr. Watkins' paper will be published in a future issue.

Mr. Comba believes that spur gears are the greatest source of car noise. He insulates the gear cases by washers of leather webs.

Mr. Robertson states that he is obtaining an average of 100,000 miles from helical pinions. The gears probably will give 500,000 to 600,000 miles, although he has not as yet worn any out.

W. R. McRae, Toronto, agreed with Mr. Comba as to the noise of spur gears. He anticipates a life of 160,000 miles from helical pinions, although none have been removed. Major Burpee also is obtaining good results in Ottawa with helical gears.

J. F. Neild, Toronto, read a paper on the relative merits of various types of trolley wire. This is published elsewhere. With regard to life of wire, he stated that with a wheel pressure of 25 lb., No. 00 hard-drawn copper should be good for 3,000,000 wheel passes and tin bronze for 6,000,000 passes. Sag causes wear. In Toronto the practice is to stretch the wire as tightly as possible when it is strung in the coldest weather and let the sag come as it may in the summer.

E. V. Caton, Winnipeg, substantiated Mr. Neild's statements. The cadmium wire he has found to have a wear ratio of 1 to 1,654 in its favor as compared with hard-drawn copper.

A paper on economics in power distribution was prepared by A. J. Westman, Montreal. It was presented by A. S. Byrd in his absence. An abstract appears elsewhere. Manfred Freeman, Lethbridge, attested to the value of the mercury-arc rectifier, having the second one in Canada. Since it has been installed no trouble has been encountered, and the all-day efficiency has been increased from 50 per cent to 72 per cent. Mr. Byrd stated that the interference with telephones in Montreal has been eliminated and the telephone engineers are entirely satisfied with the use of the rectifier.

ENERGY-SAVING CAMPAIGNS SUCCESSFUL

D. W. Houston, Regina, told of a campaign which has been in force on his property in the past three years with the idea of saving one-fourth of the energy. As a result of intensive effort, the average cost during the past three years has been $118,348, as against $174,698 the year before the campaign was begun, a saving of 32 per cent.

Major Burpee stated that in Ottawa he has had good results with the younger men, while the older ones are hard to get in line. The record of each man in comparison with the average in his class is handed to him with the semi-monthly pay check. In several instances the records made have been so good that the lines have been speeded up, while at the same time accidents have been reduced as the cars are easier to stop.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 13-16*—National Association of Cost Accountants, annual convention, Palmer House, Chicago, Ill.**

***June 15-16*—American Automobile Association, Motor Bus Division, Ritz Carlton Hotel, Philadelphia, Pa.**

***June 19-23*—International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

***June 20-24*—American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

***June 20-24* — American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

***June 24-25*—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

***June 29-July 1* — Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

***June 30-July 1* — Tramways and Light Railways Association, annual meeting, Bath, England.**

***July 22-23*—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

***July 27-29*—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

A bonus system was tried at first in Ottawa, but some of the men put energy saving ahead of service to the public. During the first year there was a saving of 10 per cent in energy with slightly increased car service. As a result of the campaign 10,000 car-hours have been saved by speeding up the lines.

FREIGHT HANDLING BRINGS EXTRA REVENUE

A paper on the benefits of freight handling was presented by T. H. Stoffel, Westinghouse Electric & Manufacturing Company. He pointed out that many opportunities exist for carrying light freight. By developing this business, which can be handled at low cost in addition to the passenger service, extra revenue can be obtained to offset losses in passenger service.

Mr. Robertson cited instances where the Hydro-Electric Railways have obtained extra revenue from freight and package haulage. Steam trains cannot handle this short-haul business economically, so that there is a considerable field for the electric line. On the other hand, trucks cannot move freight economically over 50 to 60 miles even at 100 per cent load.

W. H. Dinsmore, Vancouver, is using buses to pick up small parcels. He has also instituted a service with motorcycles. The business has now been developed to the point where it is the best paying department of the British Columbia Electric Railway.

DEVELOPING NEW SOURCES OF REVENUE

Much of Thursday's session was given over to the discussion of methods of increasing the miscellaneous revenues of a property, following a paper on this subject by W. H. Boyce, Pittsburgh, Pa. Mr. Boyce's paper is abstracted elsewhere. Mr. Robertson said in this connection that reductions in fare for certain specific conditions frequently bring in more revenue.

Mr. Dahl pointed out that the miscellaneous revenue is not a large proportion of the total. He feels that the high point in the Pittsburgh situation is the establishment of a commercial department. This is common practice with other utilities but rare with railways.

C. H. Clancy, Toronto, stated that a commercial department has been established by the Toronto Transportation Commission that is similar to the one described by Mr. Boyce. K. D. Miller, Toronto, feels that much can be accomplished in public relations by assuming that the passenger is always right.

Depreciation of motor buses was considered in a paper by D. E. Blair, Montreal, to appear in a future issue. W. A. Ernst, Grand River, also is of the opinion that a mileage basis for bus depreciation is to be preferred.

Mr. Dahl thinks operators have been too optimistic regarding bus depreciation. Eight years, he feels, is too great for present equipment. Five years, or a 200,000-mile basis, is to be preferred, and 300,000 miles probably represents a maximum performance. He also favors mileage as a basis of depreciation.

Zone fare systems for one-man cars were discussed in a paper by H. E. Weyman, Levis. Several speakers agreed that no perfect system has yet been devised for fare collection and that supervision is most essential.

John McNee, Vancouver, believes that there should be more co-ordination of the manufacturers in order to have an organization furnish cars complete. He feels that more attention should be given to regenerative braking, citing instances in England where it has been used advantageously. He is in favor of retiring obsolete equipment and believes that an investigation should be made of methods by which this may be done.

OFFICERS FOR THE ENSUING YEAR

Mayor Burpee, chairman of the nominating committee, presented the selections for next year's officers. The report was accepted and the officers elected unanimously, as follows:

Honorary president, A. W. McLimont, president and general manager Winnipeg Electric Company.

Honorary vice-president, Julian C. Smith, president Montreal Tramways.

Honorary advisory council: T. Ahearn, president Ottawa Electric Railway; Acton Burrows, president Acton Burrows, Ltd., and proprietor *Canadian Railway and Marine World;* Lt.-Col. J. E. Hutcheson, vice-president and general manager Montreal Tramways; George Kidd, president British Columbia Electric Railway; W. E. Phin, president Dominion Power & Transmission Company; A. E. Warren, vice-president Canadian National Electric Railways.

President, H. E. Weyman, manager Levis Tramways.

Vice-president, D. W. Harvey, general manager Toronto Transportation Commission.

Treasurer, H. C. Patten, comptroller Toronto Transportation Commission.

Auditor, J. E. Richards, manager and treasurer London & Port Stanley Railway.

Executive Committee: The president, the vice-president, the treasurer, the immediate past-president (W. R. Robertson, general superintendent Hydro-Electric Railways), and F. D. Burpee, vice-president and manager Ottawa Electric Railway; A. H. Foster, manager Brantford Municipal Railway; G. E. Waller, manager of railways Dominion Power & Transmission Company, Ltd.; L. Tait, manager and secretary-treasurer London Street Railway; D. E. Blair, general superintendent Montreal Tramways; W. S. Hart, vice-president Three Rivers Traction Company, and treasurer Quebec Light, Heat & Power Company; M. W. Kirkwood, general manager Grand River Railway; C. H. Dahl, assistant general manager Winnipeg Electric Company; D. W. Houston, superintendent Regina Municipal Railway; T. W. Brackenreid, manager Public Utilities Commission, city of Port Arthur.

Luncheon meetings were held on Tuesday and Wednesday at which important topics were considered. At the Tuesday luncheon addresses of welcome were given by Mayor Webb of Winnipeg and Mayor Swain of St. Boniface.

Labert St. Clair, advertising director of the American Electric Railway Association, was then introduced. He spoke on the need for co-operation and understanding between public officials and railway companies. Lack of it, he said, has caused a great deal of trouble.

At the Wednesday luncheon the speaker was C. W. Stocks, editor of *Bus Transportation.* He pointed out the need for a change in thinking by electric railway men, since the transportation business has become highly competitive. He outlined many ways in which electric railways can use buses to advantage without retiring the railway investment. An abstract of Mr. Stocks' talk will appear in a future issue.

Choice of Alloy Trolley Wires

By J. F. Neild

Electrical Engineer Toronto Transportation Commission

We are invited to discuss the relative merits of phosphor-bronze, hard-drawn copper and cadmium trolley wires. At first thought it would seem that their relative merits are competitive. I am not so sure, however, that they are altogether competitive. Rather they represent the efforts of the manufacturers to solve the various problems confronting the railway operators.

Hard-drawn copper may be thought of as the base line, from which to make all comparisons of trolley wire, first, because the widest experience has been had with it; second, because it has been definitely standardized, and third, because it has the lowest cost per pound. Our wide experience has proved there are conditions to be met where hard-drawn copper will not fill the bill, and with these I will deal later. The standard has been established for tensile strength from 47,000 lb. per square inch for 300,000 circ.mil wire to 54,500 lb. per square inch for No. 1/0 wire, all having a conductivity of approximately 97 per cent.

PHYSICAL PROPERTIES OF BRONZES

Bronze trolley wire may be of phosphor bronze, silicon bronze or cadmium bronze. For the moment consider the first two, which are really tin bronzes, a mixture of from ½ per cent to 1½ per cent of tin mixed with copper and deoxidized with phosphorus or silicon. The phosphorus or silicon is introduced as a part of the process of making the bronze rather than a part of the mixture. A little phosphorus or a little silicon may remain, but it still would be phosphor bronze or silicon bronze if none of the agent remained in the mixture.

For electrical purposes a little phosphorus remaining would reduce the conductivity more than a little silicon would. The strength and general properties depend almost entirely on the proportion of tin and the treatment given the material; in other words, the amount of drawing after the last anneal or after the hot-rolling process. These bronze wires are being standardized. Their properties are given in the accompanying table.

Cadmium bronze is a mixture of cadmium and copper or cadmium, tin and copper deoxidized with phosphorus, silicon or similar agent. The use of cadmium in place of all or part of the tin reduces the conductivity less than all tin does, yet it gives strength, hardness and other comparable qualities. Cadmium in an alloy with copper is more difficult to control than tin. It is not practicable to go quite so far with cadmium as with tin in obtaining high strength. These controls, however, are all in practical operation and the increased conductivity combined with strength widens its field of use.

SELECTION OF WIRE DEPENDS ON THE SERVICE

In selecting these various trolley wires for most efficient use, the question of what kind of wear they will be subject to and the service required must be known. Relatively few people seem to realize that any contact wire is subject to two distinct kinds of wear: First, mechanical, and, second, what might be called electrical wear. Mechanical wear is the frictional wear caused by the passage of the collecting device along the wire, while the electrical wear is the effect of the sparking and arcing between collector and wire. For withstanding the mechanical wear undoubtedly the harder alloys stand up the best, and so on down the list until hard-drawn copper is reached, but for electrical wear the reverse is true, as hard-drawn copper will stand up under sparking and arcing as well as any of the alloys, and a great deal better than some of the hard ones.

PROPERTIES OF COPPER AND BRONZE TROLLEY WIRES

Material	Tensile Strength, Lb. per Square Inch	Conductivity Per Cent
Hard-drawn copper	47,000-54,500	97
High-strength wire, silicon bronze or phosphor bronze	66,000-76,000	40
Medium strength wire, silicon bronze or phosphor bronze	59,000-68,000	65
Cadmium-copper	54,000-58,000	92
Cadmium-tin-copper	60,000-69,000	65-80

This shows the importance of knowing all the facts when making a comparison of the wear on trolley wires, as in some circumstances the hard alloy wire will show up extremely well, while under other conditions the same wire will perhaps fail to make a satisfactory showing. It is also necessary to have the wires at the same tension, as the wear undoubtedly increases with the sag between suspension points.

Looking at the question from service conditions, it would appear to me that the following would be the guiding lines in choosing the kind of trolley wire, though not by any means hard and fast rules, as the final choice is a matter of engineering judgment of the service required balanced against cost. For light to moderate traffic on long tangent lines, where the trolley wires are utilized as part of the feeder system, hard-drawn copper or cadmium bronze would appear to be first choice. For heavier service, with some grades or easy curves and with reinforcing feeders, the 92 per cent and 80 per cent conductivity cadmium bronzes and the 65 per cent conductivity tin bronzes would share the field. For intensive service, sharp curves, etc., backed up by heavy feeders, the 40 per cent conductivity tin bronze would compete and probably hold its own over the other types.

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*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

Another point to consider is that the harder alloys will not stand up under excessive short-circuit currents as will the softer alloys. They do not anneal and draw out, but actually break up into beads. The high tin and the high cadmium-tin wires will do this, while hard-drawn copper is not subject to the action.

It would appear, then, that it is not so much a question of the relative merits of the various kinds of trolley wire, but the proper utilization of them. Let me remind you that obtaining the proper wire for the job is only half the battle, as it must be properly installed and maintained. Any wire will crystallize under repeated hammer blows caused by the trolley wheel at hard spots in the suspension or at bumps caused by wrongly designed or wrongly installed ears or fittings. Wires out of alignment are also subjected to excessive wear and tear by the side pressure of the wheel flanges. Worn trolley wheels also cause a great deal of damage to the trolley wire and no end of trouble from a maintenance standpoint.

One-Man Fare Collection on Suburban & Interurban Railways*

By H. E. Weyman
Manager Levis Tramways

It is advisable if not necessary that fares and fare collection on one-man cars and bus be simple and easy in order to lighten the duties of the operator and speed up schedules. Anything that tends to delay the speed and operation of a car is a sore spot with the traveling public, who have been trained by the automobile to expect quickness and dispatch. A minute to wait on a siding where suburban cars meet and pass seems an hour to the passenger. A lady who delays others from entering the car through having to hunt a large leather contraption full of miscellaneous articles causes a distinct change in the atmosphere of the car. Fare collection must therefore be such as to eliminate any delays or obstruction to car movements if the company is to retain its share of the transportation of the public and hold its own with the present-day competition of the private automobile.

The fact that there is no conductor necessitates a departure from old practices. The rate of fare has also an important bearing on the collection. The cash fare should be a simple coin per zone with possibly ticket rates to the constant rider. The copper rate of fare is unpopular and disliked by the public and a complication for the company. The nickel or dime is therefore the logical coin and the zones should correspond to the use of these coins—5-cent, 10-cent, 15-cent zones.

The methods of collection are diversified. Railways of practically the same characteristics often use totally different methods without regard to efficiency, public requirements and operating speeds because of belief or prejudices of the managements. I am, therefore, selecting a few methods which will appeal to the open-minded management. These are: The ordinary fare box system, the hat check system, the duplex ticket system, the differential register system and the ticket issuing machine system.

I think it is only right to mention that no fare collection system has yet been devised which cannot be beaten by the dishonest passenger or employee.

The Standard Fare Box System—As long as the railway zones do not exceed more than two the standard fare box with a register, if required, can be used, making the zones pay enter and pay leave. With a cash fare only, using a single coin fare unit, this is the quickest and simplest method of collection. Owing to certain local conditions some two-zone companies are not able to use the pay-enter and pay-leave. For instance, in order to flag two steam road crossings about a mile or more apart, and also to do police work at this point, on one system the flagman is the ticket collector and policeman for the second zone, traveling on the car until it meets the incoming car, which he boards and returns, making the collection while traveling.

A popular method for more than two zones with the standard fare box is to have the passenger pay on entering, receiving a check whose color and number shows the exact zone to which it is valid. The checks are returned to the operator when the passenger leaves. These checks are quickly identified because all the exit passengers in a given zone should have exactly the same colored checks. The limitations to this plan are that such a transaction with every rider must take up quite a lot of standing time and that there is no record of the distribution and classification of passengers.

The Hat Check System, so common with the steam roads, has been extensively used by electric roads. It requires two men per car and has so many loopholes that it has been more or less discarded and it is being replaced by the duplex system on the steam roads.

The Duplex System includes some type of open pad with a punch or cutter to make the same mark on the passenger's and auditor's portions and the form where the auditor's portion as notched remains in a locked box. On some roads the passenger's receipt, serving as a hat check or kept in sight by means of a clip, is taken up by the conductor; on others this is not done. Observation of the duplex system leads to the belief that it is not well suited for heavy traffic, particularly on one-man cars. The financial leak from the use of duplexes is the possibility of the conductor reissuing a used receipt. This does not require much finesse in the way of sleight-of-hand.

The Differential Fare Register System is another long outstanding system on which the operator makes a blind record of each fare collected according to classification. The passenger has a minimum of interest in the transaction, as he just wants to be sure that he will get the ride he paid for. The protection which the register gives the company depends upon the mathematical skill and memory of the operator. A clumsy thief will soon be caught by the discrepancies between register readings and turn in, while a skillful crook can do very well indeed.

The differential fare register not only shows the classification of fare paid but also shows between what stations or points the ride was taken. As the sheet also shows the on and off times of the operator, it becomes possible to work up a valuable record of the distribution of traffic between different points and during different hours.

One user of this style (Penn-Ohio Lines) gives out individual exit-zone receipts which are returned to the operator. The manufacturer has also brought out a ticket-printing attachment which gives a duplex to the passenger.

The Ticket-Issuing Machine has been recently developed, but is not yet used to any great extent. It has, I think, great possibilities and is well worth study and consideration. Such a machine will issue a printed receipt indicating the names or zones and the fare and date, etc. The operation is pay-enter and passenger pays the operator or puts the fare into the box and gets a ticket or receipt which he must hold and give up when leaving the car.

Under this plan, as outlined, well-nigh perfect check of revenue and riding is possible. The receipts turned in by the operator should balance the returns shown by his counting-type or locked box. From time to time also an analysis can be made of receipts on a given route, hour by hour, to observe the relative distribution of traffic throughout the day. On the whole, this machine ought to answer the purpose of zone-fare lines and opens a field of possibilities.

The Honor System of the Beaver Valley—The Beaver Valley Traction Company, operating near Pittsburgh, deserves special mention for having thrown the entire fare check system overboard with no apparent results to the bad. This property is divided into

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*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

5-cent zones and is operated exclusively with one-man cars. The main line has eight zones. A traffic survey showed that 65 per cent of the passengers rode but one zone and 25 per cent for two zones. This short-haul condition was of importance in deciding to give the no-check or honor system a trial. The plan was strongly advocated by the men as a means of speeding up the service and lightening their labors. It is worth mention that these men averaged a long term of service and had the confidence of the management. The change was made on March 30, 1924. Comparison of revenue before and after indicated to the satisfaction of the management that the honor system caused no loss. Such loss as did occur was definitely identified with industrial depression, for routes which had been operating without need of fare checks (one-zone and two-zone lines) showed still heavier losses.

Regardless of the type of fare collection used, one possible improvement can be applied generally, viz., the use of rate plans which will induce regular and semi-regular users of the service to pay for their transportation in advance. On the longer systems, mileage books sold at some discount have long been popular. Shorter lines with patrons taking twelve or more rides a week might well consider the use of the weekly pass provided the ride is not too long to bear repetition for social purposes. Also there are very few roads indeed that could not simplify their fare collection by selling round-trip tickets at a discount when bought in blocks. All these prepaid transportation plans will help toward getting more of the passengers' fares and getting them faster. The one-man car means a thorough overhauling of old ideas, since the fare collection problem is more pronounced.

Economics in Power Distribution*

By A. J. Westman
Electrical Engineer Montreal Tramways.

ECONOMIC layout of substations and a distribution system for city street car lines is generally a problem requiring the exercise of sound engineering judgment, past experience and a comparison of the various practicable arrangements from all points of view.

In the case of long, single roads, such as interurban or trunk lines, the design is more susceptible to mathematical treatment because the physical layout of the road and the traffic movement are relatively simple. Such is not the case for city street railway systems, where the whole question is complicated by the intricate layout of the tracks, by stringent traffic necessities, by the limitations in the voltage drop in the feeders and trolley wire and by the importance of lowering, to a reasonable value, the potential drop in the track so as to reduce to a minimum the possibilities of corrosion and subsequent damage to underground pipes, cables and metallic structures.

No hard and fast rules can be set for solving street railway networks, but, in our opinion, the "cut and try" method, using the car spot map, described in detail in the reports of the committee on automatic substations of the A.E.R.E.A. for the years 1922-1923, is the best. This method of study is certainly laborious, but we believe it to be more accurate than analytical methods. Such a method was used by the Montreal Tramways some years ago in determining the most appropriate location of the Cote Street substation, rendered indispensable by the great increase of traffic in the congested business zone of the down-town district.

A car spot map was prepared which showed the average distribution and position of cars during the evening rush period; the average current taken by each car was indicated on this map and considered as a load in ordinary statics, so that by finding the center of gravity of all these current loads the most suitable location for the substation was ascertained. The Montreal Tramways has found the results obtained by this means so satisfactory that it is now the standard way in which any new feeder layout or substation is determined.

Pressure Drop Determines Location

As the number of cars is steadily increased on any system and cars run at closer intervals traffic stops become more frequent, thus necessitating a quicker acceleration in order to maintain the schedule speed. This means that the rate of energy consumption per car is greatly increased and, therefore, also the intensity of the electrical loading. It is obvious that the governing factor in feeder design will not be overheating, but pressure drop, and a point will be reached where it will be more economical and generally more satisfactory to increase the number of substations rather than increasing the capital investment in the layout of new feeders.

Increasing the number of substations will affect the governing economic factors as follows:

(a) The cost of buildings and real estate will increase more or less directly with number of substations.

(b) Substation equipment costs will increase, though not proportionately, with the increased number of stations; this increase will be quite appreciable in case of automatic equipment.

(c) Cost of attendance will go up with manually operated stations, and, on the contrary, will be considerably diminished when automatic equipment is used.

(d) Losses in substation machinery will increase slightly if the new stations are manually operated, but will decrease where they are automatic, due to higher load factor of the station and reduction of no-load losses.

(e) Cost of distribution copper and distribution losses will decrease as the number of stations is increased.

For comparison, these quantities must be reduced to a common basis by assuming a so-called "fixed charge" percentage and applying it to first costs. Now, if a curve be plotted representing the sum of annual fixed charges, annual cost of power losses and annual cost of maintenance, as a function of "number of substations," we will have the "total annual cost" graph. This curve will show a minimum because of some of the factors increasing, while others diminish, as the number of stations is altered; the minimum point will indicate the proper number of substations to install from an economic point of view.

This will of necessity require at least a tentative station location design, of equipment and feeder loss calculations for each group of stations considered, and the study can be made even more carefully by changing the size and number of units per station, for a given number of stations. Therefore, several plans will have to be worked out and it is evident that this will entail, particularly if the area is large, a great task both of a statistical as well as of a technical nature.

The design of the negative feeders and the exact calculation of the voltage drop in the track is considerably more complicated than that for the trolley wire and its feeders, on account of leakage current due to the rails not being insulated relatively to the ground.

The Montreal Tramways has developed an extensive and highly satisfactory system of insulated negative feeders in the heavy and medium traffic down-town districts; it is intended to extend it to all other districts, so that ultimately it will have a complete and efficient negative network within the urban area of Montreal and immediately adjacent districts. The general consensus of opinion is that increasing the number of substations is one of the best methods to reduce electrolytic corrosion of underground pipes and structures.

For the last few years the Montreal Tramways has been engaged in thoroughly redesigning its generation and distribution system. The first step taken was to determine the best location for substations. This was done by making up a spot map showing the location of cars during peak load. Arrangements were made to furnish every car conductor with a printed card on which he reported the number of his car and its exact location at 6:10 p.m. on the day selected and the direction in which car was moving; simultaneously a careful record was made of the load on individual trolley sections. With this information available, the cars were located on a map of the city, from which we determined the electrical centers of gravity of selected areas and of areas adjacent to available sources of supply; at the same time a definite policy of changes and extensions was formulated, as follows: (1) Distribute power to substations at 13,200 volts. (2) Interconnect all substations. (3) Reduce the size of trolley sections. (4) Limit total installed converter capacity in any substation to 8,000 kw. (5) Limit the maximum capacity of any converting unit in substations to 2,000 kw. (6) Reduce the number of manually operated converting stations and substitute automatic control. (7) Limit return current to any substation to 10,000 amp., except in emergency. (8) Redesign positive and negative feeder layout. (9) Systematically check rail bonding conditions. (10) Ring-bus all intersection work in track. (11) Install a telephone system between stations and supervise operation by means of a load dispatcher.

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*Abstract of a paper before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

Obviously to carry out this policy some considerable time and expense were involved and the tramways has not yet completed all the work entailed, particularly in regard to reducing the number of manually operated substations, but much of it has been carried out.

A high-tension conduit system was constructed between the Hochelaga power house and the main substations. This conduit was liberally designed to permit of future developments, 4-in. round bore clay tile ducts being used. The copper cables installed in these ducts are all three-conductor, sector shape, No. 0000 A.W.G., paper insulated for a working pressure of 17,000 volts, the insulation thickness being ½ in. between conductors and ½ in. between conductors and lead sheath, the sheath being 9/64 in.

While this conduit work has been completed, further extensions of the system are in contemplation, the intent being to have ultimately a high-tension ring bus so as to make the delivery of power to converting stations as reliable as is reasonably and economically feasible.

Arrangements have been completed with the local power company for the delivery at two points of bulk power, in the form of three-phase, 60-cycle current at a pressure of 12,600 volts. In the east end of the city, at Hochelaga, which is one of these delivery points, the company has a thoroughly modern steam plant consisting of two 15,630-kva., 13,200-volt, three-phase, 60-cycle steam turbines and 4,000 kw. of engine-driven d.c. units, which are all available as a steam reserve in the event of any failure in the supply of purchased power.

IMPROVING THE RETURN CIRCUIT

Since 1918 all rail joints in paved streets have been electrically welded, while on suburban lines rail joints have been bonded by means of head or concealed copper bonds, either braised or welded to track. In Montreal all track intersection work has been completely ring-bussed with copper cable, the size of this cable being equivalent to rail capacity at important locations. The copper bus cables surrounding any special work are laid in small wooden troughs filled with pitch and carefully tied in with the intersection by means of auxiliary cables of 500,000 circ.mil with No. 0000 tail bonds. These ring buses are laid well clear of the intersections and bonded to tracks about 5 or 6 ft. from special work, in order to eliminate joint vibration and also to permit of special work being raised without interference to cables.

The Montreal Tramways has abandoned its former practice of laying an auxiliary copper cable between its tracks as a continuous bond, and the current flow in rails is now equalized by means of 500,000-circ.mil copper cross bonds, with No. 0000 tail bonds at each end, installed at intervals of about 500 ft.

The tramways distribution system in Montreal is divided into 22 trolley sections, with an average maximum of 39 cars in each section. Our present policy is to increase the number of trolley sections in order to decrease the number of cars per section. It is our practice to connect each trolley section to at least two stations.

As the number of our substations increases, and as we complete the duplication of high-tension power supply, the tendency will be to serve each trolley section from one station only, seeing that it is obviously more economical to duplicate power supply at high voltage between stations than to duplicate, or even triplicate, the supply from several stations to any particular trolley section at 600 volts.

The size of trolley wire used is No. 00 in city distribution and No. 0000 in suburban work, while the standard type of rail used is 115-lb. girder in city streets and 85-lb. "T" in open suburban work. In the underground or central district all positive and negative feeders are 1,500,000 circ.mil, the negative feeders having a potential wire in the same sheath, which is used for checking distribution of return current.

Rail taps from underground service to track are made with 1,000,000-circ.mil cable and feed in taps to trolley with 500,000-circ.mil cable, both rail and trolley service taps being furnished with suitably inclosed disconnecting switches in manholes. In aerial distribution work the standard sized feeder is 500,000 circ.mil with 250,000-circ.mil feed in taps to trolley.

Lightning arresters are used in all trolley feed in taps from underground service, as well as at points where aerial feeders connect. No arresters are used in general city service other than as above, but all suburban lines are fully protected.

The results we have obtained with synchronous converters have been most satisfactory as regards general operation, maintenance and efficiency, the efficiency of the 2,000-kw. units being over 94 per cent on full load.

A still more recent development, and one which has received our closest atattention, has been the introduction of the mercury-arc rectifier. The Montreal Tramways has recently constructed a substation at Verdun, using this type of equipment entirely. A full description of the installation is contained in ELECTRIC RAILWAY JOURNAL of April 30, 1927. The operating results obtained at Verdun to date have been highly gratifying, although the station has only been in operation about four months; however, we feel so certain that the mercury-arc rectifier has come to stay and has so many characteristics that are superior to other types of converting equipment that we now have plans in hand for the immediate erection of a second substation which will be equipped in a manner similar to the one at Verdun.

The automatic station has now been developed to a point where it can be considered as thoroughly reliable and in many respects superior to the manually operated station. It has, of course, some limitations which may be overcome to a large extent by partial or full "supervisory" control, but a careful perusal of the technical press will show that the use of automatic substations is growing in favor.

Development of Miscellaneous Revenue*

BY W. H. BOYCE
Commercial Manager Pittsburgh Railways, Pittsburgh, Pa.

DURING the receivership of the Pittsburgh Railway, from 1918 to 1924, rates of fare were gradually increased from 5 cents until a ruling of three rides for 25 cents was reached, and under this rate it became apparent that the system could be operated to carry the financial burden necessary under company control and management. At the termination of the receivership, Col. Thomas Fitzgerald was made general manager and later vice-president of the company. At this same time the president announced, among other things, the creation of a commercial department. The creation of this department embodied the management's belief that the sale of rides should be clearly separated from the manufacture of car-miles. So far as is known, it is the only commercial department on American electric railways organized with such broad powers. Its work, under the direction of a commercial manager, falls under the four main subdivisions of traffic, public relations, publicity and safety.

Traffic promotion is under a director, to whom the supervisor of investigations and his three investigators and the supervisor of checking and his ten checkers report.

The character and amount of publicity are specified by the commercial manager.

The director of public relations is a liaison officer in relation with the police and fire departments, county detectives and other municipal representatives. He is also the clearing-house for all complaints, commendations and suggestions from the patrons of the company. Whether these come in person, by mail or by telephone, no complaint is left unsettled. In the case of complaints by mail, personal visit at the home or office of the complainant is the regular practice. In other instances, where a laborer has been hunted up at his work, the employer himself has secured a new light on the earnestness of the management.

The chief aim of all of us, however, was to win back the popularity of the street cars and to bring back the patrons to their seats in the trolleys, and to this end we devoted our efforts.

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*Abstract of a paper before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.

While the population of Pittsburgh proper is only about 650,000, the railway serves more than a million people. In 1926, 396,000,000 passengers were carried. In the same period, more than 40,000,000 car-miles were operated, with total revenue slightly in excess of $21,000,000.

Of this, $440,000 or about 2 per cent was miscellaneous revenue. A little more than half of it was received from four principal sources, namely, freight service, express service, power sales, and rental of tracks, equipment, and real estate. These sources are more or less familiar to all of you.

The largest single source of miscellaneous revenue is that of inside and outside advertising on the trolleys, the sum of this source totaling $148,350, which is more than one-third of the whole amount of $440,000 for the past year. Station privileges have been let to individuals for the selling of lunches, books, magazines, tobacco, etc., and to companies which have installed scales, automatic candy and chewing gum machines.

Of all the objects set before an electric railway management, that of securing more revenue from more, instead of less, riders should rank first and that of miscellaneous revenue should follow. It goes without saying that adequate revenue is necessary to the very life of a railway, but every means should be tried to secure such adequate revenue without impairing the railway's usefulness to the community. A change in fare which produces more revenue from more riders must enhance the good will of all who benefit from a growth in voluntary travel. This good will is often of such tangible value in leading to tax relief, new franchises and other advantages that one can really consider fare changes not from the standpoint of more gross but from the standpoint of more net. There are times when it is wise to drop a possible $10,000 in gross receipts when the reward is relief from an assured $30,000 paving or other assessment.

Fare Changes Which Have Popularized Service

From the first, the Metropolitan Pittsburgh District was far too large to be a one-fare area. When the property was relinquished by the receivers, the fare structure, exclusive of the interurbans, and Washington City, was as follows: 10 cents cash or 8⅓ cents tokens (three for 25 cents) good for one zone from Pittsburgh center, a distance varying from 5 to 7 miles; 10 cents for fare including a crosstown transfer good for 1½ to 2½ miles each side of Pittsburgh center; 10 cents flat on owl cars; 10 cents cash or 8⅓ cents token for additional zones with some routes having four zones.

Analyses of traffic obtained during the course of different increases in fare revealed a loss in usefulness. This was especially apparent from the fact that, despite restrictions in their use, free transfers rose in number at the very time that cash fares dropped. It was obvious that the public was doing all it could to avoid extra fares—whether by changing jobs or residences or taking longer walks.

In trying to correct these conditions, the new management necessarily had to feel its way. The first changes were of comparatively trivial effect on revenue and riding, but they were a welcome indication to the patrons of the management's desire to do something at once. It will be seen that as time went on, the changes grew in importance until with the installation of the Pittsburgh weekly pass on June 1, 1925, the company offered to all regular riders within one zone of downtown Pittsburgh center a fare rate equal to or less than that of 5 cent days.

In the following chronology of changes in fares and fare collections, the transfer liberalizations covering more than 125 orders for more than 1,000 concessions have been omitted to avoid laborious detail. Some of these cut off a full fare, while others gave patrons the opportunity to reach their destinations via a greater choice of routes.

Fare changes which have resulted in an increase in gross include extensions of zone limits; establishment of reduced-rate short-haul fares, reduced-rate through or round-trip tickets; liberalization of transfer privileges; combination transportation-amusement tickets; extension of a car line at the same fare; increase in the age limit for children's free rides.

If a passenger inadvertently drops excess fare into the farebox, the conductor (or operator) is authorized to make a refund up to 50 cents on his own responsibility, and if a patron wishes to pay three standard fares at a time, 25 cents may be dropped into the box directly without the purchase of tokens.

Sunday and holiday passes, sold for 25 cents within one zone and 40 cents for the entire Pittsburgh district, were inaugurated. The success with these was so great that weekly passes were established in Washington and McKeesport. These also were successful. June 1, 1925, saw the start of the first unlimited-ride weekly pass used on any American surface railway serving more than 150,000 inhabitants. The cost of the pass is $1.50 or eighteen token fares, and it is good for unlimited riding by the bearer within the one-fare area from the center of Pittsburgh. Experience with the Sunday-Holiday pass in Pittsburgh and with the weekly pass in smaller cities indicates that the passholder averages a fare of 5 cents or less.

In some instances special shoppers' cars have been run by merchants, with a half fare to patrons. The railway has been given a guarantee in each case by the merchants, keeping all collections if over the guarantee. Chartered cars also are operated to a considerable extent.

Another enterprise affiliated with the Pittsburgh Railways is the Equitable Sales Company, which has several gas and electric shops in the Pittsburgh district. Through arrangements made with the sales company, the railways organization has increased the advance sale of its weekly passes, by issuing coupons on sale of passes on Friday, Saturday and Sunday previous to the week in which the pass is good, and by permitting pass holders to present their four or five coupons used each month as redeemable for $2 or $2.50 on the purchase of certain electric or gas appliances at these stores. Each coupon represents a value of 50 cents and may be turned in on the article offered for that month.

Another source of revenue is that derived from the operation of motor coaches. The Pittsburgh Motor Coach Company, the entire stock of which is owned by the Pittsburgh Railways, was formed after an agreement had been reached as to the price to be paid to the only operator of motor coaches competing with the railways. In general the length of ride of these routes is slightly more than 5 miles with a flat fare of 25 cents and these coaches, 36 in number, are being operated at a profit.

These for the most part are the methods in use on our property for developing miscellaneous revenue, but we do not feel that this type of revenue has been developed on our lines to the extent that it might have been if greater efforts had been made. There are many other plans in effect in other cities in the United States that are perhaps just as effective as those in use in Pittsburgh. These include the sale of space on the backs of transfers, installation of vending machines in the cars, rental of entire cars during the off-peak periods for advertising, sale of tickets with coupons redeemable for merchandise, sale of rides to merchants by newspaper coupons for free transportation of customers, and rental of the entire street car system to department stores or other merchant groups.

American Association News

Membership to American Electric Railway Association Increased

THE American executive committee at its June 3 meeting approved for membership the following operating, associate and manufacturer member companies, together with new individual members. These applications were made for membership since the executive committee meeting held April 1, 1927, and reported in ELECTRIC RAILWAY JOURNAL for April 9:

Company Membership

Operating Companies

Compania Chilena de Electricidad, Limitada, Santiago, Chile.
The Mississippi Power & Light Company, Jackson, Miss.

Manufacturer Companies

Walter Bates Steel Corporation, Gary, Ind.
Cinch Manufacturing Corporation, Chicago, Ill.
D. B. Flower, Philadelphia, Pa.
General Carbonic Company, New York, N. Y.
Guide Motor Lamp Manufacturing Company, Cleveland, Ohio.
Hunter Illuminated Car Sign Company, Flushing, N. Y.
India Tire & Rubber Company, Akron, Ohio.
Protext Glass Company, New York, N. Y.
Toledo Pressed Steel Company, Toledo, Ohio.
Edwin L. Wiegand Company, Pittsburgh, Pa.

NEW INDIVIDUAL MEMBERSHIPS

Affiliated with Member Company

Operating

Engineering

Herbert R. Bristow, general foreman Toronto Transportation Commission, Toronto, Ont., Canada.

Thomas F. Burke, engineer of car equipment Interborough Rapid Transit Company, New York, N. Y.

F. W. Drowley, roadmaster Toronto Transportation Commission, Toronto, Ont., Canada.

C. R. Kinnear, assistant engineer Toronto Transportation Commission, Toronto, Ont., Canada.

W. M. Raiguel, engineer of way Philadelphia Rapid Transit Company, Philadelphia, Pa.

Lewis E. Summers, assistant operating manager subway-elevated lines, Philadelphia Rapid Transit Company, Philadelphia, Pa.

Harry G. Werner, assistant electrical engineer Philadelphia Rapid Transit Company, Philadelphia, Pa.

Transportation and Traffic

Frank B. Adair, assistant general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Paul E. Coffey, clerk to superintendent of garage Montreal Tramways Company, Montreal, Que., Canada.

C. D. Hardin, traffic manager Interstate Public Service Company, Indianapolis, Ind.

Manufacturer

American

Walter T. Sheldon, railway representative Pratt & Lambert, Inc., Buffalo, N. Y.

Engineering

Walter A. Giger, electrical engineer traction division, American Brown Boveri Electric Corp., Camden, N. J.

J. F. Tritle, engineer Control Division, railway engineering equipment department, General Electric Company, Erie, Pa.

Not Affiliated with Member Company

Operating

Engineering

Harry F. Ferguson, general foreman Department of Street Railways, Detroit, Mich.

William Machleit, general inspector Department of Street Railways, Detroit, Mich.

T. Sakamoto, Japanese Government Railways, New York, N. Y.

Kagoro Ochiai, electrical engineer Electric Bureau, Japanese Government Railways, Tokio, Japan.

Maurice Toby, assistant supervisor of way and structures, Eighth & Ninth Avenue Railway, New York, N. Y.

Manufacturer

American

Mrs. A. Fenton Walker, United States and British representative *Canadian Railway and Marine World*, New York, N. Y.

American Executive Committee Meets

SUBJECTS of major importance occupied the attention of the American Electric Railway Association executive committee at a busy meeting held at association headquarters in New York on June 3, 1927. Those present included the following: W. H. Sawyer, president; R. P. Stevens, J. H. Hanna, L. S. Storrs, F. R. Coates, C. B. Proctor, Daniel Durie, J. V. Sullivan, Harry Reid, C. E. Morgan, E. P. Waller, B. A. Hegeman, Jr., T. A. Kenny, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, L. C. Bradley, H. L. Brown, T. W. Casey, E. B. Meissner, Robert I. Todd, C. D. Emmons, A. W. Brady, Gen. G. H. Harries, Edward Dana, H. B. Flowers, H. L. Mitchell, T. R. Langan, J. W. Welsh and Mr. McKay representing G. H. Ernsberger of the Oklahoma Utilities Association.

A report for the publicity committee made by Barron Collier, vice-chairman, was read by Secretary Welsh. The committee reported the preparation of three new posters since the last meeting. The subjects are traffic congestion, shop or carhouse safety and interurban merchandising. Interurban poster service is being broadened by the committee. At least one out of each three posters prepared is now being directed to interurban work. Plans are being made to issue some large one-sheet posters directed to merchandising interurban freight.

The booklet on electric railways for use in schools has been thoroughly revised and is being offered to individual companies. It has been distributed to the extent of 20,000 to the New England district by the New England Committee on Public Utility Information and to the extent of 5,000 in Indiana by the Indiana committee. In other states it has gone forward to the individual member companies.

Under the supervision of the Board of Education in Cincinnati a booklet on the Cincinnati Street Railway has been prepared and distributed among Cincinnati schools. Copies of the book have been distributed to member companies with the suggestion that they might do well to follow a similar plan with the schools in their respective localities.

Reporting for the membership committee, Chairman C. R. Ellicott took occasion to stress the importance of membership to the existence and progress of the association. He characterized a continual flow of new members as constituting the very lifeblood of the association and made a plea for co-operation on the part of each member of the committee and of operating executives interested in the association's progress, even though they are not active members of the committee. Two new operating company members, ten manufacturers, and 21 individual members were reported since the last meeting of the executive committee.

Chairman C. E. Morgan for the finance committee reported that there had been a reduction made in operating expenses for a period of six months amounting to $17,477. This, he said, had been brought about through the full co-operation of the association's operating staff.

Harry Reid, chairman of the committee on national relations, said that there are no problems which require the attention of his committee at the moment. He took occasion to compliment Managing Director Storrs and the members of the sub-committee on depreciation, who succeeded in winning a postponement of the depreciation hearing before the Interstate Commerce Commission in order to give the industry time adequately to prepare its case.

A report of the committee on co-operation with manufacturers was read by Secretary Welsh. Booklets reproducing an address by City Manager Sherrill of Cincinnati have been distributed by the committee through the manufacturers. Two posters for use on bulletin boards and stickers for use on freight and express packages have been offered to manufacturers. The committee has decided to issue two booklets, one dealing with the sale of car rides and the other directed to electric railway salesmen to point out how they may help in stimulating the adoption of better methods of getting business.

The committee is going to make a special effort to induce manufacturers to visit the electric car exhibit at the convention this year. A letter also has been written to the editors of the various trade journals asking them to run editorials just before the convention urging all exhibitors to visit the electric car exhibit and take some customers with them. A letter also will be sent by the chairman of the committee to manufacturer members shortly before the convention urging them to fall in line with this work.

A suggestion by Chairman F. R. Coates was made in behalf of the committee on co-operation with state and sectional associations, for the coming Cleveland meeting. He felt that it would help to foster a spirit of co-operation if there could be a meeting arranged to include his committee, the executive committee and representatives of the various sectional associations. This matter was referred to the committee on meetings and subjects.

Work of the committee on revision of the constitution under the chairmanship of C. D. Emmons was taken up in detail. The revised constitution was adopted by the executive committee for presentation at the convention. At the suggestion of the executive committee a statement will be prepared by Mr. Emmons' committee explaining, for the information of the industry, the principal changes made in the constitution and the reason for this action.

A report was submitted by the special committee authorized at the last executive committee meeting to devise if possible a plan to carry out the recommendations made by the policy committee in regard to changes in the association's publishing policy. The report indicated that the policy committee's recommendations in favor of reducing the publishing cost of *Aera* and bringing about greater co-ordination between the association and the technical press to minimize duplication can be carried out in the interests of the industry. This report was received by the executive committee on motion of R. P. Stevens. The publications committee was instructed to carry out the plan outlined by the special committee and to make this effective at as early a date as is practicable.

The sentiment of the manufacturers regarding various features of the exhibit was expressed in the report of a special committee under the chairmanship of T. W. Casey. Its recommendation favored keeping the exhibit closed to the public. In addition it recommended that the showing of baseball scores as prominently as was done last year be eliminated. Stimulation of attendance at the exhibits when they are opened on Saturday noon was strongly urged. A suggestion was made that week-end trips for employees in the vicinity of Cleveland be arranged.

The date and place of the next meeting was left to the president.

The News of the Industry

New York State Men Reject Renewal Proposal

For the second time within a month employees of the Rochester, Utica and Syracuse lines of the New York State Railways voting simultaneously rejected the proposal for renewal of the 1926 wage agreement. The vote was 883 to 652. The proposal had been rejected previously by 133. It is believed that arbitration will be resorted to, although further bargaining is being carried on in the hope of framing a satisfactory contract.

Rehearing Sought in Des Moines One-Man Car Issue

The Des Moines City Railway, Des Moines, Iowa, has filed application for a rehearing before the Iowa Supreme Court, which on April 7 handed down a decision upholding the validity of an agreement between the company and the street car men's union requiring the presence of a motorman and a conductor on every Des Moines street car. In the application the company sets forth that the twenty-year agreement between the car men and the company, which has been in effect since 1915, is in violation of the public interest; that lack of a decision by the court on the validity of the check-off places the company and the public in continual jeopardy of a strike; that the section of the agreement which prohibits one-man cars is void, and that the entire contract is void because it unionizes an entire industry in the community. The petitioner takes issue with the former decision of the court with regard to the right of the company to question the agreement or contract with the car men. It is claimed by the company that under the provisions of a service-at-cost franchise it has an "indisputable status as a representative of the public interest."

In part, the petition declares:

> The 1921 franchise provides for street car service at cost and for a variable rate of fare which fluctuates with the cost of production of service to be given by the company under the franchise. It is thereby demonstrated that the public in general and the car-riding public in particular is vitally interested in the cost of production of street car service in Des Moines. The higher the cost, the higher the rate of fare, and the cost of a ride is correspondingly greater to each individual rider.
>
> The public now has a very direct financial interest in the street car business and is quite directly interested in the inauguration of improvements that will lower the cost of operations, and hence tend to lower the cost of fare to be charged. And the public is vitally interested in the elimination of anything which tends to impair the ability of the company to perform its duties and obligations under the present franchise.

Meanwhile the company continues to show increasing monthly operating deficits under two-man operation. The report of the auditor for April showed that the deficit for the month was $10,875 and that the total accumulated deficit to the stabilizing fund was $47,417 as of April 30. The company is still operating under a 10-cent cash fare and a weekly pass which sells at $1.25. The pass is transferable and good for any number of rides during the seven-day period. The total weekly sale runs from 10,000 to 12,000.

Public Hearings on Chicago Enabling Bills

Mayor Thompson Gives Full Approval to Bills as Amended by Aldermanic Body—Senate Passes Two of Five New Railway Measures

Responding to pressure brought to bear by a number of questioning Senators and by various civic organizations in Chicago which have insisted that the bills are being rushed through to a vote without an adequate opportunity for study and discussion, the joint committee on public utilities of the Illinois State Legislature called a final public hearing on June 7 for the five enabling bills introduced last month by the Chicago transportation companies. The bills had been reported out and recommended for passage by this committee on May 31, after two days of public discussion, and are already on the second reading in the Senate. It was for the purpose of giving every one an opportunity to suggest any amendments which in his opinion might improve the bills and of correcting what it was feared might arouse unfavorable public and newspaper opinion that the hearings were reopened. Another reason for delaying action on the bills was said to be the hesitancy on the part of several senators to pass on the bills without first obtaining the views of Mayor Thompson.

Amendments to Bills Dropped

The Senate passed and sent to the House on June 9 two of five Chicago traction bills. Others were scheduled to pass on June 10 unless sentiment changes radically. The subway bill won by 30 votes to 20. The second bill rescinding the twenty-year franchise limitation was approved by 34 to 8. The majority of the amendments proposed to both of these bills were dropped.

Objections to certain features of the bills were loudest from the quarter of the local transportation committee of the City Council, where bill No. 5, which would amend the state utilities act and provide for control of the consolidated system by a mixed commission of city, county and state appointees with jurisdiction over lines in every part of Cook County, was closely scrutinized for possible omissions and clauses liable to be misinterpreted. Notwithstanding Mayor Thompson's approval of the basic principles involved and his conviction that this bill gives the largest possible measure of home rule consistent with the laws of the state and the early solution of the problem as a whole, the Aldermen found much to be desired in the bill in its present form. They are opposed to the clause which makes the proposed county transit commission subject to supervision by the Governor and financially supported by the state, declaring that such terms remove the last vestige of local control of the city's transit system from the City Council. The local transportation committee has been a consistent advocate of the previously reported Durso bill, which proposes to take control of the Chicago local transportation agencies entirely out of the hands of the State Commerce Commission and vest it in a purely local body.

The committee also voiced objections against bill No. 2, which amends the cities and villages act of 1872 by dropping the twenty-year limit on future railway franchises and provides for the issuance of terminable permits. As a result of the hostility shown by several members, Corporation Counsel Samuel Ettelson was instructed by the committee to draft a substitute bill which will leave it discretionary with the City Council to grant term franchises or indeterminate permits.

In an address before the West Towns Chamber of Commerce, John M. Harlan, attorney for F. J. Lisman & Company, whose proposal to take over the surface lines under a twenty-year franchise is still pending before the local transportation committee, maintained that the bills are "full of dangerous jokers and are designed to put the city's transportation lines more firmly in the grip of Samuel Insull." He declared that passage of the bills would mean a perpetual franchise and would prohibit the city from granting a twenty-year franchise. A joker in Section 6 of the subway bill, he said, will mean the expenditure of many millions of dollars by the city in relocating public utility properties which interfere with subway construction. Failure of the drafters of the bills to say anything about a referendum was another point he attacked.

In answer to the statements made by critics of the measure, Mr. Insull said:

> Elimination of the present twenty-year restriction on street railroad grants is certainly not a "joker" as the term is commonly understood. Provision for this elimination is stated as plainly as possible in the

bills themselves and has been emphasized in all statements from proponents of the bills.

The only restrictions upon future action by the City Council in dealing with local transportation are that future street railroad grants shall be indeterminate during "good behavior" so to speak, and that terms and conditions be not inconsistent with existing law. It is expressly provided that street railroad construction or operation shall not be possible without the consent of local city authorities.

If the City Council does not want unification and development of local transportation and rapid transit, if it prefers to let the city stumble along under present conditions, it may do so.

The elevated loop is not involved in the proposed legislation. What may be done with the loop is a detail to be disposed of when the City Council undertakes to frame an ordinance for unification and development.

There is no reason why a referendum should be referred to by name or otherwise in the proposed legislation. The city authorities have full power to prescribe a referendum on any ordinance for unification and development that may be framed. If the City Council and the city administration can be trusted to deal with all the complexities of a grant for unification and development, surely they can be trusted to prevent any "fast and innocent stuff being pulled" by way of an indeterminate permit as an extension of the present temporary permit to the Surface Lines.

Whether these and kindred misrepresentations are made willfully or misunderstandingly, the effect of them is that of the traditional red herring drawn across the path of the proposed legislation. They only clutter up and confuse and impede full and frank discussion of the traction situation.

The principal defender of the measures was Patrick J. Lucey, attorney for the Insull interests. In explaining the provisions of the home rule and indeterminate bills, at which the heaviest opposition was directed, Mr. Lucey asserted that the home rule idea is the "most comprehensive and complete home rule plan that has ever been developed." On the question of terminable permits, he said: "Twenty years is too short a time to finance a big property. It cannot be done. An indeterminate franchise is necessary. This is the sanest and cleanest-cut plan that has ever been presented for a solution of the problem."

"Nellie Kelly" Goes Over Big in Buffalo

Employees of the Philadelphia Rapid Transit Company, Philadelphia, Pa., who presented George M. Cohan's musical comedy "Little Nellie Kelly" in the Academy of Music in Philadelphia earlier in the season, went to Buffalo and staged the show for three nights in the Teck Theater for the benefit of the Helping Hand Fund of the International Railway Co-operative Association of Buffalo. The theater was sold out for each of the three nights of the show. Almost 100 were in the cast, staged under direction of W. A. Costello.

Confer on Wages.—Negotiations are now in progress between the officials of the Connecticut Company, New Haven, Conn., and the executive committee of the trolley men's union, but no decision has been reached. It is said that the men are demanding a wage of 75 cents an hour for the operators of two-men cars and 15 cents an hour additional as the rate to be paid for one-man car operators. Eight hours instead of nine for a day's work is also asked.

Extension of San Francisco Municipal Railway Opposed

The question of municipal ownership as applied to water and transportation will be passed on by voters of San Francisco on June 14, when the fate of proposed bond issues totaling more than $50,000,000 will be decided. A two-thirds vote will be required to pass each of the five issues up for approval. The Chamber of Commerce has voiced its disapproval of the $4,700,000 bond issue for municipal railway extensions, and the passage of this portion of the bond program is very much in doubt.

The San Francisco Real Estate Board is another strong organization that has refused to sanction the idea of municipal railway extension bonds, declaring in a lengthy statement that at least two sections of the city in which it is desired to extend the car lines are already adequately served by the Market Street Railway.

At the present time the total municipal railway trackage in San Francisco is 69.4 miles. The new bonds provide for 29 miles of additional track.

The bonds, if voted, will give the municipal line the use of the new Duboce tunnel into the rapidly growing Sunset district. This tunnel was built by special assessment of the property owners at a cost of $1,250,000.

Another tunnel use of which is desired for the municipal line is the proposed Bernal cut, for which bonds amounting to $1,400,000 are asked of the voters in Tuesday's election. This is a surface tunnel in the Mission district, linking that district with the new Excelsior district now served by the Market Street Railway.

Other extensions for which bonds are asked are: Marina Loop, to cost $94,000; Balboa Street line to the beach; Taraval Street line, along the beach to the Fleishhacker Pool, a favorite playground in the city, and the Eureka Valley extension, which Mayor James Rolph personally sponsored.

Even friends of the bond issue admit that the Eureka Valley extension is unnecessary at the present time and will probably cause a deficit, as the district is now adequately served by the Castro line of the Market Street Railway. It is pointed out, however, that the franchise of the Castro line has not long to run.

It seems likely that the voters will approve $40,000,000 bonds to purchase the distributing system of the Spring Valley Water Company, as only slight opposition has apparently developed to this plan.

Ten Cents Sought in Atlanta

A petition of the Georgia Power Company to charge 10 cents for a cash fare and 25 cents for three tickets in Atlanta, Ga., was filed on June 3 with the Georgia Public Service Commission.

In its petition the company states that at the present time the railway in Atlanta is failing to yield an income of 8 per cent by approximately $1,000,000 a year.

The request is in line with a sliding scale of rates proposed more than a year ago, when a survey was made of the entire railway situation and it was agreed that if the present rates did not provide the necessary funds a reasonable increase in rates would be granted.

Rates at the present time are 7 cents for a cash fare and 20 cents for three car tickets, with fifteen tickets sold for $1. These rates went into effect in 1920, at which time the fare was increased from 6 to 7 cents.

Six Months' Respite to Be Asked in St. Louis Fare Case

City Counselor Muench of St. Louis, Mo., plans to ask the Missouri Public Service Commission for six months' time in which to prepare the city's defense to the application of Receiver Rolla Wells of the United Railways for an 8-cent fare and a valuation in excess of $75,000,000. If the commission grants the city this concession it is probable it will sanction temporary relief for the railway in the form of some increase in fares, possibly two tokens for 15 cents. The present fare is 7 cents.

COMPARISON OF THE EARNINGS OF UNITED RAILWAYS, ST. LOUIS, MO., FOR YEAR ENDED DEC. 31

	1926	1925
Gross operating revenue....	$18,873,431	$18,894,575
Expenses, depreciation and taxes..................	16,445,146	16,494,778
Operating income..........	$2,428,295	$2,399,797
Other income.............	202,874	285,450
Gross income.............	$2,631,168	$2,685,247
Interest and miscellaneous charges..................	2,677,569	2,892,515
Loss from operations.......	$46,400	$207,268
Rental from bus equipment.	2,836	1,094
Net loss for year..........	$43,564	$216,174

The company at the recent hearing on the petition claimed that its reproduction cost new, less depreciation, is $98,573,264 for operating property. Its actual investment cost for the operating property was $59,958,352. Somewhere between this range of $40,000,000 it hopes to have its rate-making valuation set and to be permitted to earn 8 per cent on such valuation.

In the negotiation between the city and the company relative to a 30-year service-at-cost franchise the St. Louis Public Service Company, which will succeed the United Railways under foreclosure, has sought to obtain a 7 per cent return on a valuation of $58,700,000, which the commission set some time ago. A 7 per cent return on $58,700,000 would be $4,109,000, while 8 per cent on $75,000,000 would be $6,000,000. To net the latter amount the company would need a 9-cent fare. At present the company earns only 4.2 per cent.

The net loss of the company for the year 1926 was $43,564, compared with a loss of $206,174 in the preceding year. A summary of the statement of earnings contained in the pamphlet report of Receiver Rolla Wells as filed with the United States District Court is contained in the accompanying table.

Wage Issue in Chicago Becomes Acute

Demands of some 15,000 platform men and other classes of employees of the Chicago Surface Lines, Chicago, Ill., for a wage increase of 15 cents an hour were denied recently by the companies' executives. The latter have countered with a proposal to reduce the men's wages 5 cents an hour below the present scale of 75 cents an hour.

As a result of the management's action members of the local street and electric railway employees' union voted on June 6 to hold a strike referendum. If voted, the strike will not be immediate, but will be called at the instance of President William Quinlan of the union, should he be unable to reach a satisfactory wage agreement with the Surface Lines. The street car employees have been working without a wage contract since negotiations for a 5-cent increase failed a year ago this month.

Following the refusal of the Chicago Rapid Transit Company to consider a demand for a 15-cent increase over the present 72-77-cent hourly wage rate, 5,000 elevated trainmen are also expected to hold a strike referendum.

Negotiations of this company for a new scale to replace the agreement which expires May 31 were opened several weeks ago. At that time Vice-President Bernard J. Fallon informed the union representatives that conditions did not warrant the paying of increased wages and asked the men to accept a cut of 15 cents an hour. A wage increase of only 5 per cent, he contended, would wipe out the company's operative profit.

Medal for Safety in Atlanta

A gold medal, to be known as the Cody Safety Medal, has been offered by Chief William B. Cody of the Atlanta fire department to the Atlanta (Ga.) trainman who completes the year 1927 with the best safety record. It is probable that the medal will be offered each year in the interest of promoting greater safety in the city.

Dedication of Business School of Harvard University

In the presence of a great throng of distinguished visitors, the new buildings of the Harvard Graduate School of Business Administration were dedicated at Boston on June 4 with addresses by Owen D. Young, former Dean Edwin F. Gay, Dean Wallace B. Donham and others.

George F. Baker of New York, donor of the magnificent group of new buildings designed to house the activities of this notable school of economics, finance and commerce, presented the keys to President Lowell of Harvard University and added another $1,000,000 to the $5,000,000 already given by him to the institution.

In his address Mr. Young outlined the evolution of trade from primeval days, discussed the increasing trend toward high ethical practices in modern business, emphasized the rise of the trade association as a factor in creating sentiment, and dwelt upon the growing importance of investment sharing by labor in the enterprises in whose responsibilities it is increasingly concerned. The part such an institution as the Harvard school may play in economic problem research and in training men for business as a profession was comprehensively outlined. Mr. Young said that he regarded the question of unemployment as one of the most important to which consideration should be given.

East St. Louis Cuts Fare in Lean Hours

To encourage travel during the hours of the day and evening when patronage has been lacking of late, the East St. Louis & Suburban Railway, the East St. Louis Railway and the Alton, Granite & St. Louis Traction Company, all operating in and out of East St. Louis, Ill., will offer bargain rates during certain periods of the day in June, July and August. Non-rush-hour tickets will be sold at the rate of seven for 50 cents, compared with the regular rate of 10 cents or five tokens for 40 cents. The bargain tickets are good all day Sunday and on weekdays from 9 a. m. to 3:30 p. m. and 7 p. m. until 11:59 p. m. On the suburban lines the tickets will be accepted in part payment of fares and with the addition of 5 cents in cash will be good for passage across the Eads Bridge to St. Louis during non-rush hours.

The innovation resulted after several weeks of careful study of railway conditions in St. Louis, East St. Louis and other large cities. It was found that from 6 a. m. to 8 a. m. and from 5 p. m. to 7 p. m. the railway facilities are often overtaxed, while travel is light at other times.

Attention! National Safety Council Members

THERE was a wave of new members during the month of May. Going along from day to day, we are apt to forget how great the power behind the safety movement has grown to be. Yet when the need arises the membership behind the National Council grows beyond all expectations.

We are growing—eight out of the last ten months have shown an increase in members over the same months of the year before. Nothing can stop us from continuing our growth; eventually the safety movement will reach every person in the United States. Real loyalty, one of the finest things about the National Council, will take care of that.

All of us know that we are dependent on the members we now have to get new members. Will you use your influence to add to our size and to the strength of the safety movement? Will you take the application with you and go out and see a prospect?

WALTER G. KING,
President.

Wage Agreement in Winnipeg

A three-year wage agreement effective May 1 has been reached between the Winnipeg Electric Company, Winnipeg, Man., and its trainmen. It provides a general increase to motormen, conductors and bus men of 1 cent an hour, with an annual increase thereafter of 1 cent an hour, until the former maximum rate of 60 cents an hour to two-man operators is re-established on May 1, 1929. A. W. McLimont, president, made the proposal to the men. He said that he had in mind the necessity for stabilizing relations between the company and its employees and thus obviating the necessity of annually discussing wages or appearing before boards of arbitration or conciliation, with resultant loss of time and effort to both parties. He said he now looked forward "to three consecutive years of wholehearted co-operation between men and management."

Line from Grand Rapids to Jenison to Open Up

Officials of the United Suburban Railway, Grand Rapids, Mich., successor to the defunct Grand Rapids, Holland & Chicago Railway, announce that the Michigan Public Utilities Commission has approved the new company's organization and that operation of cars between Grand Rapids and Jenison, the two terminals of the new road, will be started by June 15. The opening of the new road, which will partly replace the old Holland division of the Michigan Railways, will be the signal for a public celebration that is being arranged by the Grandville Business Men's Association. The officials announce that Gov. Fred W. Green will be invited to officiate as motorman on the first car to be run over the new line, and invitations will be extended to merchants and citizens at all points along the route. Grand Rapids business men and state officials are expected to be guests.

At a meeting of the directors on June 3 the trolley wires were ordered to be replaced and everything put in readiness for immediate operation. This action was taken to anticipate the arrival of five used cars recently purchased in New York that have been remodeled and are expected from the East at once. The operating company is composed of 700 residents in the different communities served. It has 7 miles of double track and will operate through Galewood, Burlingame and other places en route to Jenison.

Omaha Franchise Debated

All efforts to compromise the matter having failed, the City Council of Omaha, Neb., has appropriated $5,000 to finance the defense of the city in the suit brought in federal court by the Guaranty Trust Company, New York, representing the bondholders of the Omaha & Council Bluffs Street Railway, to test the question of whether the company has a perpetual franchise. The city maintains that the franchise is a terminable one and will shortly expire. The money appropriated is to enable the city attorney to employ other competent legal help, since Corporation Counsel Lambert has resigned.

Recent Bus Developments

Bus Route in Jamestown to Replace Car Service

A proposal to abandon the present Lakewood street car line out Fairmount Avenue and replace it with a bus route from Jamestown, N. Y., to Lakewood was laid before the City Council on June 6, when the Jamestown Motor Bus Transportation Company and the Jamestown Street Railway made formal application for a franchise for the new bus route. A public hearing on the application will be held by the Council on June 17. Meanwhile the transportation companies will seek the consent of the Public Service Commission to abandon the trolley line and will request the village of Lakewood for a bus franchise. It is proposed to have the new bus route in operation by July 1.

In the application for the franchise Marion H. Fisher, attorney, explained that the decision of the street railway to abandon the old Fairmount Avenue line to Beechwood and Lakewood had been contemplated for some time because the line had been losing money. The necessity for repaving the company's tracks in Fairmount Avenue had brought the question to a head.

The new line, Mr. Fisher explained, will become a part of the present street car and bus transportation system and the same rate of fares, with transfer arrangements that now exist, will be applied. Three new buses will be purchased, two of them to be used on the Lakewood line and the third to augment the city transportation system.

Chicago Motor Coach Officials Favor Traction Unification Plans

In the discussion of ways and means to bring about unified operation of the various local transportation systems in Chicago in conjunction with a final settlement of the problem, inclusion of bus lines has been taken for granted. The enabling bills prepared by the railways and introduced in the Legislature permit, but do not make obligatory, operation of buses by the new company to be formed to operate the surface, elevated, and subway lines when built.

Although no formal statement of their attitude toward the unification plan has been made by the Chicago Motor Coach Company officials, it is understood that the company is generally in accord with the plan as developed by the surface and elevated lines executives. The terms on which the bus properties would be taken over by the consolidated company have not been evolved.

According to John A. Ritchie, president, the business of the Motor Coach Company has been developing favorably this year, with gross income for the first four months of $1,766,220, compared with $1,559,865 in the corresponding period of 1926, and net income totaling $133,205, or more than three times the $39,921 of net income for the first third of last year.

Mr. Ritchie and other officials are of the opinion that unification of transit facilities offers the best solution of the local transportation problem. Their own plan for substitution of buses for street cars under a twenty-year franchise, which was presented to the City Council last November, probably will not be pushed, if the present traction bills meet with legislative and popular approval. They believe that the motor coach will serve two main purposes in such a consolidation: (1) Transportation on boulevards, in parks and other sections of the city not reached by electric cars, and (2) operation as a feeder to elevated, surface and subway lines.

Definite Action Awaited in Columbia

The transportation problem in the city of Columbia, S. C., has reached a stage where definite action by the City Council is imperative. The matter has grown more complex since March 11, when the cars of the Columbia Railway, Gas & Electric Company ceased to function.

The service had been discontinued without notice to the Railroad Commission. Complaint was made and the utility company was ordered to show cause before the commission why service should not be resumed. Following a hearing an order was issued requiring the railway to resume operations March 31. The company asked for a rehearing and filed a petition for permission to discontinue permanently the operation of railway service in Columbia and to surrender its franchise. The petition was granted by a majority of the commission, and now the Attorney-General has asked that further hearing be had in order that additional testimony may be taken.

Lack of patronage was assigned as the reason for the discontinuance of trolley service. Before the cars were removed the Carolina Transit Company began operating buses, interchangeable transfers being used with the street cars. After the street cars were abandoned bus service was expanded and soon a score of machines, each of 29-passenger capacity, were operating. Meanwhile the 10-cent jitney, a considerable factor in cutting down the revenue of the street cars, was operating everywhere, running in front of and behind buses, picking up passengers and cutting deep into the prospective revenue of the bus company. The bus concern began losing money and became more and more involved as it began to limit its service and as the number of unrestricted jitneys increased.

Now the bus company has made a definite proposal to the City Council —either the jitneys must be kept off the streets on which the buses run or the buses will discontinue operations, and Columbia, which a few months ago had three systems of transportation—the street car, the bus and the jitney—will find itself with only one, the jitney.

Creditors of the bus company have agreed not to bring receivership or bankruptcy action against the bus company for a period of time, and the company from which the buses were purchased has agreed to take over the operation of the bus lines until it can work itself out of the bog. But that company will not take over the buses until the City Council passes an ordinance throwing some sort of restrictions around the operation of the 10-cent jitneys. The Council has not yet taken any action in the matter, though it has under consideration an ordinance which would give the desired protection to the bus company.

Motor Coaches to Replace Stamford Trolleys

A squadron of fourteen large city-type motor coaches left the shops at Long Island City on June 9 and, after parading the length of Fifth Avenue, Manhattan, headed toward Stamford, Conn., where they will go into service at 7 a.m. on June 12, replacing trolley cars of the New York & Stamford Railway.

The coaches will forge another link in the County Transportation Company's projected motorization of all interurban and local trolley lines serving Stamford, Sound Beach, Greenwich, Cos Cob, Mianus, Put's Hill and Chickahominy in Connecticut, and Portchester, Rye, Harrison, Mamaroneck, Larchmont, Larchmont Gardens, Larchmont Manor, Rye Beach, Oakland Beach, Milton Point and New Rochelle, all in the Long Island Sound section of Westchester in New York State.

Garage facilities for upward of 80 buses have been installed at Portchester on the site of the carhouse of the New York & Stamford Railway.

Although Portchester locally is served exclusively by the motor coaches, local officials have not yet consented to permit the County Transportation Company to operate motor coaches over the main-line trolley right-of-way, which passes through Portchester en route from Stamford to New Rochelle. The main-line trolleys will therefore continue to operate from the Connecticut border southward to New Rochelle, while the motor coaches will operate between Stamford and the state line. For the present, at least, passengers will transfer from trolley to motor coach or vice versa at the bridge which marks the state border.

The fare will be 10 cents per zone, or 20 cents from Stamford to the state line, as compared with the trolley rate of 7 cents per zone, with approximately three zones between Stamford and the state line.

The delay in Portchester's consent to the operation of interstate coach service over the main-line trolley right-of-way is apparently the only remaining barrier to the complete abandonment of the railway system and installation of motor coaches on all the routes now covered by the trolley lines.

Action on New York Franchises Again Postponed

The Board of Estimate of New York City on June 3 again postponed action on applications for bus franchises. When the bus franchise item was reached on the calendar, Borough President John A. Lynch of Richmond, believed to be one of Mayor Walker's supporters for a grant of a franchise for Manhattan, Brooklyn and Queens to the Equitable Coach Company, moved that it go over for one week. There was no objection to the postponement. After the meeting, it was said the deadlock in the board on the granting of bus franchises was apparently so pronounced that there was little hope of action before the fall.

Rights Granted Utah Company

A certificate of convenience and necessity, permitting it to operate as a common carrier by rail and by stage between Ogden, Utah, and the Utah-Idaho state line and intermediate points, has been issued to the Utah-Idaho Central Railroad by the Public Utilities Commission of Utah. The company also was granted permission to operate a bus line for the transportation of passengers over the streets of Logan, Utah. All the rights and privileges formerly enjoyed by the old Utah-Idaho Central Company were granted to the Utah-Idaho Central Railroad in the certificate.

Buses to Replace Trolleys. — The Board of Public Utility Commissioners of New Jersey authorized on May 28 abandonment of trolley service by the Public Service Railway between Main and Day Streets, Orange and Elm Streets and Bloomfield Avenue, Montclair. Buses will be substituted.

Replace Cars Temporarily. — The Carolina Transit Company, a bus company operating out of South Carolina, has established a bus line at High Point, N. C., to replace the North Carolina Public Service Company, operator of the electric railway system in that city. According to officials of the company, the replacement of bus service by railway service is only a temporary arrangement, it having been mutually agreed to give the bus concern an opportunity to furnish the transportation service. The company has six buses in High Point, five of which are operating on twenty-minute schedules and one of which is used for reserve. Four of the bus lines traverse the same territory as the railway, while one bus operates on a crosstown route.

Decision Withheld Following Hearing. — The Public Service Commission held a public hearing on June 7 on the petition of the Capitol District Transportation Company, Inc., for permission to operate a bus line between the cities of Albany and Rensselaer. This company is a subsidiary of the United Traction Company.

Two Buses Serve.—The Rockford & Interurban Railway, Rockford, Ill., has placed two buses in daily operation connecting Beloit, Janesville and Rockford. Tickets are interchangeable between the two types of vehicles.

Financial and Corporate

Commission Will Approve Purchase of Baltimore Interurban

The acquisition of a controlling interest in the Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, by the Consolidated Gas, Electric Light & Power Company, also of Baltimore, will be approved by the Maryland Public Service Commission. The announcement of the plan to approve the deal was made after the commission had held a hearing on the subject on June 3.

The petition filed by the Gas & Electric Company requested that the commission approve its purchase of 45,433 shares of capital stock of the railroad through the medium of a holding company. More than $1,000,000 is involved in the transaction.

In acquiring the road the Gas & Electric Company will take over 54 per cent of the total stock. It also, as a part of the transaction, will acquire the Annapolis & Chesapeake Bay Power Company, a subsidiary of the railroad serving the residents of a large part of the territory between Baltimore, Washington and Annapolis with electric current.

In testifying before the commission Herbert A. Wagner, president of the Gas & Electric Company, said that the company had no intention of disposing of the property. He said the service will be improved still further and that efforts will be made to increase the freight traffic.

Stock in Mitten Investment Corporation Issued Publicly

Formation of a $50,000,000 investment concern whose stock at a par value of $25 was offered to the public on June 6 was announced in Philadelphia on June 4 by Mitten Management, Inc. The new organization is to be known as the Mitten Bank Securities Corporation.

The full authorized capital is $50,000,000, but the amount of the first stock issue has not been determined. Proceeds of the paid-in capital will be used for purchasing stock of the Mitten Men and Management Bank and Trust Company, the Philadelphia Rapid Transit Company and other concerns which Mitten Management, Inc., may operate.

The entire capital will be issued as common stock with full voting powers and with no fixed dividend rate. An official statement says:

> Mitten Bank was formed for the express purpose of providing a banking service for these new capitalists, (P.R.T. employees) and to meet their desire that the same advantages might be extended to other workers, to the end of helping labor to become capital. Within the past year the stock of Mitten Bank has increased to nearly three times its original price.
>
> The money paid in on Mitten Bank Securities Corporation will be largely devoted to Mitten Bank and its facilities and kindred activities, and to investments in and producing increased economic efficiency for P.R.T. and for other promising properties. All the profits will go to the Mitten Bank Securities Corporation stockholders.
>
> Nothing would please us more than to sell one share to every man, woman and child in Philadelphia. Such a wide distribution would advance the Mitten idea, which is to promote industrial democracy by spreading more widely the profits of industry.

T. E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, made the following statement:

> Here is an opportunity for the public to own a part in the Mitten Bank and to participate in industrial, financial and public utility undertakings offering safe and profitable possibilities, assured of effective direction through the supervision of Mitten Management, whose policy of enabling the workers to participate in profits earned by increased efficiency not only insures the investment against loss by strikes and poor workmanship, but helps to establish a better order of society through labor becoming capital.

Traffic Fare and Wage Figures

Electric railway passenger traffic decreased slightly in April, 1927, compared with April, 1926. The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 216 companies is as follows:

April, 1927	835,658,373
April, 1926	837,210,029
Decrease, per cent	0.19

Average cash fare in cities of 25,000 population and over:

	Cents
May 1, 1927	7.8304
April 1, 1927	7.8194
May 1, 1926	7.6689

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913=100 Per Cent
May 1, 1927	57.09	209.50
April 1, 1927	56.97	209.06
May 1, 1926	56.72	208.15

Bonds Coming In for Terre Haute Change

At the close of business on June 1 91 per cent of the first and refunding mortgage 5 per cent bonds of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., had been deposited with the committee representing these bonds. There are eleven other classes of securities involved in the reorganization and of all classes together there has been deposited 83 per cent. One committee has yet to act on the plan before it is declared operative, after which it goes to the Indiana Public Service Commission for approval.

Under the terms of the plan, the securities of the companies to be merged will be exchanged for those of the Indiana Electric Corporation, an Insull company, the 5 per cent bonds of the Terre Haute, Indianapolis &

Eastern Railway receiving in exchange, par for par, a 5 per cent first mortgage and refunding gold bond of the Indiana Electric Corporation. This company has outstanding 6 per cent and 5½ per cent bonds under this mortgage, the former being quoted around 104 and 105. The Terre Haute, Indianapolis & Eastern 5s have continued to pay their interest and are quoted at about 89.

Expansion in Bus Business Improves Capital Traction Status

In his report to the stockholders for the year ended Dec. 31, 1926, John H. Hanna, president of the Capital Traction Company, Washington, D. C., states that it is encouraging to note that for the first time in several years an increase over the preceding year is shown in passenger revenue, accompanied by a slight reduction in operating expense. He said the gain in revenue was small and attributed it to the expansion of the bus business. Receipts from rail operation alone showed a slight loss. Net earnings for 1926 fell slightly under the requirements for a 7 per cent dividend, but the directors felt themselves justified in using undistributed surplus of past years to make up the small deficiency.

Net additions to capital accounts were $39,652. A credit of $63,821 to cars and car equipment was due to scrapping 122 obsolete cars and writing off the remaining ones to junk value.

On the subject of depreciation, the report states that the commission directed a change in the basis of accruing depreciation reverting to the lives of property and annual rates contained in the valuation order of September, 1919. Under the revised plan the company accruals through operating expense were $361,834, a reduction of $36,750 from the preceding year. The reserve increased during the year from $2,458,455 to $2,716,657. Tax accruals were $399,651, an increase of $13,407 from the preceding year.

Bus operations were carried on at a loss of $62,872. Mr. Hanna states, however, that this form of transportation renders an important service and the buses produce, as feeders, much revenue to the rail lines. No new lines were established nor any extensions made except the Hains Point sightseeing line in Potomac Park, operated in the summer only. This line showed a profit. Chartered bus business showed a substantial gain in gross and net revenue.

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDED DEC. 31

		1926	1925
Passenger revenue, railway..		$4,415,319	$4,482,040
Bus revenue..............		174,631	81,877
Special car revenue.........		48	60
Special bus revenue.........		3,822	95
Total revenue from transportation..............		$4,593,821	$4,564,073
Revenue from operation other than transportation.....		23,165	22,982
Railway operating revenue..		$4,616,986	$4,587,055
Operating expenses (66.70 per cent of gross revenue)		3,100,148	3,110,085
Net operating revenue....		$1,516,837	$1,476,969
Taxes assignable to transportation operations....		399,651	386,243
Operating income........		$1,117,186	$1,090,725
Non-operating income......		31,085	33,132
Gross income............		$1,148,271	$1,123,858
Deductions from gross income:			
Interest on funded debt.........	$280,300		
Interest on unfunded debt..	47,098		
Rent for leased road	13,692		
Income tax paid at source.......	4,317		
Total deductions.........		345,408	335,392
Net income..............		$802,862	$788,465
Profit and loss statement:			
Credits:			
Balance at beginning of year..	$1,478,246		
Net income for the year......	802,862		
Guaranty fund deposit with District of Columbia charged as an operating expense in prior years...	2,500		
		$2,283,608	$2,318,246
Debits:			
Dividends......	$840,000		$840,000
Additional federal income and other taxes for prior years...	32,967		
		$872,967	
Credit balance at close of year.................		$1,410,641	$1,478,246

REVENUE AND TRANSFER PASSENGERS CARRIED BY THE CAPITAL TRACTION COMPANY

	1926	1925
Railway passengers:		
Number of passengers carried at 8 cents..............................	17,719,054	16,995,347
Number of passengers carried at 6¼ cents..............................	43,128,140	45,066,128
Number of passengers carried at 5 cents..............................	830,780	833,352
Number of passengers carried at 3 cents..............................	383,007	345,131
Number of cash passengers carried on Kensington line..............	110,896	119,757
Number of ticket passengers carried on Kensington line..............	46,130	52,547
Total railway revenue passengers..............................	62,218,007	63,412,262
Bus passengers:		
Number of passengers carried at 25 cents..............................	343,899	71,466
Number of passengers carried at 10 cents..............................	64,814	1,160
Number of passengers carried at 8 cents..............................	310,085	252,588
Number of passengers carried at 6¼ cents..............................	528,022	466,617
Number of passengers carried at 5 cents..............................	60,511	640
Total bus revenue passengers..............................	1,307,331	792,471
Total revenue passengers railway and bus..............................	63,525,338	64,204,733
Other passengers:		
1-cent intercompany transfer passengers..............................	2,814,693	2,759,208
2-cent bus to car transfer passengers..............................	556,225	344,011
2-cent car to bus transfer passengers..............................	374,550	310,712
2-cent Eastern High School ticket passengers..............................	8	4
Free transfers passengers..............................	16,982,373	17,111,342
Other free passengers:		
Employees..............................	709,610	727,894
Policemen and firemen*..............................	52,295	56,714
Total passengers..............................	85,015,092	85,514,618

* Exclusive of policemen and firemen while in uniform.

Dividends Resumed in Duluth

The Duluth-Superior Traction Company, Duluth, Minn., has declared a dividend of $1 a share on its common stock, the first distribution to be made for some time on this issue. The regular quarterly dividend of $1 on the preferred stock was also declared.

Abandonment on Detroit United Line

Permission to abandon service on the Wyandotte and Trenton division of the Detroit United Railway, Detroit, Mich., has been granted the receiver, A. L. Drum, by William S. Sayres, Jr., master in chancery in the federal court. Service is being withdrawn and the tracks removed in order that the County Road Commission can carry out proposed paving operations south of Wyandotte. It was stated by the receiver that abandonment of service was due to financial losses attributed to jitney competition.

Abandonment of another branch of the interurban lines is urged in a petition made by the receiver, naming the Romeo-Imlay City branch, consisting of about 20 miles of trackage. A hearing on this proposed abandonment has been held before the standing master in chancery of the federal court and it was announced that a recommendation to abandon the line would be made to Judge Charles C. Simons. It was set forth that the line lost about $29,000 last year, due to lack of patronage and to competition of bus service, making it a serious drawback to the entire Detroit United system. It was Mr. Drum's opinion that if forced to continue in service this year the loss would probably be greater than that experienced previously. Citizens of Romeo, Imlay City and other towns along the route are to be permitted to voice their protests at a hearing to be held in the near future.

Sale of Morris County Traction Authorized

Sale of the property of the Morris County Traction Company, Dover, N. J., was authorized in an order signed on May 7 by Federal Judge Runyon. Elmer King, counsel for Joseph P. Tumulty and Joseph K. Choate, receivers, applied for the sale. The court named Charles F. Lynch, former federal judge, special master to conduct the sale. No date has been fixed for the sale. It will be advertised for at least four weeks.

Assets of the company will be offered in four lots. One will be the right to operate bus lines, another will include the right to operate railway lines and other rights under this franchise, the third lot will comprise the real estate and the fourth the personal property and equipment.

A minimum offer of $200,000 was fixed by the court in the sale order. This sum represents taxes and other priority liens. Any sum above that figure will be used to pay off some of the $3,750,000 in claims of mortgage and bond-holders.

Net Income Higher.—For the ten months period ended April 30, 1927, the total operating revenue of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $38,659,434, against $37,084,474 for a similar period ended the year previous. Total operating expenses increased from $24,158,645 to $25,095,326 in the 1927 period. After the consideration of income deductions, a net income remained of $5,188,965 against $4,631,470 for the ten months ended April 30, 1926.

One Line to Be Abandoned.—The line of the Warren Street Railway, Warren, Pa., operating between that city and the village of Sheffield, Pa., is to be abandoned, according to announcement made public by J. P. Fenstermacher, general manager at Warren of the Penn Public Service Corporation, which owns the line. The company also operates several loops in the city of Warren and an interurban line between Warren, Pa., and Jamestown, N. Y.

Net Income Lower. — For the four months period ended April 30, 1927, the passenger revenue of the United Railways & Electric Company, Baltimore, Md., was $5,424,915, against $5,510,614 for a similar period in the year previous. The net income was $242,228, against $281,708 in 1926.

Proceeds of Bonds for Bus Purchase.—In a supplemental order, the California Railroad Commission has authorized the Key System Transit Company, Oakland, Cal., to use $136,223 of the proceeds received from the sale of first mortgage 6 per cent gold bonds of series "D" to reimburse its treasury for the purchase of fourteen 26-passenger buses and other expenditures made prior to Dec. 31, 1926.

Would Suspend Service.—The Key System Transit Company has applied to the California Railroad Commission for permission to abandon car service between San Lorenzo Junction and East Fourteenth Street, known as the San Lorenzo branch line, in the county of Alameda. Abandonment is sought because the revenues are insufficient.

Partial Discontinuance in the Berkshires.—Through electric railway service between Bennington, Vt., and Hoosac Falls, N. Y., was discontinued on May 31 by the Berkshire Street Railway in accordance with orders issued by the Vermont Public Service Commission. This line was constructed 30 years ago by the Hoosac Falls Street Railway and was operated by that company until 1906, when it was acquired by the Berkshire Street Railway.

Surface Lines Traffic Shows Increase.—Increased riding on the cars of the Chicago Surface Lines has been reported for the twenty-third consecutive month compared with the corresponding month of the previous year. During April there were 132,604,753 riders, an increase of 1,151,854 over April, 1926, but a decrease of 4,422,574 below the preceding month. A total increase of 11,879,805 rides is shown for the first four months of this year. Divisible receipts of the companies after expenses, taxes and interest on purchase price in April were $398,114, against $387,898 in March and $308,417 in the corresponding month of 1926.

Book Reviews

Manual of Endurance of Metals Under Repeated Stress

By H. F. Moore, research professor of engineering materials, University of Illinois. New York, N. Y.: Engineering Foundation.

In 1919 the National Research Council, the University of Illinois and the Engineering Foundation joined forces to consider the problem of fatigue of metals. A number of industries cooperated in helping the undertaking by contributing funds, materials and information for the investigation. The information obtained has been collected, condensed and put in form convenient for engineering use. Most of the investigations are being continued and much research work remains to be done. Some work is needed of more fundamental character than any yet accomplished in order to determine the nature and the general laws of fatigue phenomena.

Some of the subjects treated include a historical review, machines and specimens for testing fatigue strength of metals, determination of endurance limits from data of fatigue tests, values of endurance limits for metals, stress raisers and fatigue failures in service. As the subtitle proclaims it, the book is a summary of views and test data, with instructions for their use.

Psychology of Selecting Men — New Second Edition

By Donald A. Laird. New York, N. Y.: McGraw-Hill Book Company. 345 pages. Price, $4.

This is the second edition of a scientific coverage of the fundamental consideration in selecting men. In this edition chapters have been added which point the way for the employment department to utilize definite tests in the selection of applicants. The contents include such headings as "Character Reading," "The Applicant's Industrial History," "The Limitations of Psychological Tests," and "The Emotional Make-up and Job Adjustment."

Doing Export Business

Compiled by Foreign Commerce Department of Chamber of Commerce. Washington: Chamber of Commerce. 64 pages. Price, 15 cents.

A new, concise, indexed guidebook for the American exporter has been published by the foreign commerce department of the Chamber of Commerce of the United States under the title "Doing Export Business."

Many manufacturers looking overseas for new markets have felt the need for some general survey of what considerations were actually involved in undertaking such a merchandising venture outside the United States. The apprehension of American producers over the intricacy and dangers of foreign marketing are allayed by the statement that:

> This class of business is similar in its main outlines to domestic business. Mastering the special requirements of export trade has not been found a difficult task by those who have set about it seriously.

The booklet then discusses the procedure necessary in surveying the export field, in establishing the export department, in promoting foreign sales and in filling export orders. The book's 185-item index indicates the comprehensive treatment of export business found within its 64 pages.

The Evolution of Overhead Accounting

Compiled by Department of Manufacture of Chamber of Commerce. Washington: Chamber of Commerce.

Fundamental principles to be taken into account by manufacturers in the proper treatment of overhead costs are set forth in a pamphlet, "The Evolution of Overhead Accounting," just issued by the department of manufacture of the Chamber of Commerce of the United States. It is intended to be useful to manufacturers in all lines.

"It is now generally recognized that overhead is the most important factor in cost accounting," the foreword states "Yet, until comparatively recently, even with improved methods in accountancy, the overhead content in the cost of a commodity has been roughly estimated or guessed at. Increasing competition, refinements in machinery and production methods and intelligence used in management have brought to the front the problem of more accurately measuring overhead."

Aware of the confusion among manufacturers over treatment of overhead, the chamber's department of manufacture has just completed a special study of the best methods of accounting procedure. The material developed is used as a basis for the pamphlet.

There are two divisions to the pamphlet. The first is devoted to the history of overhead accounting, showing various stages in the development of modern practice in such manner as to make clear the fundamentals in the accounting that are today recognized as important. Part second offers some suggestions to the manufacturer who wishes to improve his accounting procedure. E. W. McCullough, manager of the chamber's department of manufacture, announces that a copy of the pamphlet will be sent to any executive requesting it.

A Small Stockholder

By John T. Broderick. Schenectady, N. Y.: Robson & Adee. 127 pages. Price, $2.

Still another book has been added to the growing list of titles on investments and investment subjects intended for the general reader. This is auspicious, particularly since it is estimated that there are 7,000,000 stockholders in the United States, many of them small investors. There is no particular need, in a review of this kind, to go over the ground of the increasing growth of ownership in industry by the general public, but despite the lengthening list of books on investment intended for general consumption the subject has not been overdone.

The student of finance and the man of affairs might find the present volume too elementary for them, but there is a large class of investors, particularly employee-investors, who will find a perusal of its contents helpful and suggestive. And this is the class that needs the advice most. Having made a successful investment in the company with which he is connected, the employee often is easily intrigued into making other financial commitments which do not stand the test of time, either long or short. That is where the contents of this volume have their greatest value. One may or may not agree with the plan of the author suggesting a national association of stockholders, but one must agree, it seems, with the suggestion that the present volume is one that the individual employee-stockholder may well own to his own profit, and that the volume is one that should be on the shelves of the public libraries and in the reading rooms for employees. All this is said despite the fact that some statements of opinion in the volume are subject to challenge, not because they are understatements, but more because they are overstatements.

Facts and Figures of the Automobile Industry, 1927 Edition

National Automobile Chamber of Commerce. 96 pages.

In this eighth annual edition a number of facts and special studies are made available for the first time. Some interesting statistics, charts and maps are included to give the history of the automobile industry in the United States. The associations of that industry are listed with their main offices and officials. A motor bus table shows that electric railways and subsidiaries operated 7,284 buses as of Jan. 1, 1927.

Standards Year Book, 1927

National Bureau of Standards, U. S. Department of Commerce. 392 pages. Price $1.

The Standards Yearbook represents an effort to present an adequate picture of the diversification and ramification of the standardization movement which has spread throughout the world with astonishing rapidity during the 25 years that have elapsed since the establishment of the U. S. Bureau of Standards. It contains outlines of the activities and accomplishments of not only this bureau and other agencies of the federal government and the states and municipalities, but also of the American societies and associations of which standardization is a major or very important activity. As a companion volume to Commerce Yearbook, which deals strictly with industry and commerce, the Standards Yearbook deals strictly with standards and standardization. In this volume are correlated the essentials concerning standardization activities with which the Bureau of Standards is in close co-operation, and the subject of standardization is presented in its entirety. The Standards Yearbook will furnish the answers to a great volume of urgent inquiries received by the Bureau of Standards from manufacturers, industries experts, engineers and purchasing agencies, both governmental and general.

Forecasting Business Conditions

By Charles O. Hardy and Garfield V. Cox. New York, N. Y.: The Macmillan Company. 434 pages. Price, $4.

This book concerns itself with the study of those recurrent business maladjustments known as crises and depressions, considered not so much from the viewpoint of public economy as from that of the practical man of business and the investor. The book is made especially valuable by the study of the methods and forecasts of several well-known economic agencies, in so far as their work has to do with prediction of changes in general business activity. The various indices of production are discussed as well as the indices of employment, trade and business activity.

Tips on Leadership—Life Stories of 25 Leaders

By Herbert N. Casson. New York, N. Y.: B. C. Forbes Publishing Company. 224 pages. Price $2.

Men who aspire to become commercial magnates will welcome Mr. Casson's recipes for success in the business world. For some 60 pages he imparts hints on how to reach the top and wield the influence of the big business man. Then he tells the stories of 25 outstanding leaders who had a worthy purpose, were imbued with the spirit of independence and considered defeats as lessons. They are to serve as models for the impatient young American youth who, too, wants to become a leader.

If Mr. Casson appears to be platitudinous at times it is only because he, himself, has so firm a belief in the efficacy of these hints. His opening remarks on the necessity for quick decisions in a true leader are worthy of thought. He says: "A leader must reflect, he must plan, he must think. But he must not be like Rodin's 'Thinker'—sitting still and absorbed in his own reflections." Men intrusted with the management of utilities might read with profit his chapter "Reward Loyalty." Here are a few of his ideas:

> If an employer has men and women who have worked loyally for him for twenty years, and if he gives them nothing—no reward, no diploma, nor any sort of public praise, how can there be any loyalty in that firm?
>
> Are there not some firms that are forever changing their staff? Employees are always coming and going. Why? Because they are not fastened to the firm by loyalty.
>
> We have been hearing a good deal, in recent years, about labor turnover—the cost of new employees.
>
> We know now that a new employee costs from $50 to $200, what with the training and the loss by bad work and one thing and another.
>
> So you can see that loyalty is necessary and profitable. You can see that it is just as important as efficiency.

However, acceptance with considerable reservation is made of Mr. Casson's thoughts on learning to make news. That a leader must always be in full view and that no man can be a leader and a modest violet falls a little short of truth and idealism. "Be with the crowd and let them know where you are" is his tip for would-be leaders. Mr. Casson says: "If you have a dread of publicity, then sell out and live in retirement among your roses and rhododendrons and other dumb things." Not every one would consider roses and rhododendrons among dumb things.

The second part of the book contains an analysis of 25 personalities noted for their leadership. The list includes George Westinghouse, James Watt, Thomas A. Edison, Andrew Carnegie, Henry Ford, Elias Howe, Luther Burbank, Sir Isaac Newton and Thomas Huxley.

Occasionally the light and dark effects in Mr. Casson's pictures are a bit disconcerting. Doesn't Mr. Casson believe that more than Mr. Carnegie's heart would have been affected by the marriage of his daughter to a duke? Again, our credulity is strained when Mr. Casson remarks that Luther Burbank was so absorbed in work that he did not marry until the age of 71.

Undoubtedly the railway man knows a great deal of the life of George Westinghouse, but Mr. Casson's résumé will refresh his memory on the aspirations and accomplishments of that always earnest and ofttimes reckless pioneer. Besides, the author has something to say about "love in a railway coach."

"Tips on Leadership" is an earnest effort on the part of a leader in business in this country and abroad to put before aspirants "practical pointers on how to win leadership" His book purports to show the necessity for certain habit formations and character acquisitions if that goal is to be reached.

The "Electrician" Annual Tables of Electricity Undertakings, 1927

Benn Brothers, Ltd., London, England. 194 pages. Price, 10 shillings

This is the 40th edition, revised and containing details of several new undertakings, together with particulars of projected schemes. For the first time a comprehensive index covering the British tables A, B and C has been compiled and the Undertakings are not only set out in alphabetical order but the towns and even parishes receiving supply in bulk are also included. The contents show that colonial undertakings, foreign undertakings and British undertakings are included.

Corporate Resolutions

By Isabel Drummond. New York: Ronald Press. 321 pages. Price $6.

This volume is intended as a handbook for corporation executives, lawyers, accountants and others who are concerned with the management and operation of corporations. It combines a concise analysis of the law governing corporate resolutions, the medium through which corporate authority speaks, with annotated forms covering a wide range of corporate activity. There are 359 resolution forms covering stockholder's resolutions; directors' resolutions pertaining to internal transactions; directors' resolutions affecting third parties, and corporate notices. For convenience in use they are classified and divided into sections in accordance with the law governing stockholders' and directors' powers and the legal requirements concerning notice of action taken or to be taken.

Personal Items

C. O. Weidman in Guilford

C. O. Weidman was appointed general manager of the New Haven & Shore Line Railway, Guilford, Conn., on May 1. He entered the employ of what is now known as the Southern New York Power & Railway Corporation in 1898 and served successively as conductor, motorman, dispatcher and chief dispatcher. After a successful period in these rôles he was appointed superintendent of the property in 1906. Seven years later Mr. Weidman accepted an appointment as superintendent of the Morris County Traction Company, Norristown, N. J., resigning from that position in 1923 on account of ill health. During the next three years he was incapacitated and temporarily relinquished railway work. His next position was with the Altoona & Logan Valley Railway at Altoona, Pa., as superintendent in 1926. He was serving in this capacity when he resigned to accept the post of general manager of the New Haven & Shore Line Railway.

A. A. Hale, Griffin Wheel Vice-President

A. A. Hale, Eastern sales manager of the Griffin Wheel Company, Chicago, Ill., has been elected vice-president of that company. He will continue in the East, with offices in New York, in the capacity in which he has been serving, but with the added prestige which his election as a vice-president of the company carries. That prestige Mr. Hale has been building up with the company and in the steam and electric railway industry over a period of 22 years, for it was in 1905, just after his graduation from the University of Illinois as a mechanical engineer, that Mr. Hale went with the Griffin company.

He started at the bottom, a statement which in Mr. Hale's case means just what it says. The first title he had was mechanical inspector. Then came promotion after promotion, until in 1911 Mr. Hale was sent by his company to Boston as sales agent. For twelve years Mr. Hale circulated among the customers of the company who came under the range of territory included within the jurisdiction of that office. Then in January, 1923, he was sent to New York to represent the company and to operate for it with the title of Eastern sales manager. Few men in the steam and electric railway equipment field are better known than he. He was born in St. Louis, Mo., on May 1, 1883.

Promotions for Federal Light & Traction Men

At the monthly meeting of the board of directors of the Federal Light & Traction Company, New York, N. Y., J. Dunhill, who for many years past has been secretary and treasurer, and John D. Bowles, who for several years past has been chief engineer, were appointed vice-presidents of the company.

Among the subsidiaries of the Federal Light & Traction Company are the Hot Springs Street Railway, Hot Springs, Ark.; the Grays Harbor Railway & Light Company, Aberdeen, Washington, and the Springfield Railway & Light Company, a holding company.

Hugh Edwards Weyman Elected by Canadians

Hugh Edwards Weyman, manager of the Levis Tramways, Levis, Que., and well known in the manufacturing and operating end of the railway business, was elected president of the Canadian Electric Railway Association on June 2, 1927, at the annual meeting held in Winnipeg, Man. A year ago he was elected vice-president.

H. E. Weyman

Early in Mr. Weyman's career he was identified with the Westinghouse Electric & Manufacturing Company, where he took a special student's course, on the completion of which he was appointed foreman of the installation department and later general foreman of the insulation winding and transformer departments. On leaving the Westinghouse company he was engaged as foreman and later as general foreman at the armature winding shops of the Siemens Company, London, England. After some years with this firm he entered the services of the selling agents of the Gardner Oil & Gas Company, as sales engineer. His next position was general foreman of the electrical shops of the Canadian Allis-Chalmers Company, Montreal, and when this company was taken over by the Canadian General Electric Company, he entered the services of the St. Lawrence Bridge Company at the building site of the Quebec Bridge.

Leaving this company Mr. Weyman was engaged by the Levis County Railway and has been with it for the past ten years. During this time he has been responsible for the complete rehabilitation of the property, including the reconstruction of the track and construction of new car shops. Through his efforts the first installation of the Birney safety car in Canada was made.

Mr. Weyman was born in Guildford, England, on Aug. 27, 1883. He was educated at secondary schools and Cheltenham College and took the students' course in mechanical engineering and operation with the Great Central Railway.

Reorganization in Oakland

Departments of the Key System Transit Company, Oakland, Cal., have been reorganized, effective June 1, and what is sometimes called the "cabinet system" has been adopted. The changes in the internal organization of the company were made necessary by the resignation of George H. Harris as general manager and the abolition of that office. Under the new arrangement there will be five departments, the heads of which will report direct to Lester S. Ready, president. These departments will be known as and officered as follows:

Operating department, under James P. Potter, for many years superintendent of transportation. He will have charge of the operation of ferries as well as traction, Key division and buses. Capt. W. A. Rasmusen will remain as superintendent of ferries.

Engineering department, under H. P. Bell, who has been with the Key System for fourteen years and who has been chief engineer for the past two years. He will have charge of all construction and maintenance of tracks, equipment and ferries.

Financial department, under C. C. Vargas, who will have charge of all financial matters, auditing, accounting and purchasing. He is one of the youngest executives in the company and was formerly assistant to C. O. G. Miller when the latter was president of the Key System.

Public relations department, under Paul Goldsmith, who is a former Oakland newspaper man. Mr. Goldsmith will have charge of general public contacts, publicity, advertising and kindred matters.

Legal department, under W. I. Brobeck, Piedmont, as chief counsel and the firm of Brobeck, Phleger & Harrison in charge of general legal matters.

F. W. Frost remains as secretary and treasurer, positions he has held for 35 years.

Messrs. Davis and Boiselle in New Territory for Westinghouse Brake

E. W. Davis, for five years representative of the Westinghouse Air Brake Company at Boston, Mass., has been promoted to the position of Southwestern manager of that company with headquarters at St. Louis.

Mr. Davis was graduated from Purdue University with the mechanical engineering class of 1902. After several years of service with the Santa Fe and the Burlington railroads and a number of industrial concerns, including the Westinghouse Automatic Steam

Coupler Company, he entered the employ of the Westinghouse Air Brake in 1908. He was first an inspector, then assistant district engineer at New York. In 1919 he was promoted to be representative of the Westinghouse Traction Brake Company at that point. Since January, 1922, Mr. Davis has served as representative at Boston, a place which he relinquished to assume the more important duties in the Southwestern district.

Raymond Boiselle has been appointed representative of the Westinghouse Air Brake Company at Boston, Mass., succeeding Mr. Davis. Mr. Boiselle received his mechanical engineering education at the University of Illinois and early practical experience with the Missouri Pacific, Santa Fe and Rock Island railroads. Entering the service of the Westinghouse Air Brake Company in 1912, he was employed in the test department until 1917. During the World War he served as first lieutenant and captain, Aerial Armament Division, overseas, then re-entered the Westinghouse ranks as mechanical expert in the Southwestern district, where he remained until appointed representative in the Pittsburgh district in 1923. From this position he was transferred to the Boston office.

Harry G. Taylor has resigned as chairman of the Nebraska State Railway Commission to become director of public relations of the car service division of the American Railway Association, with headquarters in Washington. In addition to his other duties Mr. Taylor has served for several years as chairman of the Central Western Shippers' Regional Board, made up of shippers and railroad representatives, and one of the instruments by which better understanding has been secured between shippers and carriers.

John E. Curtiss, Lincoln, has been named a member of the Nebraska Railway Commission to succeed H. G. Taylor, who resigned to become manager of public relations for the car service division of the American Railway Association. Mr. Curtiss will take charge on July 1 and will serve until a successor is elected in November, 1928. Mr. Curtiss served for seven years as secretary of the commission, but left last fall to take a departmental secretaryship with the Lincoln Chamber of Commerce.

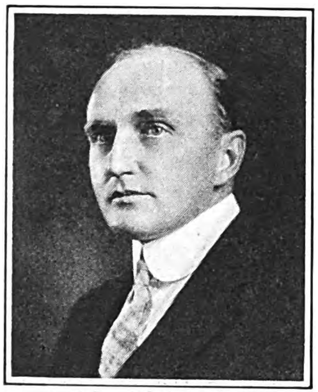
John B. Reynolds, former general secretary of the Indianapolis Chamber of Commerce, has been appointed director of the industrial development department of the Middle West Utilities Company, Chicago, the parent corporation for utilities in the Middle West, many of which are in Indiana, where Mr. Reynolds is well known. Mr. Reynolds was general secretary of the Chamber of Commerce for seven years, but retired in March after that body was reorganized.

James P. Neal, city attorney of Walla Walla, Wash., has been appointed to the post of supervisor of transportation in the Department of Public Works of Washington at Olympia. Mr. Neal replaces O. O. Calderhead, resigned.

Changes Among Mitten Men

Mr. Myers, P.R.T. President, Becomes Securities Official—Mr. Senter to Head Railway

W. K. Myers has tendered to the board of directors of the Philadelphia Rapid Transit Company his resignation as president, effective July 1, 1927, in order that he may devote himself entirely to the position of executive vice-president of the newly organized Mitten Bank Securities Corporation, which has been created as a vehicle through which to advance the Mitten principle of industrial democracy, and stock of which is now being offered to the public.



W. K. Myers

The announcement to this effect was followed by a statement by T. E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, on June 9 that he would recommend to the board the election of R. T. Senter as president to succeed Mr. Myers.

R. T. Senter

Mr. Myers was born in 1883 at Millville, N. J. He was educated in the public schools of Lancaster, Pa., and was graduated from Pennsylvania State College in the class of 1905. Mr. Myers was actively engaged in electric railway work in Chicago before he went with the Philadelphia Rapid Transit Company in 1919. Prior to his election as president at Philadelphia in 1926 he served as financial vice-president. He has the unusual distinction of combining an engineering training with a thorough financial education and experience. These attributes fit him eminently for the task of directing the destinies of the new corporation, in which the savings of small investors will be reposed.

Mr. Senter has been associated with Mitten Management for twenty-eight years. He is now vice-president of the Philadelphia Rapid Transit Company. Mr. Senter was born in 1876 in Columbus, Ohio. He was educated in the public schools of that city, Michigan Military Academy and the University of Michigan. He received his engineering education at Armour Institute of Technology and his practical experience with the Twin City Rapid Transit Company, International Railway, Chicago City Railway and Philadelphia Rapid Transit Company. During recent years he has specialized in electric railway car design, high-speed planning and subway-elevated construction.

ROSTER OF NEW INVESTMENT COMPANY

As for the newly-formed Mitten Bank Securities Corporation, the roster of its personnel has been announced. In addition to T. E. Mitten, president, and Mr. Myers, other officers of Mitten Bank Securities Corporation are: A. A. Mitten, vice-president; A. A. Chapman, secretary and treasurer; C. E. Ebert, comptroller; D. E. Brown, assistant treasurer. The board of directors is composed of T. E. Mitten, chairman; A. A. Mitten, vice-chairman; W. K. Myers, J. F. Schmunk, Mitten Management's accounting officer; R. T. Senter, A. A. Chapman, S. H. Stout, L. W. Hackett, J. F. Shivers, J. E. Wood, L. R. Skeen, E. H. Naudascher and W. R. Smith. The seven last named are elected representatives of P.R.T. employees.

H. W. Ross has been promoted by the Missouri Public Service Commission from assistant accountant to chief accountant. He succeeds T. J. Murphy, who resigned after thirteen years service with the commission to become connected with the Inland Power & Light Company, St. Louis. Mr. Ross has been assistant to Mr. Murphy for the past four years and prior to that was in the accounting department of the Interstate Commerce Commission.

A. J. Smuts, who has been in charge of the gas properties of the Wisconsin Traction, Light, Heat & Power Company in Neenah and Menasha for the past several years, will also have charge of the transportation properties.

W. H. Henby of University City, Mo., was elected president of the Missouri Association of Public Utilities at its annual meeting in Cape Girardeau, Mo., on May 7.

Charles W. Milner, of the law firm of Humphrey, Middleton & Humphrey, has been appointed assistant general counsel of the Louisville Railway, Louisville, Ky.

Ezra B. Whitman, formerly chairman of the Maryland Public Service Commission and now a member of the commission, has been reappointed to that body by Gov. Albert C. Ritchie.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Aluminum Car Body Material Shipped to Chicago & Joliet

The Chicago & Joliet Electric Railway, Joliet, Ill., announces the first shipment of aluminum materials for the cars that were to be constructed on the new worm-drive trucks, a detail description of which appeared in the JOURNAL for May 28. Shipment was made from Pittsburgh on June 1 and the balance of the material is expected this week.

"If nothing unforeseen happens," writes J. R. Blackhall, vice-president of the company, "we should have the body ready about Aug. 15, meantime the trucks are in daily operation, having operated about 2,000 miles without the development of trouble of any kind. The motors are performing satisfactorily, notwithstanding the fact that the car body on the trucks weighs about 8,000 lb. more than the new body will weigh."

Haskelite Extensively Used in Lindbergh Airplane

Haskelite plywood, used extensively in the aircraft field and well known in the automobile, truck, marine, bus, electric railway and sign industries, has added a new record to its string. In addition to being used in the Curtiss NC transatlantic planes in 1919, the Douglas world cruisers in 1924 and four Loening good-will planes just returned from South America, it has the honor of forming a considerable part of the structure of the Ryan monoplane used by Captain Lindbergh in his New York-Paris flight.

In the "Spirit of St. Louis" haskelite forms the entire wing structure and the leading edges and is used for almost the entire cabin, as well as other parts of the ship.

Essentials of Modern Car Discussed in National Pneumatic Book

What is an exceptional piece of publicity and at the same time a distinct contribution to the movement for new, or rehabilitated cars is to be found in "The Modern Car," a booklet recently released by the National Pneumatic Company, New York City. In a concise and highly illuminating text the modern car is discussed in its essentials.

First, one reads this splendid conception of the modern car:

> The modern car is one which earns a maximum return on its investment. It is not necessarily a new car. All new cars are by no means modern. Neither are all old cars perfectly obsolete. The modern car, in other words, may be either new or reconstructed, but it must be so constructed and equipped in other parts that it will add in return the highest monetary yield.
>
> It is not enough, for instance, to equip the car with a modern motor if a modern braking system is not simultaneously included. It is not enough to furnish comfortable seats if no simple consideration is given to the heating, light and ventilation. Nor is it sufficient if small wheels and a low floor are specified but no other provisions made for the safe and rapid interchange of passengers.
>
> In all such cases as partial improvement —where improvements can be totally or even partially offset by disadvantages— there is really no forward step. There is no gain in speed, for instance, if fast operation is canceled by slow retardation or delay in handling passengers. The car, in other words, must be completely modern, or it is not truly modern.
>
> New or rehabilitated, therefore, we define the modern car as a car constructed or rebuilt to include and properly combine all modern features of construction so as to derive the greatest benefit from all, when this benefit is measured in net revenue.

The booklet is effectively illustrated. It will be an interesting adjunct to the library of any one interested in the development of modern transportation.

Conference Recommends Remedies

Committee on Industry Summarizes Economic Situations—Pools and Cartels Finalized

BY EDWARD J. MEHREN

Vice-President McGraw-Hill Publishing Company, Inc.

CLOSING its session on May 23 after three weeks of continuous work, the International Economic Conference meeting at Geneva adopted a long series of recommendations on commercial and agricultural topics and three on industrial subjects. How speedily the recommendations can be translated into action, where definite action is proposed, cannot be foretold. Immediate results must not be expected. The issues would require much time even if only national action were required, but there are various agencies for forwarding the work, such as the economic section of the League of Nations, the International Chamber of Commerce, the International Institute of Agriculture, the International Management Institute, etc.

Not all the economic ills of the world were surveyed at Geneva. The pressing question of the disposal of surplus populations was not touched, due to the fact that it is too political. No attention was paid—or practically none—to the economics of distribution, to the problem of decreasing the spread between manufacturing cost and ultimate selling price. To this problem we are devoting much time in the United States. But, as it was, the agenda was crowded and many topics set down received no attention.

CONFERENCE SUMMARY OF SITUATION

In cable messages and previous articles summaries have been given of the economic situation as presented to the conference and of the resolutions which have been adopted. There remains here chiefly to give more completely the resolutions on industrial pools and rationalization.

Before doing so, it is worth while to give the readers of the ELECTRIC RAILWAY JOURNAL an opportunity of reading the conference's own summary of the economic situation, as set forth in the preambles of the report of the committee on industry.

Said the committee on industry:

> The chief difficulties now experienced result from the facts that in certain countries sufficient capital has not been available or that, with existing restrictions and under present conditions, the available markets are inadequate for the productive capacity in a number of the principal industries. This maladjustment results from many causes and takes various forms. There is a maldistribution of plant and equipment. In those countries which participated actively in the war, plant capacity in many industries was increased for military purposes beyond the scale of what is required in peace; in other countries, new plants were installed to produce goods which could not be imported during the war, and the experience of war deprivations has developed a desire on the part of a number of nations to make themselves self-sufficing. Moreover, the general impoverishment of Europe immediately after the war lessened savings and handicapped industry by reducing at once the purchasing power of its clientele and the possibility of financial assistance from European money markets.
>
> Other causes have tended to a new distribution of manufacturing equipment; certain discoveries, for instance, have brought about a change in the use of raw materials or in the utilization of sources of energy and a displacement of industrial centers. The normal development of certain repair and finishing industries in partially industrialized non-European countries and the effort in Europe itself on the part of certain nations with rapidly growing populations to increase their industrial equipment with a view to providing work for an ever-increasing number of individuals have operated in a like direction.
>
> The war indirectly increased the influence of these causes of instability. It increased the desire of various nations to work up in their own territories the raw materials they produced; it augmented the number and the magnitude of the obstacles placed in the way of the movement of goods by tariffs and prohibitions and of the movement of persons by immigration laws, by passport regulations and by restrictions on the right of establishment in the case of foreigners. Finally, the changes made in the structure of the economic organism as a result of alterations in frontiers, the laborious readjustment of international relations and the insecurity of the financial and monetary situation have further retarded or impeded the efforts by which the European nations have endeavored to restore order in their industrial economic life.
>
> Of these causes, some are no longer operative, though their effects may last after them. The danger of great immediate additions to equipment in industries where plant capacity is already excessive is slight in the principal industrial countries; the will to save is being revived and the supply of capital grows steadily; exchange fluctuations are now confined to a few currencies and within much narrower limits than heretofore.
>
> Other causes—which were noticeable before the war—particularly the growth of industries in hitherto only partially industrialized countries, etc., must be considered as permanent and in the new world situation susceptive of direction only within very restricted limits.
>
> It is on a third category of factors that the conference has had to concentrate its attention, namely, those which by their nature can, in existing circumstances, be appropriately modified. Of these the most important are the restrictions and control

of the movement of goods and persons and, above all, those which result from tariff and commercial policy.

Finally, owing to the growing facilities for transport and the constantly increasing number of raw materials required for industrial production, the natural development of industry is toward greater international intercourse and larger international enterprises.

In next week's issue will be carried Mr. Mehren's summation of the resolution on industrial pools and rationalization adopted by the conference.

Heavy Sales of Lead at Better Prices

Not in months has the lead market been so active as during the last week, practically all producers reporting an unusual demand. Total sales of zinc, too, have been unusually large, and prices have advanced another 17½ points. Prompt tin advanced a little, with reasonably good demand. Copper sales have not amounted to anything all week, but prices have held firm; in fact, being slightly higher now than a week ago. A little copper was sold at 12⅝ cents, delivered, June 2, but since then the level has been 12¾ cents, with 12⅞ cents and as high as 13 cents secured in the Middle West. Sales of zinc in the week ended June 8 have been the best in many weeks, June 2 being an especially active day. The London market has advanced proportionately the same amount as has the St. Louis market in the last two weeks. Spot lots of high-grade are nominally unchanged at 8 cents per pound.

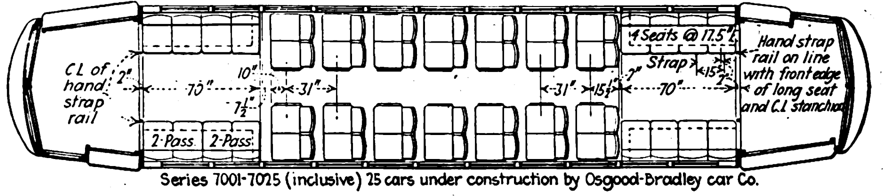
METAL, COAL AND MATERIAL PRICES F. O. B. REFINING

Metals—New York	June 7, 1927
Copper, electrolytic, cents per lb	12.52
Copper wire, cents per lb	15.125
Lead, cents per lb	6.42
Zinc, cents per lb	6.62
Tin, Straits, cents per lb	68.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.50
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.65
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb	14.50
Turpentine (bbl. lots), N. Y., per gal	$0.60

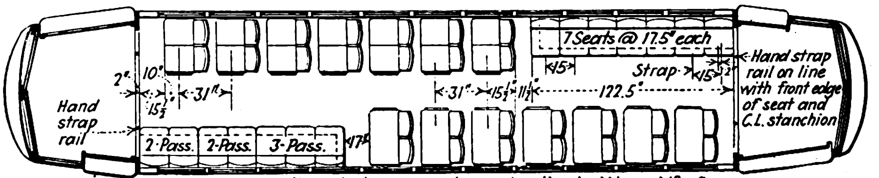
The domestic lead market suddenly and rather unexpectedly came to life late on June 1. The American Smelting & Refining Company has not increased its official contract price in New York from 6.40 cents, even though most of the business was done at 6.45 cents and 6.50 cents. The most active buying took place in the Middle West.

The tin market has been comparatively quiet, with prices steady, because of the limited supply of prompt metal on hand. This applies especially to Straits, which commands a premium of about 4 cents over 99 per cent; likewise, the prompt position enjoys an advantage of 3½ cents to 3¾ cents over futures.

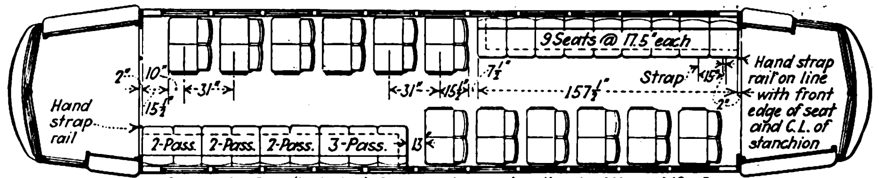
Delivery Progressing on Eastern Massachusetts De Luxe Cars



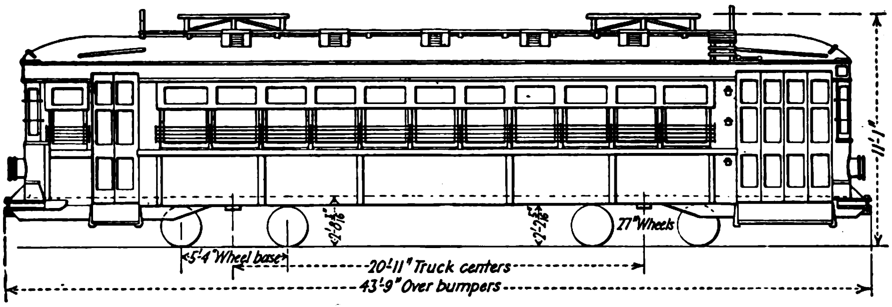
Series 7001-7025 (inclusive) 25 cars under construction by Osgood-Bradley car Co.



Series 7026-7040 (inclusive) 15 cars under construction by Wason Mfg. Co.



Series 7041-7050 (inclusive) 10 cars under construction by Wason Mfg. Co.



Patrons of the Eastern Massachusetts Street Railway will shortly be served by these de luxe semi-convertible units

Final specifications are available for the 50 de luxe semi-convertible, semi-steel cars ordered by The Eastern Massachusetts Street Railway, Chelsea, Mass., on Jan. 5, as noted in ELECTRIC RAILWAY JOURNAL for Jan. 29. The order was equally divided between the Osgood-Bradley Company, Worcester, Mass., and the Wason Manufacturing Company, Springfield, Mass. Each car has a seating capacity of 44 persons, and, as will be noted from the accompanying plans, there is a diversity in the seating arrangement not only between the Wason and Osgood-Bradley units but also in the cars constructed by the former company. Delivery has already commenced and is scheduled for completion on June 15. The details follow:

Number of cars ordered	50
Name of road	Eastern Mass. St. Ry.
Date order was placed	Jan. 5, 1927
Dated of delivery	Starting May 15, 1927; complete, June 15, 1927
Builder of car body	25 Osgood-Bradley Co., 25 Wason Mfg. Co.
Type of car	Semi-convertible passenger
Seating capacity	44
Weight, total (estimated)	35,000 lb.
Bolster centers, length	20 ft. 11 in.
Length over all	43 ft. 9 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 2$\frac{11}{16}$ in.
Height, rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	25 cars Agasote; 25 cars Haskelite
Roof	Arched, ⅞ in. Douglas fir
Air brakes	Westinghouse SM-2, with safety features and variable load device
Armature bearings	Plain
Axles	Standard Steel Co. carbon steel, 3½ in. x 6 in.
Bumpers	Hedley anti-climber
Car signal system	Faraday high voltage
Car trimmings	Statuary bronze
Center and side bearings	Brill
Conduits and junction boxes	Duratube and flexible metal conduit
Control	K-35KK, with hand switch
Destination signs	Hunter illuminated destination, side and front
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	Brill
Gears and pinions	General Electric grade M, long and short addendum
Hand brakes	Peacock-National Brake Co.
Heater equipment	24-600-watt Consolidated Electric Service
Headlights	12 in. Golden Glow with fixed focus
Journal bearings	Two cars equipped with Timken roller
Journal boxes	Brill
Lamp fixtures	Dome fixtures, compensated
Lightning arresters	Westinghouse MP
Motors	Four GE-265
Motors	Inside hung
Paint	Pratt & Lambert Vitralite enamel
Registers	International
Sanders	Osgood-Bradley traps, Westinghouse Type "C" sander valves
Sash fixtures	Osgood-Bradley and Wason
Seats	Heywood-Wakefield 327M, with deep cushions and divided backs
Seating material	Brown machine-buffed leather
Slack adjuster	American J-1
Springs	Brill
Step treads	Mason safety treads—Feralun
Trolley catchers	Wilson T-2
Trolley base	Nuttall US-20, roller bearing
Trolley wheels	Ideal, No. 40-A
Trucks	Brill 177-E-1-X
Ventilators	Utility New Era
Wheels	Bethlehem Steel 27 in. rolled steel
Special devices, etc.	¼ in. battleship linoleum flooring; dome lighting fixtures; cabinets inclosing platform piping, etc.
Power-saving device	Economy meters with inspection dials

Municipal Railway Splits $20,000 Trolley Wire Bid

Municipal Railway, San Francisco, Cal., received on June 2 bids on trolley wire to be used for the construction of the Judah Street extension of its lines. The Pacific States Electric Company and American Brass Company were the lowest bidders for the $20,000 contract. President Timothy A. Riordan stated that awards will probably be divided between the two concerns.

Mr. Riordan announced that within the next few weeks bids will be received for the trolley poles for the new Judah Street line, and also for the laying of ties. The ties have already been purchased.

"Miller Medal" Donated by Welding Society

The American Welding Society, through its president, F. M. Farmer, announces the donation of an award, the gift of Samuel Wylie Miller, to be presented by the society annually in appreciation of work of outstanding merit in advancing the art and science of welding. The award is a gold medal, which will be known as the Miller medal.

The donor has been one of the outstanding figures in the advancement of welding ever since its commercial inception. He is a past-president of the American Welding Society and a prominent and active member of the Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers and other scientific and engineering organizations. Mr. Miller is consulting engineer of the Union Carbide & Carbon Research Laboratories, Inc.

In establishing this award, Mr. Miller's object is to promote an appreciation of better welding and to encourage the study of those fundamentals which will lead to raising the quality of work done by the average operator.

Rolling Stock

The Terre Haute, Indianapolis and Eastern Traction Company, Indianapolis, Ind., has christened its latest interurban coach "Wiley High School." The car, which recently made a trial run from Terre Haute to Indianapolis and return, reveals a great improvement over other cars now in general service on the line. It was remodeled at the Terre Haute shops of the company. There are dome lights and special reading lamps for the seats. The seats are air-cushioned, non-reversible, covered with moiré plush. Mahogany finish and battleship lineoleum on the floors add to the general appearance of the car. The car has a maximum speed of 70 m.p.h., driven by four 100-hp. motors. It seats 51 persons.

A. E. R. A.

The Bidding is Brisk

85,909 sq.ft. of the de luxe show room space shown in the illustration below had been bid in on June 6 by 160 exhibitors, who were more willing to sign for than be assigned space at the big exhibit. This represents 26 more exhibitors and a 20,718-sq.ft. increase over the same date last year.

Virginia Electric & Power Company, Norfolk, Va., has placed ten new buses in operation in the Virginia seaside city, according to a recent announcement from the company's headquarters in Richmond. The new equipment is of the same type as that put in operation in Richmond in January.

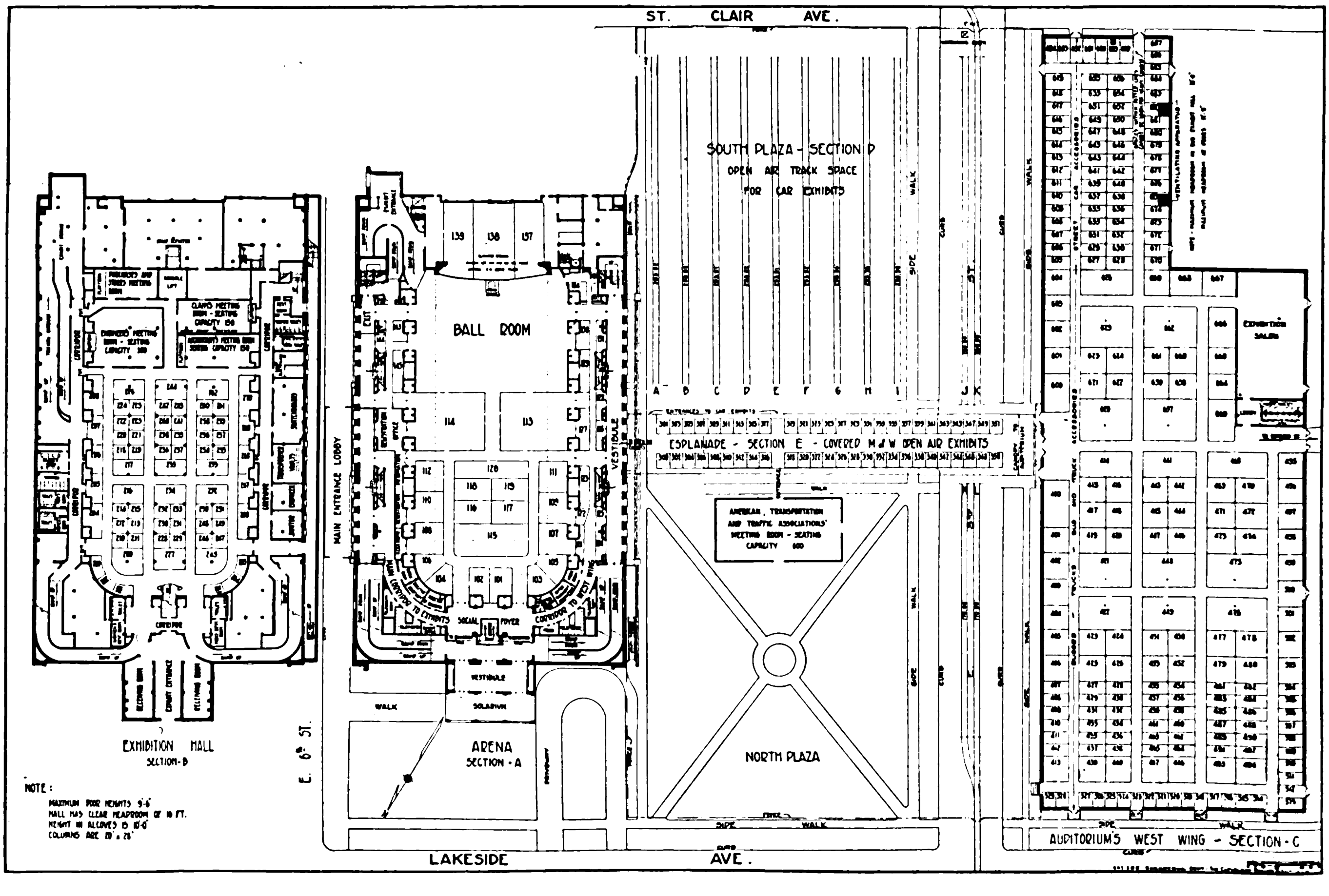
Public Service Transportation Company, Newark, N. J., bus operating subsidiary of the Public Service Railway, accepted delivery on sixteen Mack 29-passenger city type buses, six-cylinder motor, 233-in. wheelbase. These are a part of the original order for 147 buses.

Iowa Southern Utilities Company, Centerville, Iowa, has received from the Allentown factory of the International Motor Company two city type Mack four-cylinder buses, 25-passenger capacity.

Pittsburgh Motor Coach Company, Pittsburgh, Pa., has bought six Yellow buses. These are type X, 17-passenger parlor cars.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has purchased three Yellow buses. Two of these are 29-passenger city type and the third is a parlor car.

Wisconsin Public Service Company, Madison, Wis., has purchased four 21-passenger street car type Yellows.


ST. CLAIR AVE.
SOUTH PLAZA - SECTION D
OPEN AIR TRACK SPACE FOR CAR EXHIBITS
A B C D E F G H I J K
BALL ROOM
MAIN ENTRANCE LOBBY
VESTIBULE
ESPLANADE - SECTION E - COVERED M of W OPEN AIR EXHIBITS
AMERICAN, TRANSPORTATION AND TRAFFIC ASSOCIATIONS' MEETING ROOM - SEATING CAPACITY 600
EXHIBITION HALL SECTION - B
ARENA SECTION - A
E. 6th ST.
WALK
NORTH PLAZA
LAKESIDE AVE.
AUDITORIUM'S WEST WING - SECTION - C
NOTE:

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 18, 1927 *Number* 25

Use of Another's Idea Is a Mark of Ability

STRANGELY enough, among electric railway maintenance men there is a curious antipathy toward utilizing a method or device which has been developed on another property. Just what the cause of this feeling may be it is difficult to determine, but that it exists is common knowledge. Manufacturers' representatives who follow closely the maintenance practices of various properties are particularly conscious of the reluctance among maintenance men to admit the merits of the other man's ideas.

Even when visiting other properties with the expressed purpose of getting new ideas, there seems to be, somehow, a negative attitude. Each man tends to defend his own methods. He is inclined to shut his mind against what the other fellow is doing, instead of seeking actively anything good which he can apply.

No one man or group of men can hope to develop the best methods of handling the multiplicity of routine maintenance jobs that are encountered on a railway. Free interchange of experience and diligent search for new and better ways of doing an old job are safeguards against out-of-date methods. Use of other people's ideas is not a reflection on the ingenuity of the man who tries to apply on his property every idea which will increase efficiency, regardless of its source. It is quite the contrary as a measure of a man's ability as a maintenance executive. It is an indication of alertness, and if diligently followed out ultimately gives his property the benefit of the entire industry's cumulative experience.

Housing Type Axle Bearing Keeps Bearings Tight and Gives Longer Life

DEVELOPMENT of a housing type of axle bearing such as that used by Third Avenue Railway, New York City, and described in the May 21 issue, is of outstanding importance. The necessity for using a split type of axle bearing and a motor frame projection with an axle cap has made the operations of machining and clamping of axle bearings to keep the axle parallel with the armature shaft and to provide minimum clearances a trying problem. As the easiest solution, motor maintainers have been inclined to use loose axle bearing fits. These have proved dangerous to gears and pinions. Manufacturers of gearing have called attention repeatedly to the disastrous effects of spread gear and pinion centers in railway motors and to the decreased life that results when axles and armature shafts are out of parallel. They have a right to expect that gears and pinions will be operated with a minimum clearance for motor bearings so as to decrease the pounding and increase the mileage that results when gearing is kept in proper mesh.

The use of a housing type of axle bearing should permit these bearings to be operated with the small clearances found possible with armature bearings. The wedge key arrangement for holding the bearing should keep it tight in its housing and so do away with excessive wear at that point. By using a chuck of the same construction as the axle bearing housing for boring the bearing an accurate fit should result and parallelism between the armature shaft and axle be maintained.

The improved type of construction is also of advantage in keeping dirt and water from entering the bearings. These are two destructive agents that produce excessive wear.

How Can Definite Limits of Wear for Motor Fits Be Established?

MUCH helpful information on desirable limits of wear to assist in maintaining true gear-center distance for railway motors is given in the two articles by P. A. Pontius, the second of which is published in this issue of ELECTRIC RAILWAY JOURNAL. In a modern railway motor, he points out, there are ten places at which wear causes spreading of gear centers. The wear in service at these ten points differs widely and so the repairs to bring the fits back to the desired machining allowances come at different periods. At one overhauling perhaps only one of the ten surfaces has reached the limit of wear set as the condemning point. The others are worn but have not been worn to the limit. If they are allowed to go without repairs until the next overhauling they may be worn far beyond the maximum desired. When, then, should repairs be made? This is the complicated problem that must be solved by the maintenance forces.

As an aid in deciding how much a motor fit may be worn before repairs should be made, the author gives maximum limits for wear at each of the ten surfaces and recommends that each railway property keep records of the wear for these different points during the standard overhauling period. With such a record, limits can be established at which repairs must be made and the department head can be sure that the motor will run without danger until another overhauling period.

This is but one part of the investigation that is needed. The overhauling period used may not be so adjusted that it will come at a time when most parts require repair or scrapping. Accurate records of wear will help to determine this correct period.

This is the issue in June that is devoted essentially to maintenance and construction subjects

Proper maintenance of these motor parts should not end with repair or replacement, but an attempt should be made to improve the parts that have the shortest life so that they will last a multiple of the longest overhauling period. In the first article, desirable limits of wear were established; in the second, maximum machining allowances for proper repairs are given. Operators may use these as a basis for careful investigation of their service conditions with a view toward establishment of definite limits of wear based on recorded experience.

Take a Leaf from Canada's Notebook!

PROBLEMS of electric railways are not in any essential respect different in Canada from what they are in the United States, although with the severe winter conditions they are, if anything, more difficult. This was quite evident to any one who attended the Winnipeg convention this month. It is significant that the Canadian operators are giving fully as much thought to the developments of the day as are those on this side of the border. One of the topics which came in for a lively discussion was the treadle door. Railways large and small are finding that it makes practicable the use of one-man cars in many situations where it formerly has been considered necessary to continue two-man equipment.

Another significant discussion centered on the safety of various types of cars. Without exception it was the experience that the one-man car is safer than the two-man car. Not only do the safety devices which are incorporated in the modern one-man car make certain types of accidents impossible, but the centering of responsibility on the one operator eliminates confusion and the opportunity of blaming another for one's shortcomings.

The comments of the Canadian railway men carry the more weight in that the methods used by them have proved successful, if one can judge by the results. The survey of the properties throughout the Dominion made by the Canadian Electric Railway Association and published in ELECTRIC RAILWAY JOURNAL for May 14 indicates that during the past year business has increased on all but two of the roads that reported their results. Surely this is a record which indicates that the work of furthering modernization of plant and of methods carried on by the industry in Canada over the past several years is bearing fruit.

Simplification as a Means of Reducing Maintenance Costs

FOR some years Secretary Hoover's Division of Simplified Practice has been urging the elimination of unusual or unnecessary sizes and forms of products as a means of reducing waste and increasing the general efficiency of American manufacturing methods. Ray M. Hudson, chief of the division, has recently pointed out that manufacturers faced with the problem of steadily declining price levels can reduce production costs through elimination of the less popular sizes and varieties, with resultant saving in both production and distribution. It has been definitely proved, he says, that diversification adds both to production and to selling costs. While this has been surmised by all students of the problem for years, it is significant that Mr. Hudson has gone to the trouble of obtaining definite proof for it.

The same arguments that apply to manufacturing processes hold equally well for the railway in maintaining its plant. A diversification of equipment or of track construction can lead only to the multiplication of processes of repair, with resultant higher costs. Many of the most prosperous companies have but one or two standards of track and a like number of standards for cars. Perhaps it may be argued that a more judicious choice would be better for some particular route or piece of track. Be that as it may, the necessity of having diverse methods of maintenance fitted for the various types of construction will more than likely outweigh the advantages.

Even with old equipment it is possible to go far in the simplification of parts. As they wear out fittings of various sorts may be replaced with the company's standard. Motors or trucks of odd types may be retired to make way for others that are standard on the property.

Savings made in this way are of several kinds. Reduction of stock means that a lower inventory can be carried, and orders can be made larger, so that better prices and deliveries can be obtained. Repairs can be made more quickly and more accurately, as workmen are able to become more familiar with the limited number of processes developed for repairs. When the repaired cars go into service the chance of failure is lessened as the work is better done due to the concentration of effort on a limited number of types. The time a car is held out for repair is less, as it is seldom necessary to wait for a part to be ordered from the factory. With all these advantages, it behooves every maintenance man to investigate fully the possibilities of this attractive field for cost reduction.

Conference Leaders to Be Trained During the Cleveland Convention

ONE American Electric Railway Association committee whose activities have given tangible results in the last two years has been that on education. Last year, following several demonstrations of how to conduct a foremen's conference presented at several sectional meetings, the committee on education presented an actual foremen's conference at work before the American Association at the last Cleveland convention. This year it is planned to carry the work still further and provide an actual school operating four hours a day from Monday until Saturday during convention week at Cleveland, to which operating companies may send representatives to train for the work of conducting foremen conferences on their properties during the coming year.

At the meeting of the committee on education, reported elsewhere in this issue, it was decided to head the instruction group by H. H. Norris, educational adviser of the Boston Elevated Railway, and A. J. Sarré, occupying a similar position in the New Orleans Public Service, Inc. Tentative plans were also developed to call in the services of Frank Cushman of the Federal Board for Vocational Education, Washington, D. C. Messrs. Norris and Sarré are well known in the industry, having had many years of public utility experience to their credit. Mr. Cushman likewise is considered one of the best exponents on the conference method of instruction of foremen in industry as a whole. This triumvirate as leaders will not only do much to instill further interest into the foremen conference method of training for leadership, but it promises to do much more, as it will provide actual instruction for such men as come to learn how to conduct such conferences.

As planned, this group will be limited to 50 delegates and open to all member companies in the industry. It is expected that delegates who register will attend each of the six four-hour sessions in the mornings of convention week. With this program completed, it is expected that the foremen conference idea will take another important step forward in the actual work that should follow during the course of the year. It is gratifying indeed that this committee's activities have had so practical a result.

Satisfaction or Your Money Back

BUSINESS institutions in America as a whole have reached a level of honesty and idealism so high that today "satisfaction or your money back" has become a common motto. A dissatisfied customer has simply to state his claim and there immediately follows an adjustment. The desire to please has been recognized as a powerful factor in holding as well as securing patronage. As the result, claim or adjustment departments are a part of every well-organized industry.

In the majority of instances dissatisfaction may be proved in a tangible way. Whether one has purchased a paper of pins or an automobile the *modus operandi* of adjustment is comparatively simple. On the other hand, there are many things bought in the day's mart in which an intangible factor of dissatisfaction plays a major rôle, *per se*, the car ride. Few relatively cheap purchases present more claims of dissatisfaction or produce a greater adjustment problem than this popular form of transportation. For example: We may carry the passenger from A Street to Z Avenue—his desired destination. In the accepted sense we have fulfilled a contract, yet perhaps have failed miserably to create that sense of satisfaction that holds business. In short, we have been so engrossed in transporting a human being for a given distance that we have forgotten that that human being considers the distance traveled as only a minor part of the "commodity" purchased. We have forgotten that he who rides thinks. He is observing our unkempt rolling stock, indifferent and discourteous employees, uncomfortable seats, poor schedules and all the other inexcusable shambles which seem to shout lustily "the public be damned." Think for a moment! What would be the department store's chance for patronage if similar conditions obtained within its walls?

In all events, if such a condition exists on any utility, regardless of whether it has sold car-miles at a ledger profit or a loss, it has piled up an intangible debit that sooner or later will engulf all material gain. What is far worse, it has constituted itself a star salesman for private transportation. If we hold this view of our duty to the public we have forgotten also that the average passenger considers it a useless task to attempt an adjustment of his reactions. While elemental logic dictates that the company has from a material standpoint given him value received, he is nevertheless utterly dissatisfied. He immediately plans some sort of redress and he easily turns to the method made so simple by the price war of the automotive industry. He even considers "Shanks' mare" in the general plan.

How Far Have We Progressed in Adjusting These Claims?

THANK goodness, communities in which so depressing a complex exists as that mentioned in the preceding editorial are rapidly approaching a minority. Every issue of the JOURNAL carries numerous articles on new and rehabilitated equipment, on courtesy and modern management that sustain such an assertion. This is encouraging, but not the whole answer. While the industry is rapidly realizing the danger and has taken giant strides in the right direction, it has yet a final step to take in investigating the car rider's psychology. This step has been boldly taken by the Pittsburgh Railways and was concretely outlined before the Canadian Electric Railway Association by W. H. Boyce, commercial manager for the company. His discourse, "Development of Miscellaneous Revenue," abstracted in last week's JOURNAL, page 1055, read:

"The director of public relations is a liaison officer in relations with the police and fire departments, county detectives and other municipal representatives. He is also the clearing house for all complaints, commendations and suggestions from the patrons of the company. Whether these come in person, by mail or by telephone, no complaint is left unsettled. In the case of complaints by mail, personal visit at the home or office of the complainant is the regular practice. In other instances, where a laborer has been hunted up at his work, the employer himself has secured a new light on the earnestness of the management."

Here is the next and concluding step which will bring the electric railway industry to its new goal—mental and physical satisfaction per car-mile sold. To reach this goal we must continually have in mind the question: How far have we progressed in adjusting the passenger's intangible claims? "Satisfaction or your money back" must be included in the industry's creed.

Avoid Confusion by Keeping Records Up to Date

WITH the passage of time styles change in names as in all other things. "Smith's Corners" adopts the dressier cognomen of "Fairlawn." The old "Turnpike" becomes "Grand Boulevard." Cars which used to run on the "Crosstown" line now carry the more imposing designation "Broadway." Although it may be doubted whether all these changes are real improvements, they are of frequent occurrence, and the new names eventually become as well known as were the old.

Records kept by the electric railways are intimately connected with the names of towns and streets where the company operates. The way department has maps showing the position of its tracks. Often the line department designates its cables and feeders according to their location. The mechanical department may classify the rolling stock by the lines on which the cars are operated. When a street name or a route is changed, records should be altered to correspond.

Needless confusion results when different departments use different names for the same thing. If the transportation department wants 100 pads of transfers for the "Broadway" line, it should not be necessary to look on the "Crosstown" shelf in the store room. This sort of thing can be avoided if careful attention is paid to keeping records up to date.

Building and Maintaining Track in Salty Sand

In paved street the Atlantic City & Shore Railroad uses rigid construction with 9-in. grooved girder rail. In open construction 5-in. tee rail is used. To prevent rail corrosion sand is kept 1 in. below the tops of the ties

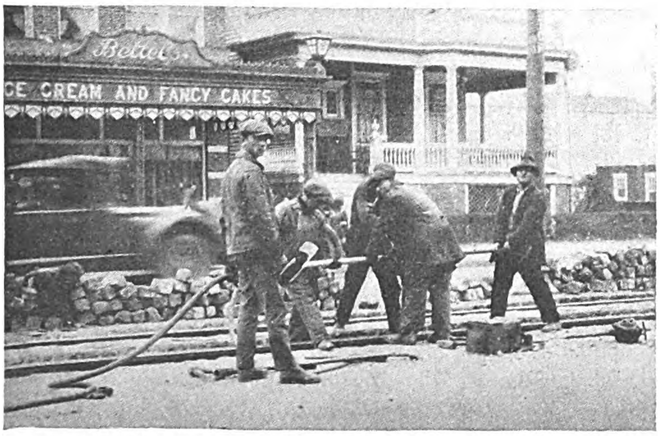
By R. I. D. Ashbridge
Chief Engineer Atlantic City & Shore Railroad, Atlantic City, N. J.

DESIGN and maintenance of track of the Atlantic City & Shore Railroad, Atlantic City, N. J., involve a number of unusual problems on account of ground conditions. The subgrade is salty sand and ground water is close to the surface. This necessitates particular precautions to prevent rail corrosion. Another element which has an important influence on the design of the track structure is the operation of steam railroad freight equipment over the same rails as the electric cars.

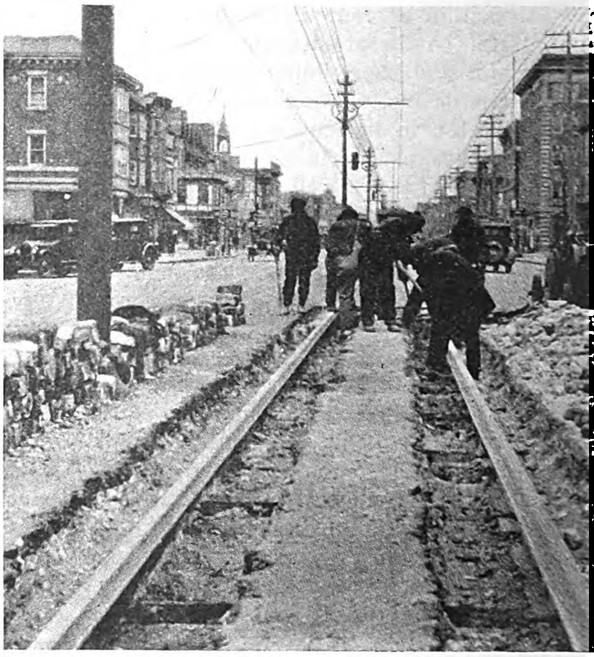
On Atlantic Avenue, the principal thoroughfare of the city, where the trunk line of the railway runs, the track is of the rigid type. Rails are 9-in., 141-lb. grooved girder Bethlehem section No. 263. They are laid with 15/32-in. tie plates on untreated long leaf yellow pine cross ties 7 in. x 9 in. x 8 ft. 6 in. Ties are spaced 2 ft. ¾ in. center to center. Under the track is a continuous 6-in. slab of concrete, with a 2-in. layer of broken stone under the ties tamped to bring the track to proper surface. The subgrade is a fine seashore sand. The ties and the lower part of the rail are incased in concrete.

The total depth of this track structure is approximately 24½ in., distributed as follows:

Rail	9 in.
Tie plate	$\frac{15}{32}$ in.
Tie	7 in.
Broken stone	2 in.
Concrete slab	6 in.
Total	24$\frac{15}{32}$ in.

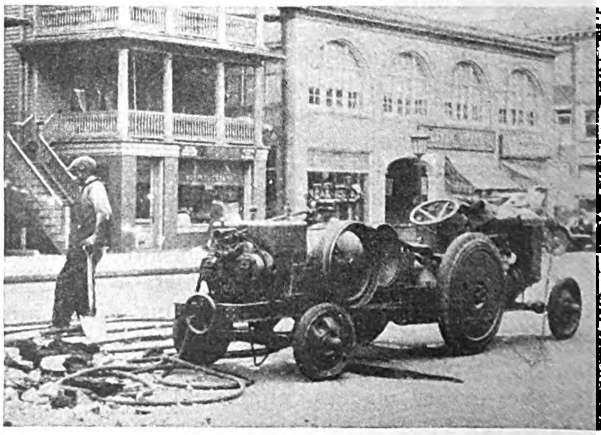


Pneumatic socket wrench is used to tighten the screw spikes used in Atlantic City



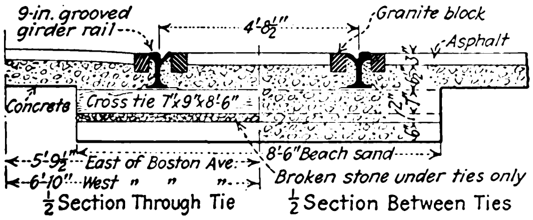
Opening up track on Atlantic Avenue preparatory to reconstruction

One row of granite block stretchers is laid along each side of each rail. A 1:2 Portland cement mixture is used as a filler between the rails and the blocks. Joints between rail and paving block are sealed with Genasco paving filler. Except for the area immediately along-

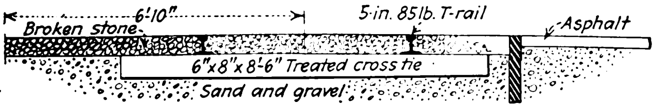


Air for pneumatic tools is obtained from a compressor mounted in rear of a Fordson tractor side the rail, where the granite blocks are laid, the paving surface is a 3-in. layer of asphalt laid on the concrete which incases the ties and the lower part of the rail. A cross-section of this track structure is shown in an accompanying drawing.

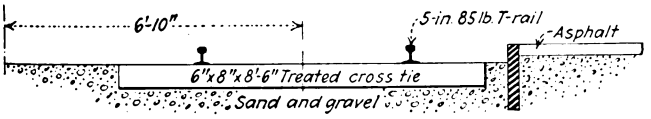
This track was built in 1906 in the manner outlined in the preceding paragraph. When it became necessary in 1924 to rebuild certain sections of the track a number of modifications were made in the design. This reconstruction work is still being carried on, as conditions require, according to the design adopted at that time.



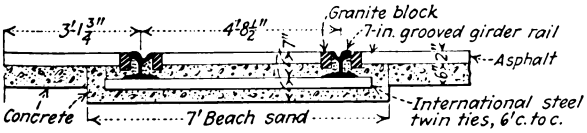
Rigid track structure on Atlantic Avenue has a total depth of about 24½ in.



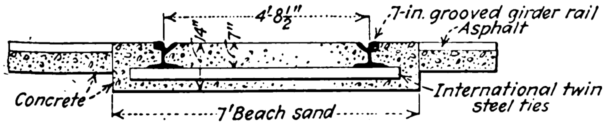
In the residential suburb of Ventnor tee rail construction is used, filled in with broken stone



In Margate and Longport the track is laid in an unpaved reserved strip in the center of the street


3'-1¾"
4'-8½"
Granite block
7-in. grooved girder rail
Asphalt
Concrete
7' Beach sand
International steel twin ties, 6' c. to c.

On Virginia Avenue, Atlantic City, the track structure has a depth of 14 in. with International steel ties



Monolithic construction in Ocean City with concrete paving in the track area

The process consists of opening up the pavement along both sides of the rail as far down as the tops of the ties, shimming up rails where necessary, drilling new holes in the tie plates and fastening the rails with ¾-in. screw spikes and cast-iron clips to the ties which are inclosed in concrete. Standard railroad cut spikes with chisel points formerly had been used. Trouble was experienced, however, from corrosion. In some places the base of the rail was eaten away to such an extent that the spike was no longer effective. This difficulty has been overcome by the use of the screw spike and iron clip. A pneumatic drill and auger are used to bore holes for the screw spikes and a pneumatic socket wrench to tighten them. The air supply for the pavement breaker is obtained from a compressor mounted behind a Fordson tractor and operated by the tractor engine. The drill, auger and socket wrench are operated by air from an electrically driven air compressor.

After twenty years of service the untreated pine ties on Atlantic Avenue are still in good condition. Approximately 10 per cent of the joints have become loose at one time or another, and the receiving rail become cupped. These cups have been built up by welding and grinding. During the reconstruction work where the rail ends have been found cracked by drilling or broken by the heat of welding, the joints have been cut out and 10-ft. "dutchmen" inserted. New plates have been installed where it has been thought desirable to strengthen the joints. In such instances cable bonds have been carried around the joints and buried in the concrete back-filling.

New granite block stretchers have been laid outside the rail. Old blocks which remain in good condition are laid along the inside lip of the rail. Cal is used in all concrete to hasten the setting of the cement and to prevent freezing in cold weather. As it is not possible to reroute the cars this work has had to proceed under traffic. During the summer season, from June to the middle of September, traffic is so heavy that the work has to be discontinued altogether.

On this track, where the 9-in. girder rail is used with the heavy concrete foundation, there has been a great deal of rail corrugation. This has been removed from time to time by means of rotary grinders, reciprocating grinders and grinding blocks attached to the underside of a car by heavy springs.

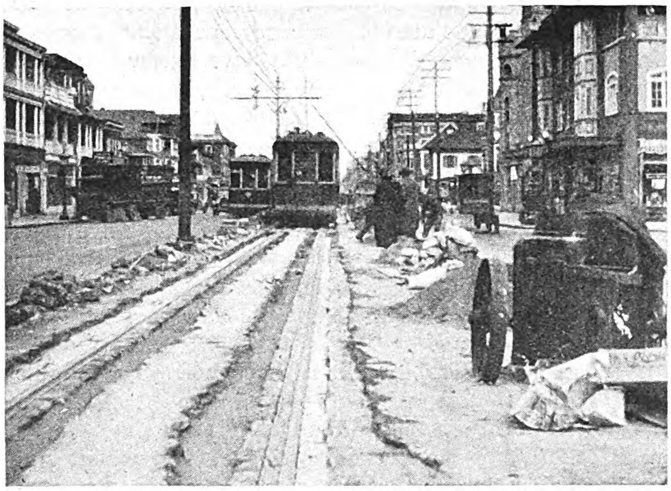
TEE RAIL USED IN OPEN CONSTRUCTION

In Ventnor, a residential suburb lying to the south of Atlantic City, the track structure of the Atlantic Avenue line consists of tee rail laid on treated ties. The subgrade is sand and gravel. By ordinance a layer of broken stone extending from the top of the tie to the top of the rail is required. Since the rail was laid in 1912 and this stone placed the crevices have been more or less filled with salty seashore sand carried by the wind. This has accumulated along the base of the rail and around the spike heads. A combination of vibration of the rails under traffic and arcing between rail and spike has cut away the base of the rail at the spike heads as far back as the web in some instances. For this reason the average life of the rail in this type of track is only about fifteen years, although the head remains in good condition for a much longer period.

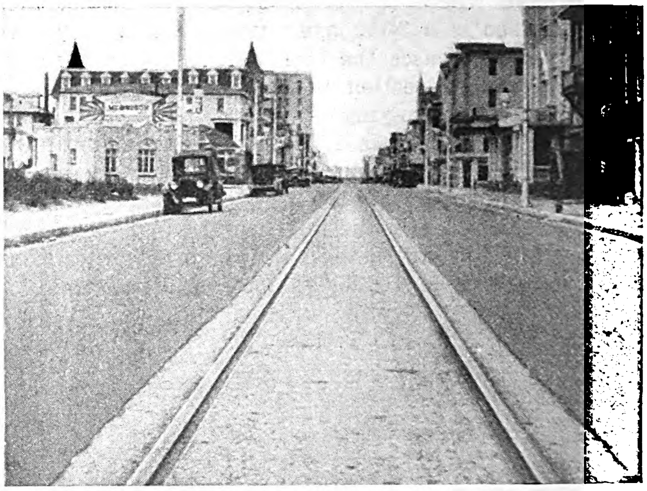
The adjoining municipalities of Margate and Longport have not insisted upon the filling of the track area with broken stone. Careful attention is given to keeping the sand about 1 in. below the tops of the ties. Track is laid practically on the beach at Longport, however, and it has been impossible to keep the base of the rail free of sand. Much trouble has been experienced from corrosion. Painting the rail with red lead has been tried in Longport, but has not proved altogether satisfactory. In spite of all precautions the life of rail averages only about sixteen years. In this atmosphere the joint plates corrode very rapidly and have to be replaced at frequent intervals, even though they are oiled from time to time.

STEEL TIES USED IN LATEST RECONSTRUCTION JOBS

During the spring of 1925 the double track on Virginia Avenue, Atlantic City, between the Boardwalk and Atlantic Avenue, was rehabilitated. This track is used by the multiple-unit interurban trains of the "Shore Fast Line." New 7-in. grooved girder rail was laid on International twin steel ties imbedded in con-



When reconstructing track in paved street, new granite block stretchers are laid outside the rail, while the old blocks are used inside

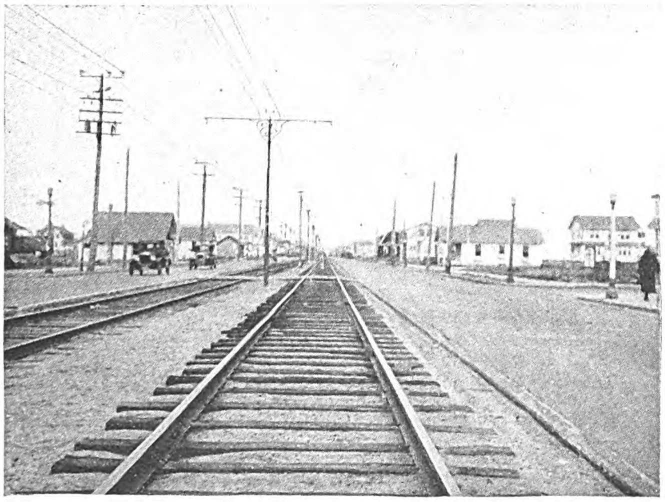


Monolithic construction with 7-in. grooved girder rail and concrete paving in the track area at Ocean City

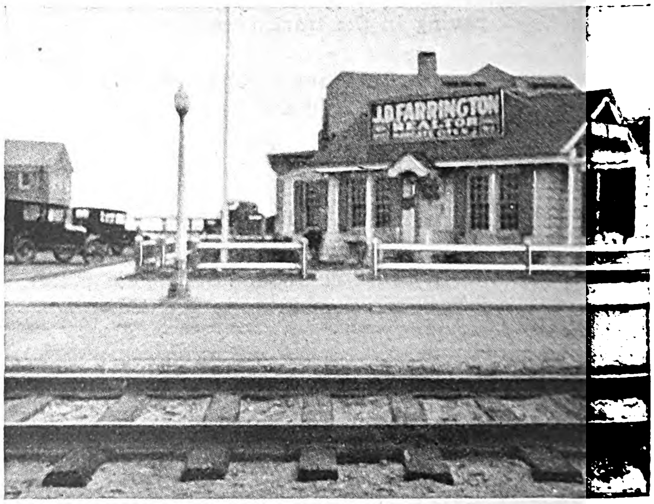
crete, in 62-ft. lengths, with the ends milled and undercut. Staggered machined joint plates 22 in. long are held in position by four heat-treated bolts as well as top and bottom seam welds. A 7-in. concrete slab was laid below the base of the rail. Granite block stretchers are used on both sides of the rails. Elsewhere the concrete extends to within 2 in. of the surface. Paving is sheet asphalt. Great care was taken in this work to ram the concrete thoroughly under the rails and the ties. The total depth of the track structure is 14 in. as shown in an accompanying drawing.

Single track on Eighth Street, Ocean City, from West Avenue to the Boardwalk, a distance of approximately 2,000 ft., was rebuilt in 1926. It had been laid in 1908 with 85-lb. A.S.C.E. rail on reinforced concrete girders, the rail being secured to cast-iron yokes with bolted clips. Due to frequent undermining for the installation of water and gas service pipes, electric conduits, etc., the track was in bad condition. Because the city desired to widen, repave and otherwise improve the street, the company consented to rebuild the track with 7-in., 128-lb. grooved girder rails. They are 66 ft. long, with ends milled and undercut. Joints have staggered 22-in. machined plates seam welded. As on Virginia Avenue, the rails are laid on International twin steel ties imbedded in concrete, which has a total depth of 14 in. In this instance, however, the street paving wearing surface in the track area is of concrete instead of asphalt. The slab was laid as a monolith, making the track structure as nearly rigid as possible. This type of track on Eighth Street, Ocean City, and on Virginia Avenue, Atlantic City, has proved very satisfactory so far. No sign of joint failure has been detected and the track is nearly noiseless.

On one of the subsidiary lines on the salt meadows between Atlantic City and the mainland, where there is not more than 6 in. of ballast between the sod and bottom of cross ties, and where the salt water from storm tides sometimes covers the track, it has been found that there is great difference in the life of the untreated cross ties used. Chestnut ties last only three or four years, while many of the short leaf pine ties have lasted 24 years, though badly cut under the rail. This is believed to be due to the absorption of salt. Untreated long leaf pine ties also have a long life in the same locality, though few have been used. Life of rails on this type of roadbed is comparatively short as the base corrodes very fast.



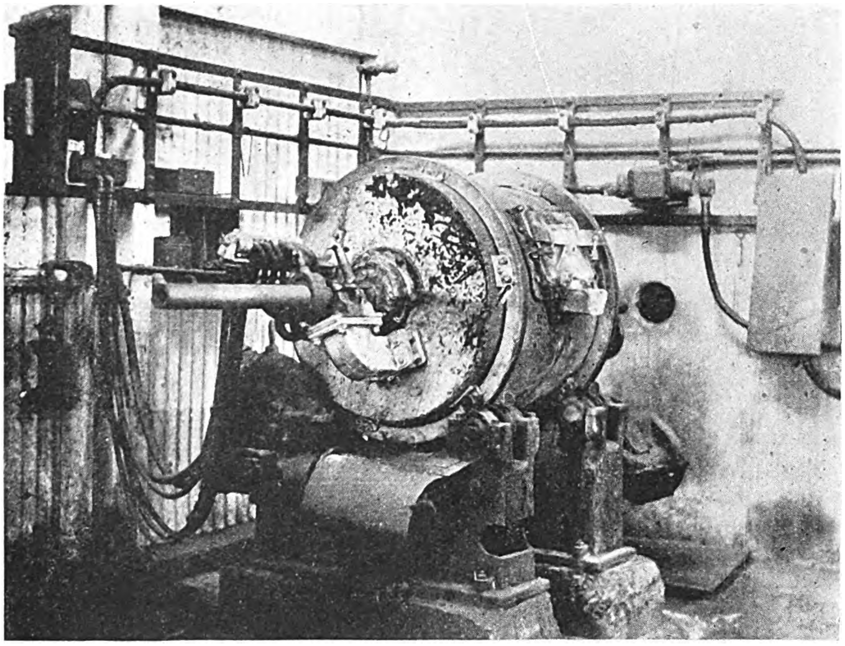
Open construction with 5-in. tee rail laid on creosoted ties is used in Margate



To prevent corrosion sand is kept at least 1 in. below the tops of the ties

Bearings Made of Lead Brass

Composition used by the Market Street Railway is said to have exceptional qualities—Reclaimed scrap totals four-fifths of the materials used in manufacture—Rapid methods used for machining cut cost without loss of accurate fits



Bearings, both axle and armature, are poured from an electric furnace.

BEARINGS, both armature and axle, are produced in the shops of the Market Street Railway at a cost which represents a saving of approximately $15,000 annually. This saving is the profit derived from operating the brass foundry, if castings were charged out at market prices such as prevail on the Pacific Coast.

Materials for the manufacture of the lead-brass bearing which is now standard on this property are, for the most part, obtained from scrap motor coils, reclaimed bearings, trolley ears, trolley wire and other parts of car and line equipment originally manufactured in the shops. Some new materials are required, but these total only about one-fifth of the amount which goes into the furnace. For the year 1926 the following quantities of scrap and new materials were used:

	Pounds
Scrap brass	77,814
Brass borings	189
Scrap copper	77,292
Scrap lead-brass (original castings)	25,907
Scrap lead-brass borings	47,144
Total (old material)	228,346
New copper	16.512
New tin	8,348
New lead	16,524
New zinc	2,113
New nickel	413
New material used	46141

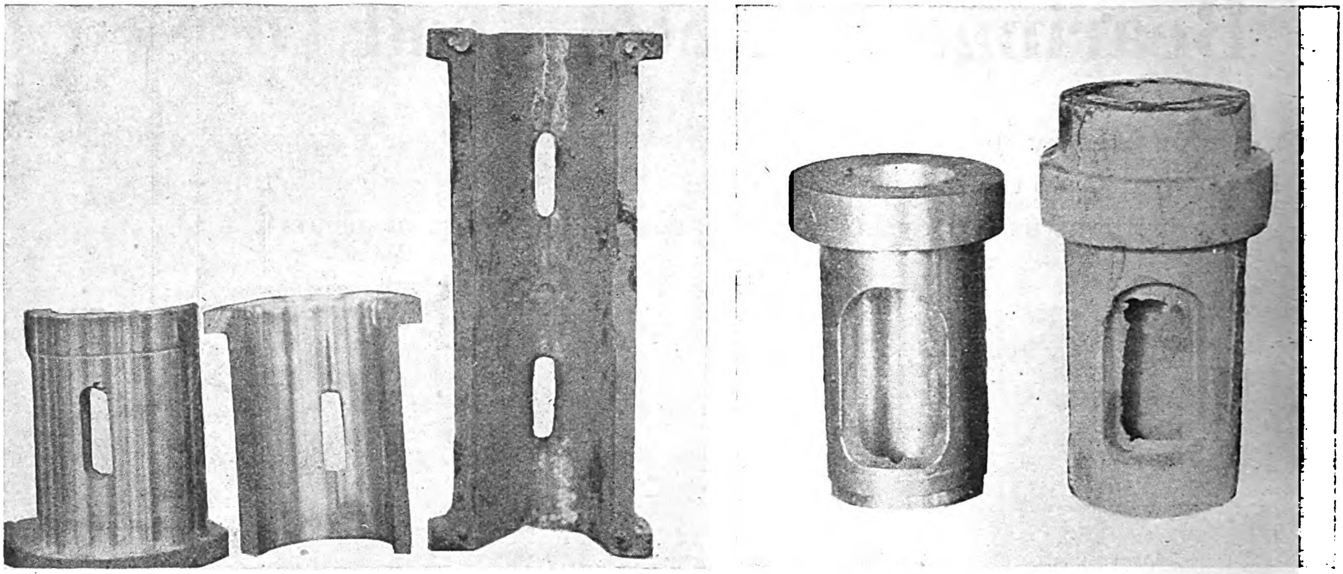
From these the following quantities of finished bearings, trolley ears and miscellaneous castings were manufactured:

	Pounds
Bearings	101,643
Trolley ears	23,671
Miscellaneous castings	50,171

Lead-brass was adopted for armature and axle bearings approximately two years ago. The replacement of the babbitt-lined bearings has been taking place since then and by the first of February, 1927, the entire equipment will be changed over from babbitt to bronze bearings. On motors equipped with the bronze bearings there has been only one armature down on the pole pieces in the past two years. This condition is a vast improvement over that which existed with the use of babbitt-lined bearings.

While manufacturing the bearings and other brass castings is on a small-quantity production scale, there is enough of this work to make it profitable. The composition of the bearings approximates closely the formula: Copper, 70 per cent; lead, 22 per cent; tin, 6 per cent. A slight variation is made for the manufacture of trolley ears and other castings requiring greater tensile strength than that needed in bearings. An electric furnace of the rotating type is used for melting the materials. This allows for a minimum of oxidation and results in a uniform pour which can be controlled accurately.

Axle liners are cast in pairs, end to end, with the flanges at opposite ends of the castings. Armature bearings are cast with an extended shoulder beyond the flange. These features facilitate the machining.



Castings for axle and armature bearings before and after finishing

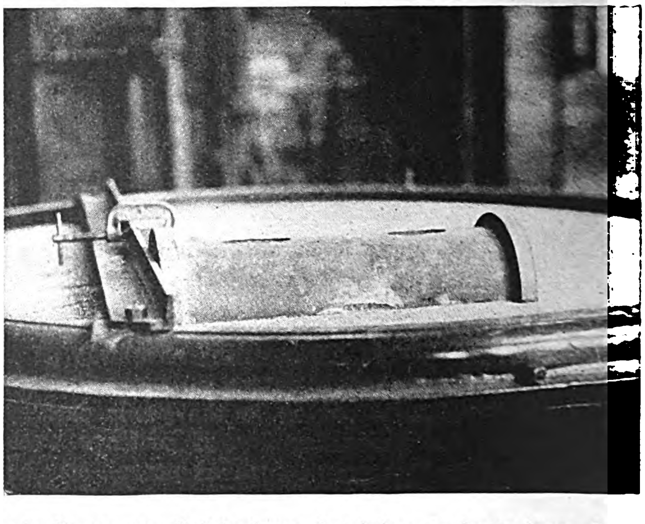
At the left, finished axle liners compared with the double castings, in which form they remain until after the outside surface is finished. The view at the right shows how armature bearings are finished both inside and outside at one operation on a turret lathe. An extension shoulder beyond the flange of the bearing serves as a means of holding the bearing in the chuck of the lathe until it is cut off at the flange after the various machining operations are completed.

Machine work on the bearings is preceded by a thorough cleaning of the castings in the sand blast room. After this the axle liners are finished off on the joint surface by a horizontal rotating emery plate. Formerly the finishing of these bearings required a planer and the services of a mechanic for approximately five days per week. Now the finishing is done in the spare time of the mechanic who operates the wheel grinding machine. Between the time required for setting up a pair of car wheels in the grinder the mechanic has opportunity to face off all of the axle lining castings needed to keep the machine shop busy with this work. A gage developed to meet the requirements of this grinding has simplified the work to a considerable extent. It is D shaped, with one end open to slip over the casting. The straight-edge is placed on the ground surfaces while the point gages up the outside of the curved casting. An allowance of $\frac{1}{16}$ in. over or under the gage is permitted.

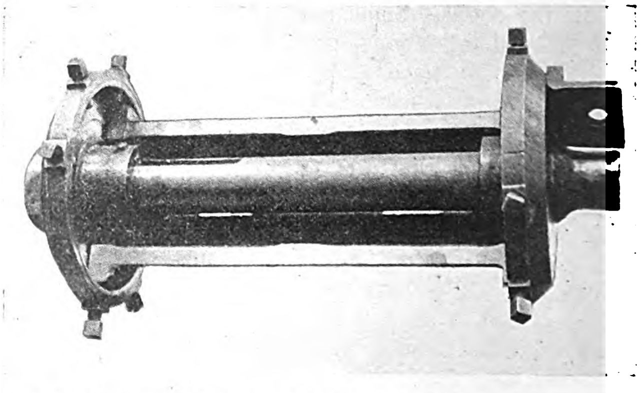
After the surfaces are ground two castings are mounted face to face in a jig provided with adjusting setscrews so that the split will come at the exact center. This aligning of the castings is important in the finishing of axle linings on this property. An illustration of this jig with only one double casting in place shows how they are lined up. With two double castings held together in this manner the outside surface is finished up to and including the inside edge of the flanges. The two castings are then cut in halves to form two pairs of axle linings which are so exactly matched that any two finished linings will match up for a complete bearing.

Pairs of axle linings with the outside finished are clamped in a taper chuck with the flanged ends out and finished ends on the inside. The outside end of the flange is also finished, the fillet being cut between the inside bore and the flanged surface. The oil grooves are cut by hand.

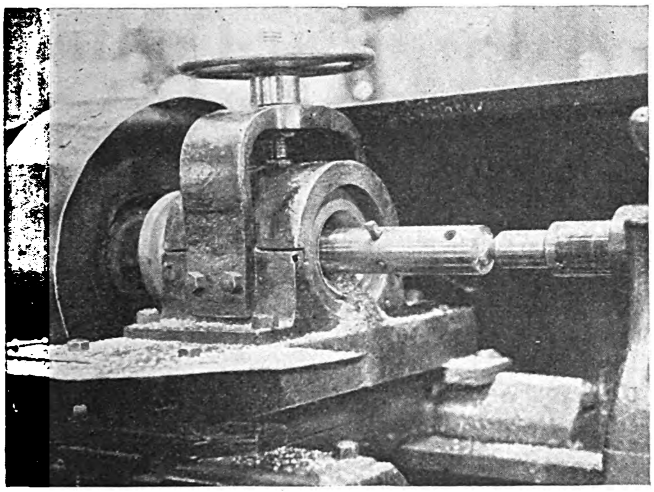
Four sizes of axle linings are made to fit into the various types of motors used. In addition, three varia-



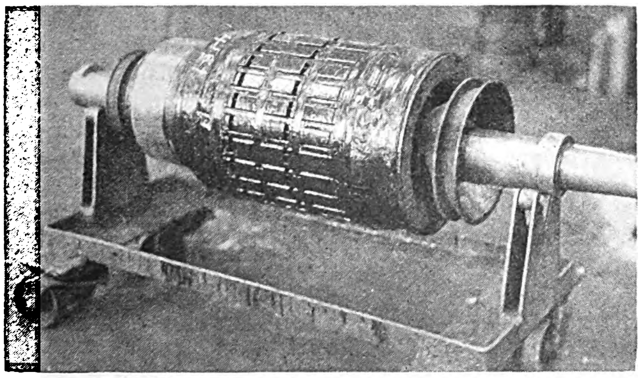
Axle liners are finished on the joint surfaces by a horizontal rotating emery wheel. The use of this wheel has saved the services of a shaper and a mechanic for five days per week



A jig holds two double axle lining castings face to face while the outside surfaces are finished. Gage lines, in the heads of the gage, center the split of the bearings so that any two halves match accurately



Final finish and fit are given the armature bearings in this fixture. A shaft clearance of 0.013 in. is allowed



Armature equipped with lead-bronze bearings used in the motors of the Market Street Railway, San Francisco

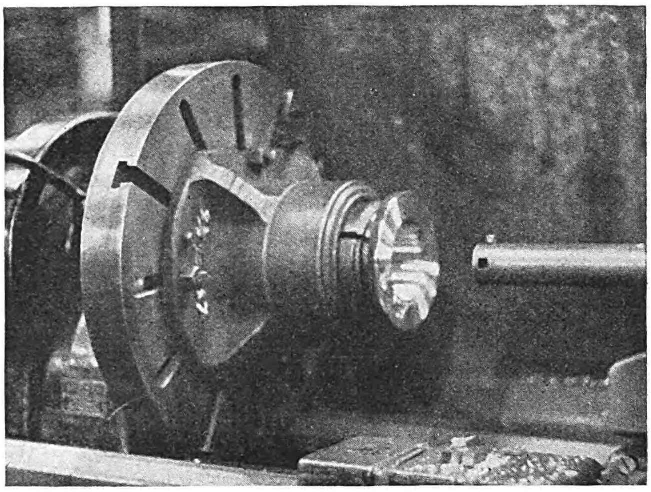
tions in inside bore of the four types are made to accommodate under-size axles. Finished axle bearings are marked in pairs and motor type number and size of axle stamped on the ends. They are placed in the storeroom to be drawn out on requisition.

Armature bearings follow a somewhat different process. The extended collar cast on the flanged end is held in the chuck of a turret lathe while the bearing is finished inside and outside in one operation.

The inside is bored the full length of the casting while the outside finish is carried up to the flange shoulder. The flange and end groove on the flange are finished, after which the bearing is cut away from the shoulder held in the chuck. Five types of armature bearings for both commutator and pinion ends are made. These are also bored in three sizes, namely $\frac{1}{8}$, $\frac{3}{16}$ and $\frac{1}{4}$ in. small. This allows for variations in armature shafts.

Final fitting of the armature bearing to the shaft is done by the armature department. The bearing is finish bored 0.013 in. larger than the shaft. Bearings are placed on the shaft and the pinion pressed on. The armature is placed on a rack pending installation.

Quantities of 100 bearings of the various types and sizes are manufactured at a time. This keeps the machines operating under what might be termed, in a small way, quantity production. It allows for economical performance and of course has been a factor in reducing the ultimate cost of the bearings.

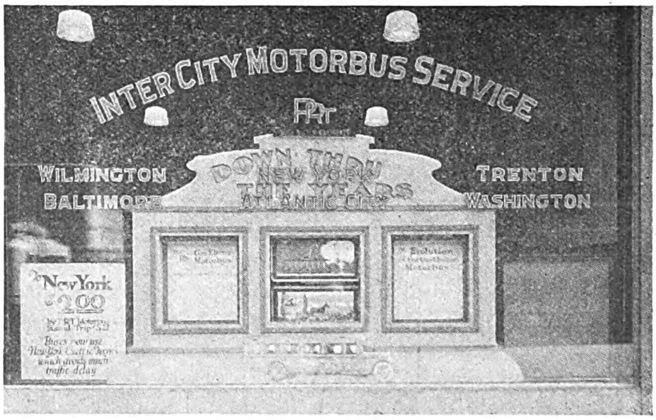


Two halves of axle lining with the outside finished are held in taper chuck for boring on engine lathe

Transportation—A Study in Evolution

FOR several weeks in the window of the Philadelphia Rapid Transit Company's intercity motor bus terminal on South Broad Street, Philadelphia, appeared a rather unique transportation exhibit. It consisted of a series of artist's impressions of the various stages of transportation, starting with the caveman, who had to depend largely on his own legs to get over the ground, and covering progressively the chariot, the cart, the horse car and similar intervening stages until the modern gas-electric bus was evolved. The pictures were mounted on a device operated by an electric motor and which exhibited the scenes successively.

Electric lights, arranged behind the beaverboard frame of the exhibit, lighted the pictures and the cards of explanation on either side. Considerable interest was evoked by the passersby on Broad Street and while the device was in operation a large crowd was generally gathered in front of the window. The South Broad Street office is the terminal for the P.R.T. intercity bus routes to New York, Wilmington, Baltimore, Atlantic City, Trenton and Washington. De luxe, gas-electric parlor car buses are used on all of these runs and the recent exhibit was designed to show that these vehicles are the last word in safety, comfort and efficiency in public transportation.


INTER CITY MOTORBUS SERVICE
PRT
WILMINGTON
BALTIMORE
TRENTON
WASHINGTON
DOWN THRU THE YEARS
NEW YORK
ATLANTIC CITY
New York
$2.00
Buses now use New York traffic lanes which avoids much traffic delay

P. R. T. tells a pictorial story of transportation through the years by means of this interesting device, located in the window of its intercity motor bus terminal, South Broad Street, Philadelphia

Correct Motor Repairs Keep Gear-Center Distance Accurate*

The ten surfaces on which wear will cause spreading of gear centers should be brought back to correct dimensions at each regular motor overhauling

By P. A. Pontius

**Renewal Parts Engineer Westinghouse Electric & Manufacturing Company,
East Pittsburgh, Pa.**

WHEN a motor has been taken out of service for overhauling, the question arises in the maintenance man's mind as to how the motor parts which affect the gear-center distance can be repaired and as to the proper machining allowances. This question is answered in the present article, in which the ten surface members under consideration are the same as those mentioned in the previous article. In regard to some of the terms used in this article the following should be noted:

1. *Nominal dimension* (in inches and fractions) is the theoretical or nominal standard to which the allowances have to be added or from which all variations are made.
2. *Basic dimension* is the theoretical or standard size from which all variations are made. The basic dimensions will include the allowances for fits.
3. *Limits* are the specified maximum and minimum dimensions permissible for any part.
4. *Tolerance* is the permissible difference between the limiting dimensions.
5. *Variation* is the limited deviation above or below the basic dimension that can be tolerated.
6. *Allowance* is the prescribed difference between the dimensions of mating parts to provide for various classes of fits.

Example: A bearing is to be pressed into a housing. The nominal dimension for both the outside diameter of the bearing and the housing bore should be 4¼ in. The dimensions should be specified on drawings as follows:

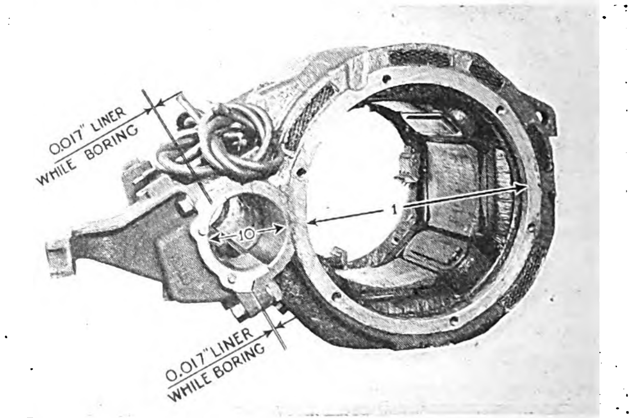
Outside diameter of bearing, 4.254 in. $\left\{\begin{matrix}4.254\\4.252\end{matrix}\right.$

Bore of housing, 4.249 in. $\left\{\begin{matrix}4.249\\4.251\end{matrix}\right.$

Nominal dimension, 4¼ in.
Basic dimension of bearing is 4.254 in.
Basic dimension of housing is 4.249 in.
Limiting dimensions of the bearing, 4.254 in. and 4,252 in.
Limiting dimensions of the housing, 4.249 in. and 4.251 in.
Tolerance of bearing is 4.254 in. minus 4.252 in. = 0.002 in.
Tolerance of housing is 4.251 in. minus 4.249 in. = 0.002 in.
Variations of bearings are 0 — 0.002 in.
Variations of housing are 0 — 0.002 in.

If the wear of the housing seat in the steel motor frame has progressed so far that a new or repaired housing will not fit tightly, the frame should be welded by adding new material and the housing fit should be bored to the same dimensions as on the new motor or, without welding, the frame should be rebored to a diameter larger than standard. However, before doing this the quality and thickness of the material surrounding the housing seat in the frame should be determined to make certain that the casting will have sufficient strength after reboring. Worn bolt holes and dowel holes in the frame should be welded and drilled.

In specifying allowances for the housing fit in the frame it is necessary to distinguish between box frame and split frame motors. The calipered dimension of the standard or oversize diameter of the housing seat in box frame motors should be within the limits of plus 0.00 in. to minus 0.002 in. of the nominal dimension. The necessary clamp fit in the housing seat of the split frame motor is obtained by placing single 0.017-in. liners at the split of the frame halves during machining and removing them afterward. With these liners in place the housing seat should be bored to standard or oversize diameter within the limits of plus or minus 0.001 in. of the nominal dimension. These allowances and variations should also be used for the bearing seat in the split frame motor without housings.



Housing and axle bearing seats in box frame motor

Worn housings which do not fit tightly in the remachined frame housing seat can be welded with little if any trouble except on housings of malleable iron. Sufficient material should be added by welding to finish the outside diameter on the housing to standard size or larger, depending on the bore of the housing seat in the frame with which it is to be used. Worn bolt holes, dowel holes or key seats in the housing should be filled by welding and remachined. Housings made from malleable iron or other materials can be repaired by shrinking on a steel ring. The housing has to be machined for the proper seating of the ring and the ring must be finished after it is shrunk on in place, the same as for the welded housings. If neither of these two methods is applicable, a new housing with standard or oversize frame fits is necessary. A worn oversize housing can be machined to standard size and used in a new, repaired or unworn frame housing seat.

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*This is the second of two articles on proper allowances and repairs to keep gear-center distance of railway motors accurate. In the first article, published in the issue of ELECTRIC RAILWAY JOURNAL for May 21, motors in service were considered and limits were given for wear.

The allowance for the frame fit on the housing is different for the various materials used in the housing and depends mainly on the strength and elastic limit of the material. The nature of the surface finish and size of contact area of the surfaces fitted together should also be considered. The allowances which will be given for different outside diameters are for malleable iron housings. The character of the surface finish is assumed to be the same as on new motor parts, i.e., a good average finish. The necessary allowances for a tight fit are as follows, considering the conditions outlined above:

	Nominal Diameter
(A) For housings used in box frames:	
Up to 7 in. diameter	+0.002 in. +0.004 in.
Above 7 in. to 21 in. diameter	+0.003 in. +0.005 in.
Above 14 in. to 21 in. diameter	+0.004 in. +0.006 in.
Above 21 in. to 28 in. diameter	+0.005 in. +0.007 in.
Above 28 in. to 35 in. diameter	+0.006 in. +0.008 in.
Above 35 in. to 42 in. diameter	+0.007 in. +0.009 in.
(B) For housings used in split frames:	—0.000 in. +0.005 in.

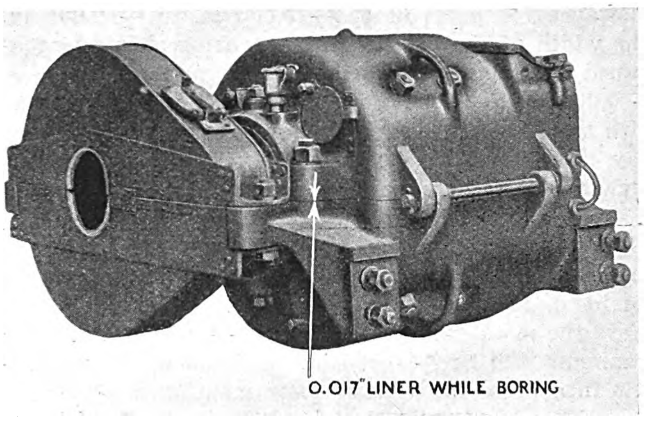
The above allowances are suitable for malleable iron. A smaller allowance is required for cast-iron housings, for a smoother finish and for a wider contact surface. Cast-steel housings, rougher finish or a narrower contact surface may require more allowance for press fit in box frame motors.

The following minimum and maximum allowances for malleable iron housings in box frame motors may be obtained:

	Minimum	Maximum
Up to 7 in. diameter	0.002 in.	0.006 in.
Above 7 in. to 14 in. diameter	0.003 in.	0.007 in.
Above 14 in. to 21 in. diameter	0.004 in.	0.008 in.
Above 21 in. to 28 in. diameter	0.005 in.	0.009 in.
Above 28 in. to 35 in. diameter	0.006 in.	0.010 in.
Above 35 in. to 42 in. diameter	0.007 in.	0.011 in.

A small chamfer on the housing and frame will assist the assembly of the housing with the frame.

Bolts holding the upper and lower halves of frame together provide the necessary clamp fit of the housing in a split frame motor. A gap of 0.016 in. minimum and 0.023 in. maximum between the two halves of the frame gives sufficient clearance that the clamping bolts can exert the necessary pressure on the housings at the frame seat.

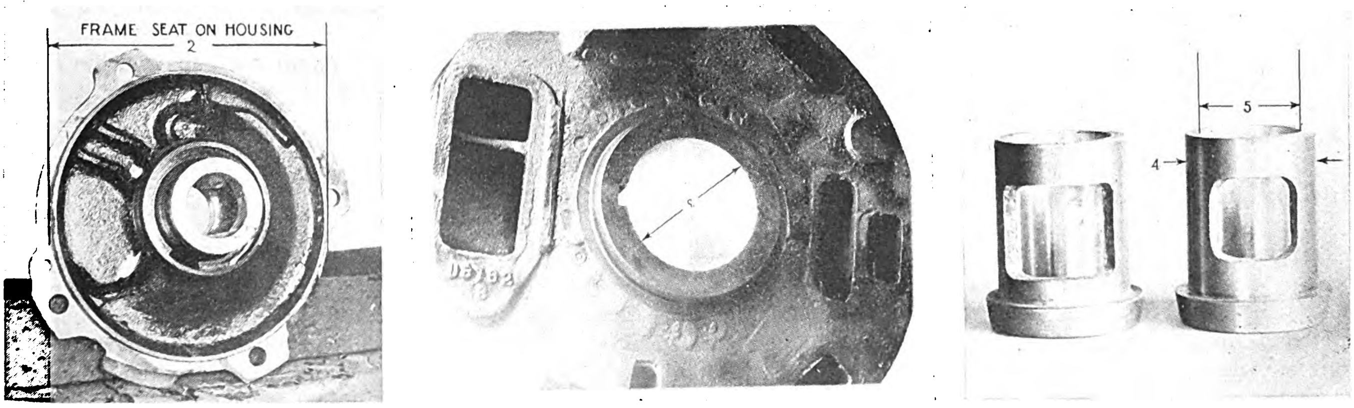


Housing fit in split frame railway motor

If a new bearing with standard outside diameter can be forced into a housing with a pressure less than 1 ton, the housing should be rebored to a diameter larger than standard and the keyway cut deeper. Housings with weak bearing seats should be scrapped if a safe press fit of approximately 5 to 8 tons is not needed to hold the bearing in place and new housings substituted.

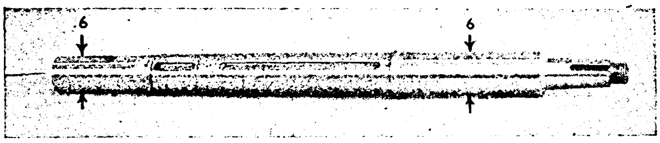
In boring the housing for the bearing seat no allowance should be made. The standard or oversize bore should be machined to a diameter within the limits of ± 0.001 in. of the nominal dimension. The variations for the keyway in the bearing seat in the housings are — 0.000 in. to + $\frac{1}{64}$ in. above the nominal dimension for depth and — 0.000 in. to + 0.003 in. above the nominal dimension for width.

In order to obtain a good press fit of the bronze bearing in the housing with a pressure of approximately 3 to 5 tons, it is essential that the bearing be not removed from its seat unless it must be repaired or the armature end play adjusted. A bearing should not be returned to service if the pressure required to press it into the housing is less than 1 ton. Bearings with standard outside diameter which cannot be held in place in a new or repaired housing with at least 1 ton pressure should be scrapped and new bearings used instead. Bearings with oversize outside diameter should be machined to standard size if when forced into a rebored housing less than 1 ton pressure is needed. The new armature bearing should be finished on the outside to the nominal standard or oversize dimensions plus an

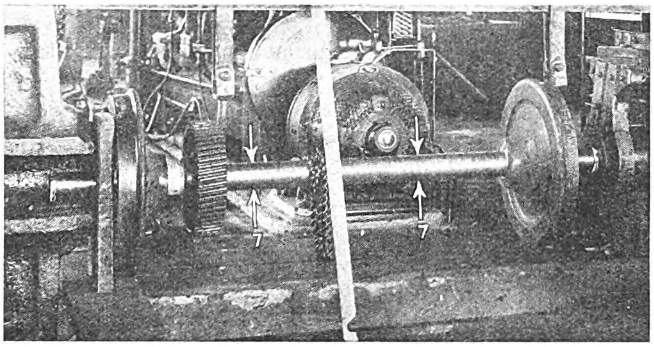


At left, frame seat on a housing. In center, armature bearing seat in housing. At right, armature bearing outside fit and bore. Bearing at right is an improved design of that shown at left in which the size and shape of the oil opening is changed to increase the press fit allowance for press fit of + 0.003 in. to + 0.005 in. The width of the keyway in the bearing should be machined to nominal dimension within the limits of + 0.000 in. to — 0.002 in. in order to have a tight fit with the key. The variation for the depth of the keyway is — 0.000 in. to + $\frac{1}{64}$ in. The length of the keyway in armature bearings should be within the limits of — 0.000 in. and + $\frac{1}{16}$ in.

Considering the variation on the finished bore of the housing and the allowance and variation on the finished outside diameter of the bearing, the minimum allowance above the metal-to-metal fit will be + 0.001 in. and the maximum will be + 0.005 in. This allowance will result in a press fit, as previously mentioned, of 3 to 5 tons, depending on the design of the bearing, thickness of bearing shell and size of oil opening. Bearings placed in split frame motors without housings are clamped in their seats by means of the bolts holding the frame halves together.



Shaft with armature bearing seats indicated



Axle with motor axle bearing seats indicated

As long as the bearing can be held in place with at least 1 ton pressure all the wear in the bore and on the face of the flange can be repaired by rebabbitting. The babbitt lining can be made thicker and bored to fit the standard or undersize shaft, providing the thickness of babbitt is less than the single air gap between armature and pole piece. An important advantage is incorporated in a bronze bearing shell when the thickness of the babbitt lining is smaller than the single air gap of the motor. In such bearings the shaft will run freely on the bronze shell if the babbitt melts and the armature core will not go down far enough to touch the pole pieces. This will enable the motorman to bring the car to the carhouse without holding up the traffic. If the babbitt melts when the lining is equal to or larger than the single air gap, the armature banding wire, the armature insulation, coils or even fans and other parts may be destroyed and the wheels locked.

The babbitt lining should be $\frac{1}{16}$ in. thick in new bearings with standard bore, as well as in bearings with undersize bores for use with worn shafts machined smaller than standard, as $\frac{1}{16}$ in. is the recommended limit of wear in a bearing bore if worn on one side. Operators with a few motors of one type may use new bearings with linings $\frac{1}{8}$ in. thick if it is desirable to rebore the bearings for each individual worn shaft.

Excessive wear on the flange end can be compensated for by taking the bearing out of the housing and placing steel rings, each $\frac{1}{16}$ in. thick, behind the flange so as to bring the total armature end play within allowable limits, which should be not less than $\frac{1}{32}$ in. Babbitted bronze bearings should be bored with the following allowances and variations:

Nominal Bore	Allowances and Variations Before Pressing the Bearing Into the Housing
2 in. to 3 in. inclusive	+0.006 in. to +0.008 in.
Over 3 in. to 4 in. inclusive	+0.008 in. to +0.010 in.
Over 4 in. to 5 in. inclusive	+0.012 in. to +0.014 in.

Bearings should be finished on the thickness of the flange within the limits of plus or minus 0.005 in.

The repair on the bearing seat of the armature shaft goes hand in hand with the set-up made for the machining of the bearing bore. Operators with many motors have standardized on shaft sizes in steps of $\frac{1}{32}$ in. or $\frac{1}{16}$ in. diameter less than the original. They carry bearings in stock having finished bores in the same gradations. In such cases the shaft should be machined to the next smaller standard undersize diameter if it is worn $\frac{1}{64}$ in. maximum on the diameter. This subject was discussed in an article, "The Use of Undersize and Oversize Armature and Axle Bearings," published in ELECTRIC RAILWAY JOURNAL, issue of April 18, 1925.

In modern commutating pole motors the bearing seat of the armature shaft should not be weakened more than $\frac{1}{8}$ in. on the diameter. Even this margin has to be decreased for special light-weight motors or for shafts not made from the necessary high-grade material. Bending or breakage of the shaft causes trouble which is more expensive to repair than to supply a new shaft. Worn shafts machined down to the safe limit may still be used with a steel sleeve shrunk over the full length of its bearing seat. This steel sleeving can be machined to the standard diameter if it still possesses enough mechanical strength to be held tightly in place.

Operators with only a few motors of the same type should preferably true up the tapered worn shaft and bore the respective bearings to suit the new diameter. A steel sleeve could be shrunk on the shaft and the same procedure followed as that recommended when the shaft is worn to the safe limits. If it is worn beyond the safe limit the shaft should be replaced.

All standard and standardized undersize shafts should be machined to the nominal diameter, being finished at the bearing seat within the limits of + 0.000 to — 0.002 in. Using these limits, together with the allowances and variations on the bearing bores, the following minimum and maximum total clearance between the shaft and bearing bore will result for repaired motors, assuming that the bearing does not collapse when pressed into the housing.

Nominal Shaft Size	Clearance Minimum Maximum
2 in. to 3 in. inclusive	0.006 in. to 0.010 in.
Over 3 in. to 4 in. inclusive	0.008 in. to 0.012 in.
Over 4 in. to 5 in. inclusive	0.012 in. to 0.016 in.

These clearances are also suitable for bearings bored to suit the worn shaft. The clearances are necessary to prevent collapse of the bearing when pressed into the housing and to compensate for some of the misalignment in the assembled motor. The housing fit in the frame and the bearing fit in the housing should be checked with care to insure that these parts are seated properly if the bearing pinches the shaft. The shaft dimensions should also be checked and it should not be allowed to be bent over a reasonable amount. Finally the clearance between bearing bore and armature shaft should be such that it turns freely in the bearing and establishes the necessary oil film.

Most axles must be replaced before they reach the point where the motor bearing seat would have to be machined as far down as $\frac{1}{4}$ in. smaller than standard, which is an average safe limit. Each individual case should be considered carefully as much depends on this particular part of the car equipment. Human lives are directly endangered and considerable damage may be involved if an axle should break on a car moving even at low speed.

The axle should be machined at the motor bearing seat to the next smaller standard undersize if the diameter is worn $\frac{1}{32}$ in. maximum. This holds good only when it has been decided to carry in stock undersized axle bearings with bores in steps of $\frac{1}{16}$ in. Otherwise the axle may have its tapered worn bearing seat trued up if other repairs make it possible to do this machining at reasonable expense.

The standard or standard undersize axle should have the motor bearing seat machined to the nominal diameter, being finished within the limits of + 0.002 in. and — 0.002 in.

The wear on the axle bearing bore or on the flange end can be repaired by babbitting the bronze bearing. Excessive motor end play on the axle should be compensated for by the adjustable axle collar. The width of the flange may be increased or material may be added to the wheel hub by welding or other means to bring the end play of the larger motors within the allowable limits. The motor end play should be not less than $\frac{1}{32}$ in.

The standard bores and standard undersize bores of solid bronze or bronze babbitt lined axle bearings should be finished to the following allowance and variations:

Nominal Bore	Allowance and Variations
Bore up to and including 5 in.	+0.015 in. to +0.017 in.
Over 5 in.	+0.028 in. to +0.030 in.

The width of the bearing flange is to be finished within the limit of ± 0.005 in.

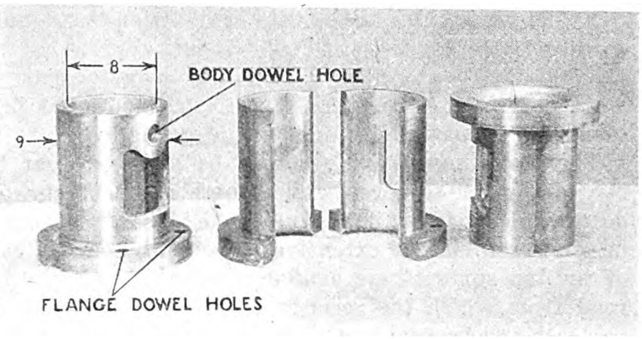
Considering these allowances and variations and the limits for finishing the axle on the motor bearing seat the following clearances between axle and bearing bore may be obtained:

Nominal Bore	Clearance
Bores up to and including 5 in.	0.013 in. to 0.019 in.
Over 5 in.	0.026 in. to 0.032 in.

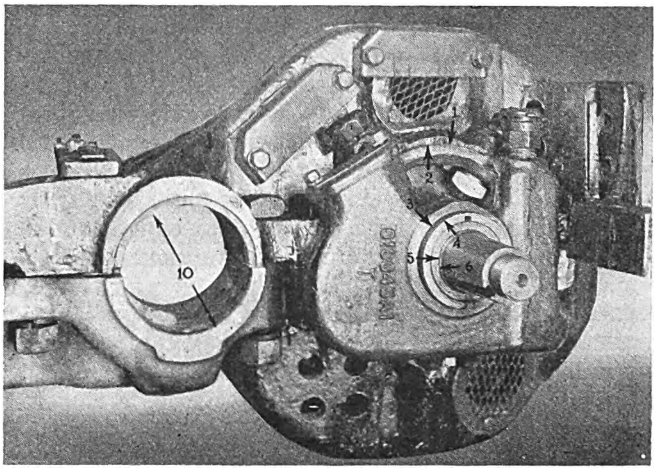
Clearances larger than those specified above should not be allowed. The clearances given cause the bearings to be clamped tightly by the axle caps of new motors, will not pinch the axle and will permit a sufficient oil film to build up around the axle in the motor bearings.

An axle bearing with standard outside diameter should be scrapped if worn on the outside to such an extent that it cannot be clamped tightly onto a new or repaired axle bearing seat. Repairs on the outside of axle bearings do not warrant the expense. An axle bearing with oversize outside diameter may be machined to standard and used on other motors if it cannot be clamped in the rebored bearing seat. Worn dowel holes or keyway of bearings should be welded up and redrilled or remachined. The allowance for clamp fit on the outside is — 0.000 in. to + 0.003 in. above the nominal diameter. Welded dowel holes in the flange should be drilled $\frac{1}{64}$ in. larger, the body dowel on the flange end $\frac{1}{16}$ in. and the body dowel on the end opposite the flange $\frac{1}{32}$ in. larger than the respective dowel pins protruding into them. The limits for the keyway in the axle bearings are the same as for armature bearings except that the width of the keyway is to be machined within the limits of + 0.002 in. to + 0.005 in.

A worn axle bearing seat in the frame and axle cap should be welded. With sufficient material added, the bearing seat can be rebored to standard dimension the same as on the new motor. The original good clamp fit of an axle bearing can also be restored if sufficient material will surround the bearing by increasing the diameter of the bearing seat in the frame and axle cap $\frac{1}{8}$ in., using a $\frac{1}{8}$-in. oversize bearing. The worn bolt holes, dowel seats or keyways in the axle cap have to be welded up and drilled or cut new.



Outside and bore of axle bearings



Complete motor with wearing surfaces affecting the gear center indicated. Oil sealed housing is used on this motor to improve lubrication

When boring the frame and axle cap a single liner 0.017 in. thick is to be inserted in the split. Then the bearing seat should be machined to the nominal diameter within the limits of ± 0.002 in. Limits for the keyway in the axle caps are the same as those for the keyway on armature bearings. The key should fit tight in the axle cap.

With the liners removed from the split after reboring, the minimum gap provided for the necessary clamp fit with the axle cap bolts will be 0.015 in. and the maximum will be 0.019 in., considering the variations on the bore for bearing seat as well as the allowance on the outside diameter of the bearing. The above gap will leave sufficient space for correct adjustment of the clamp fit on new motors. Shims may be used to release the clamping action until the bearing is properly seated. With the different motor parts repaired and machined they will fit together the same as on new motors if the surfaces are machined smooth and gaged accurately.

In the foregoing discussion the repairs on the motor to provide correct gear-center distance have been considered. The subject has been treated as if the ten surfaces had reached simultaneously the limits described in the article in ELECTRIC RAILWAY JOURNAL, issue of May 21, or as if it had been necessary to repair all parts of a motor simultaneously.

It would be ideal if the repairs of all motor parts could be made after a set time, say 100,000 car-miles. However, as this very seldom happens, operators will ask the question: "How much may a motor part be worn before repair is necessary if the motor has been taken out of service for one reason or another?"

The motor may have reached the limit of wear for one of the ten surfaces while others are not yet worn down to the condemning limits. The above question can be answered only if extensive records of wear on each of the ten surfaces are available and then only for the road from which the records are taken. Generally all parts should be repaired which will reach the set limit of wear before the motor is again due for general overhauling.

It is, therefore, recommended that the necessary set-up be made for a record for the amount of wear of the different surfaces in one overhauling period. This period should be established after giving consideration to the wear on all details of the car equipment. Records should be kept of the wear of motor parts, control equipment, braking equipment, trucks, wheels and car body. For all of these parts, limits or a definite life should be set first. The general overhauling should be made so that it meets with the time at which the most parts demand repair or scrapping.

Parts which need repair previous to the set time should be improved in quality so they can wait until the car is overhauled. Parts which have a longer life should either be improved or reduced in quality until they last a multiple of the overhauling period. Considering the ten surfaces to wear on the motor the operator can assist the manufacturer to improve motors in service and to design new motors. All motor parts would have to be considered, such as the commutator wear, brush-holder wear, fatigue of armature leads, the wear on field coils, gear, pinion, gear case and other parts subjected to wear.

The wear on the different motor parts in a given time will depend to a large extent on the kind of attention the motor will receive. The wear in the bearing, for example, will be less with better lubrication and with better oil. The wear will depend also on the sand condition of the road and the protection given the bearings against admission of sand, water or other foreign substances. The commutator, brush-holder and carbon wear depend also on the protection against sand. All these factors are different for various roads and motor designs. The amount of wear can, therefore, be obtained only by experience.

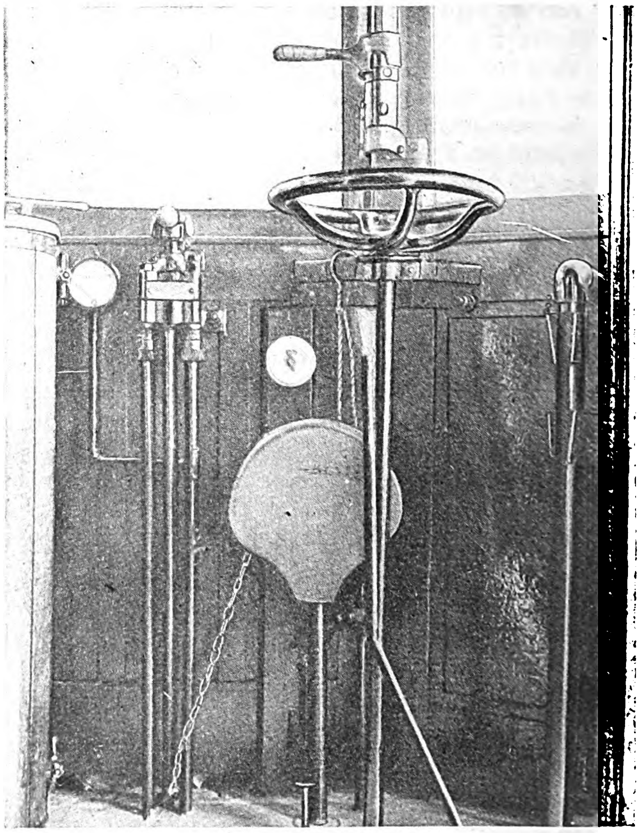
Protection adapted to special conditions can make the life of the motor parts fairly uniform for the different roads. Dust cap brush-holders, for example, will lessen wear on carbons, brush-holders and commutators, especially on sandy roads. New type dual ventilation likewise reduces this wear. Deep oil well covers and oil sealed housing will prevent admission of foreign substances into the bearings.

Records will show the weak parts and perhaps suggest a remedy. As soon as some sources of failure are eliminated more attention can be paid to the remainder. The number of failures will reach the minimum. All parts will then wear so that they require repair at the same time. The whole car and its equipment can be stripped down, cleaned and repaired at one time, thus reducing considerably the cost of maintenance. All parts will be brought up to previous standard and the equipment of today will be the same as at the time when it was new.

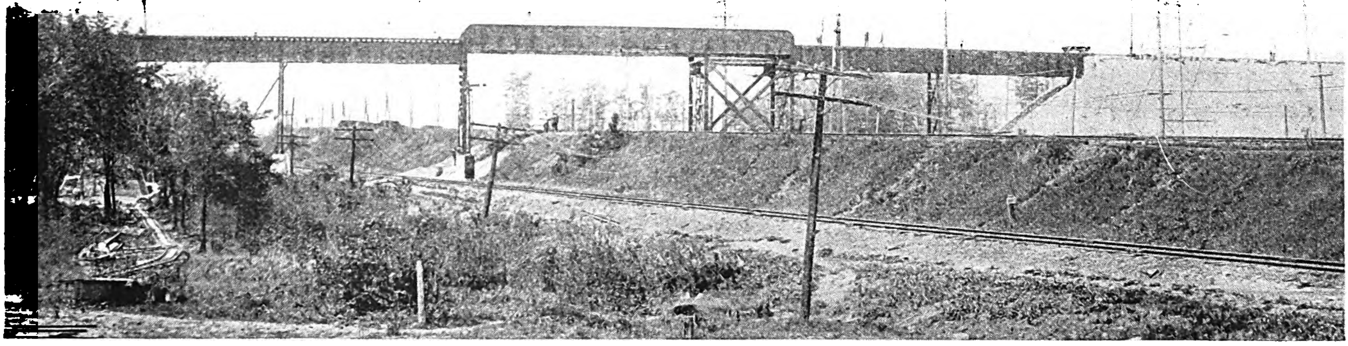
This program requires a careful study of all parts for two years or longer. Such a combined effort by all operators will bring the electric railways ahead of the steam roads and the nation ahead economically.

Motorman's Stool Chained to Platform

ON A NUMBER of double-end cars of the Connecticut Company two motormen's stools are provided, one at each end. These are fastened by chains to the floor, in such a manner that when not in use they can be set in a receptacle out of the way. This arrangement permits free movement of the stool to any desired position on the platform but prevents its removal from the car. Replacement of stools has been eliminated by this device and every motorman is sure of finding one on any car to which he may be assigned.



On this car of the Connecticut Company a stool is provided at each end for the motorman and fastened by a chain to the platform floor



An embankment 40 ft. high was required to get sufficient clearance under the steel bridge that carries the new cut-off from West Junction over the Chicago & Northwestern Railway tracks

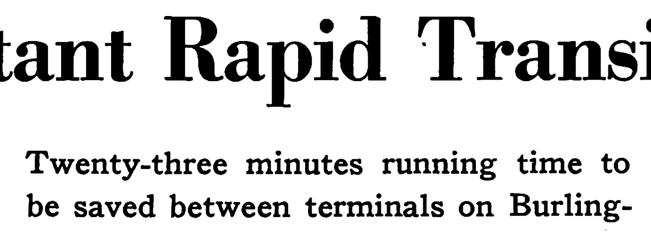
Milwaukee Completes Important Rapid Transit Link

Twenty-three minutes running time to be saved between terminals on Burlington-East Troy line by the new cut-off

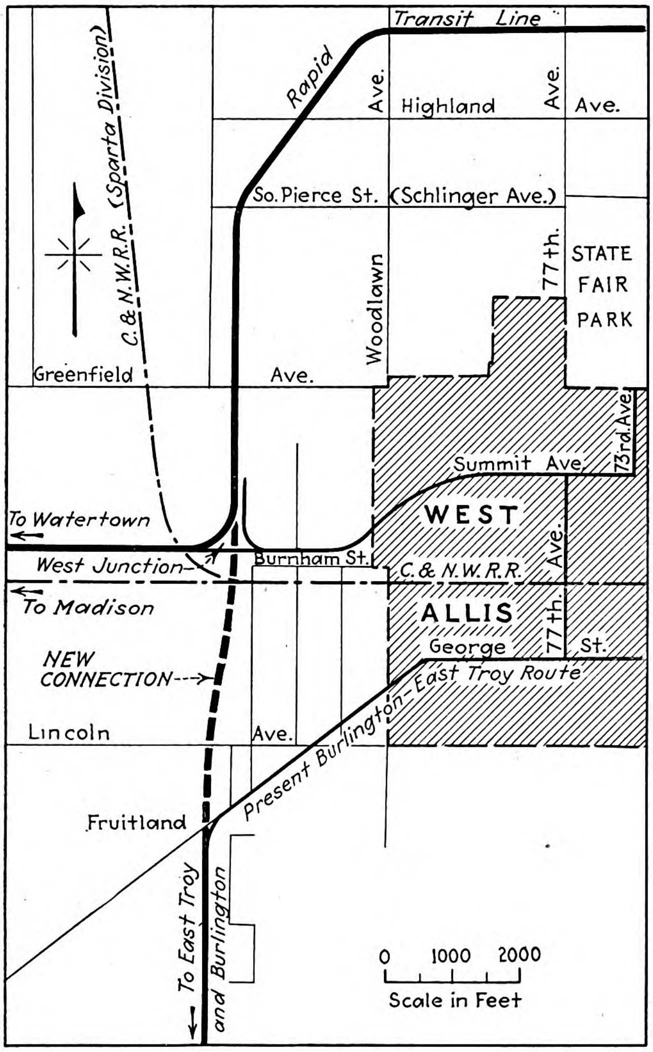
COMPLETION of a new cut-off 6,500 ft. long between West Junction on the Waukesha-Oconomowoc-Watertown line and the intersection of 93d and National Avenues on the Burlington-East Troy line of the Milwaukee Electric Railway & Light Company is the final step in the construction of a system of rapid transit entrances to the city for that company's interurban lines from the west and southwest.

Trains on the Watertown line have been operating for a year over the rapid transit private right-of-way that extends from West Junction to 36th Street on a solid embankment fill entirely free of grade crossings except between Hawley Road and 68th Street, where a right-of-way had been acquired and grade separation work will be under way this summer. Completion of the new link from West Junction to the East Troy-Burlington line will permit high-speed trains on these two divisions to be brought into the downtown terminal over the same route as those from Watertown. This will eliminate running along the congested National Avenue highway and busy West Milwaukee and West Allis Streets and effects a saving of 23 minutes running time from the former schedule.

Although only a mile long, the new link includes a wide range of construction work. Starting south from West Junction it ascends on a 3 per cent grade on a heavy fill which reaches a height of 40 ft. At this point it crosses the Wells-West Allis line of T. M. E. R. & L. Co. and the Sparta division and Madison division of the Chicago & Northwestern Railway on a steel viaduct 283 ft. long. A clearance height over the railroad of 22½ ft. is maintained. Here the track is carried over a piece of swampy land on a timber trestle 418 ft. long. The grade descends at 2.633 per cent and enters a cut approximately 1,100 ft. from the south end of the viaduct. This cut then extends for 1,900 ft., the track



One of the five new automatic substations on the Burlington-East Troy line. St. Martins, which is illustrated, is a two-unit station


Rapid Transit Line
Highland Ave.
Ave.
Ave.
So. Pierce St. (Schlinger Ave.)
C.&N.W.R.R. (Sparta Division)
77th.
STATE FAIR PARK
Woodlawn
Greenfield Ave.
73rd Ave.
Summit Ave.
WEST ALLIS
To Watertown
Burnham St.
West Junction
C.& N.W.R.R.
77th Ave.
To Madison
George St.
NEW CONNECTION
Present Burlington-East Troy Route
Lincoln Ave.
Fruitland
To East Troy and Burlington
0 1000 2000
Scale in Feet

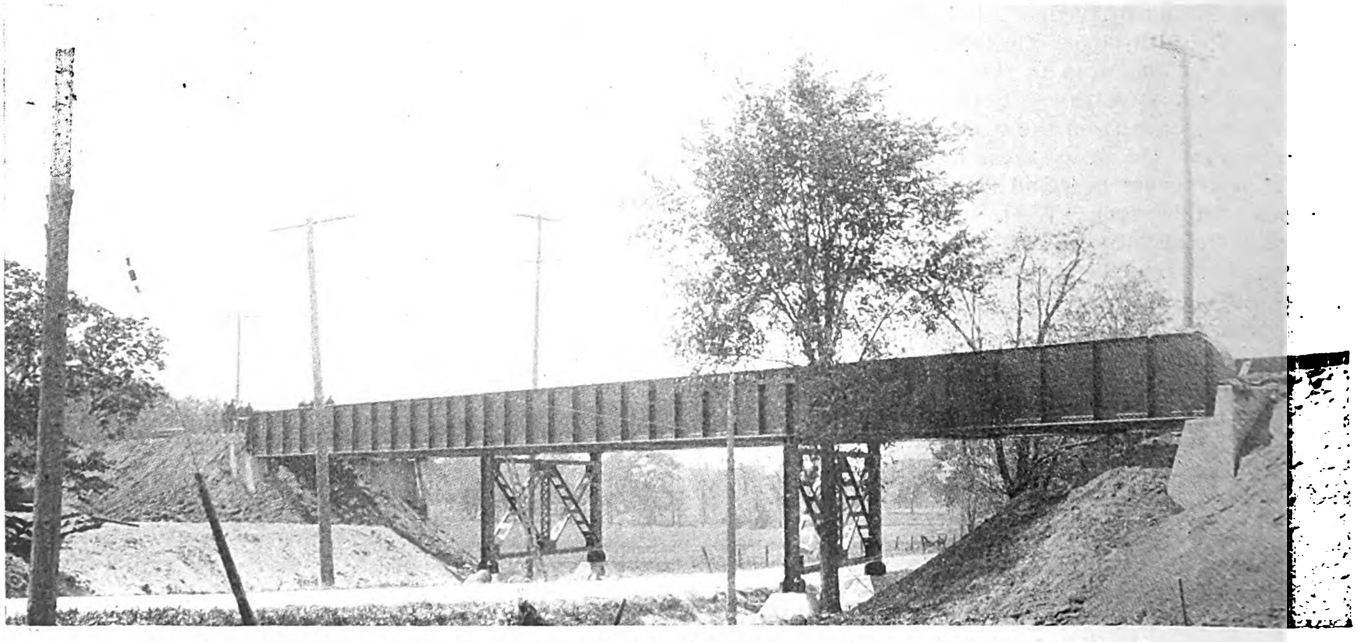
The new connection is a strategic link between the rapid transit entrance to the city and the East Troy-Burlington interurban line. A saving of 23 minutes in running time is thus made possible

passing under a steel highway bridge at Lincoln Avenue, then emerges on a fill and rises on a 1.55 per cent grade to another steel bridge over National Avenue and drops down on a 1.552 per cent grade to join the present Burlington-East Troy line tracks at grade. A total of 135,000 yd. of earth was moved in the grading and approximately 400 tons of steel went into the bridges. The bridges and cuts are wide enough for double track, although the cut-off will be operated single track until additional construction is justified. Eighty pound A.S.C.E. rail on Sellers tie plates is carried on 8-ft. cedar ties and ballasted with crushed rock from the company's quarry on the Milwaukee Northern line. Construction was started on March 3 of this year and the new cut-off is expected to be open for regular service on June 20. The line is to be fully protected by a Nachod signal system.

Trolley voltage on the Burlington-East Troy line is being changed from 1,200 to 600 volts, in line with the company's standard on the remainder of its interurban system. Five automatic substations are being installed at Mukwonago, Chamberlain, St. Martins, Wind Lake and Waterford. St. Martins is a two-unit station, the others being single. A new 26,400-volt transmission line was erected between St. Martins and Mukwonago, a distance of 15 miles. The substation buildings are of simple but neat appearance as shown in an accompanying illustration.

Chicago Rapid Transit Insures 5,683 Employees

EMPLOYEES of the Chicago Rapid Transit Company, Chicago, Ill., are insured to the extent of $10,595,000 with a maximum protection of $20,445,000 under a group plan put into effect in December, 1926. Each of the 5,683 employees is furnished with double accidental death insurance in the sum of $1,000, while health and accident insurance providing compensation as high as $20 a week for 26 weeks has been provided for any one disability in any one year.



A steel bridge over the highway at Fruitland is at the southern end of the new cut-off

You Can't Sell Cotton Goods in a Silk Age[*]

By Charles Gordon

Editor *Electric Railway Journal*

NOW, of course, you are not in the business of selling cotton goods. You are supposed to be in the business of selling transportation. And so, this subject would have been more specific if it had said, "you can't sell uncomfortable seats in clumsy, unattractive, lumbering cars in this age of air-cushioned upholstery, stream lines and pneumatic tires."

But I like the expression, "You can't sell cotton goods in a silk age." It isn't original with me. It was used by a prominent railway executive who is given to doing unusual things and using unusual expressions. This phrase is used merely as a figure of speech, but it puts into a few words a colorful summary of what I consider the best thinking on the present electric railway situation.

The industry is talking a great deal today about merchandising transportation. That is a nice sounding phrase. We are all using it. But our industry has a tendency to use such expressions as this without thoroughly realizing their significance. I doubt if there are many railway men who do not feel that they are taking every reasonable step to merchandise their service. And yet, I venture to suggest that most of the industry isn't even scratching the surface of the possibilities in this direction.

Stop trying to screw your service down to the limitations of a split penny fare. Give your riders a taste of really modern transportation and all the politicians in town can't keep you from getting the proper fare to support it.

Take this merchandising idea and hang onto it for a moment. Stop using the words merely as a trite, smooth-sounding phrase. Let's dig into this thing a little bit and see where it leads and what it demands.

Are Trained as Operators

If we are trying to sell cotton goods in a silk age we are poor merchants. The first principle of merchandising success is to provide a product that the customer will buy. If electric railway men have erred here it is not surprising. They were not raised as merchants. Their training is that of operators. In the past we have been manufacturers of the product known as public transportation. Our experience was obtained in days when the customer had no choice but to use our service. And so our entire attention was devoted to providing that service as economically and as efficiently as possible.

As transportation operators, electric railway men don't need to take off their hats to anybody. They have provided local transportation under conditions that almost defy arithmetic and make two and two equal five.

When the cost of labor and material was doubling, when the prices of all products that the industry buys were advancing by leaps and bounds, when every element that goes into the cost of local transportation acted as though it was hitched to the end of a skyrocket, the rate of fare remained practically constant for years and then slowly rose to a figure which is now only a ridiculously small amount above that before the war.

This was, however, by no means the limit of the electric railway man's accomplishments as an operator. The industry's credit went to pieces. Still he had to carry on—and he did carry on in a manner to his everlasting glory. Without money for improvements, with an unfriendly public, and with his own employees inclined to kick him when he was down, with his back against the wall, the electric railway operator managed to carry on.

I am impatient with a recital of the industry's burdens and troubles. I give you this brief review of the conditions encountered by most of the properties in this country merely to illustrate some of the operating difficulties that have been successfully overcome. I haven't given you a list of all the difficulties. It took strong hearts to carry on. The situation looked, many times, to be impossible of solution. The industry seemed doomed. It isn't surprising that some weakened and doubted. During the very period when all these troubles were piling up, the greatest single menace of all to the public transportation industry was gaining momentum by leaps and bounds. The automobile entered the picture. The country took to rubber tires. Then the sages began freely predicting that the end of the local transportation industry had come. First in the hands of its owners, then as a jitney, and finally in the form of a bus, the automotive unit on rubber tires threatened for a time to take away the patronage—and did take a lot of it—from the income-restricted, expense-ridden local transportation companies.

But they carried on. They had an obligation to their communities and one to their investors. They continued in the face of overwhelming odds to operate as best they could. They trimmed expenses, and then trimmed again. Even when L. F. Loree, president of the Delaware & Hudson Railroad, was saying that the country could wipe off its books the $6,000,000,000 invested in the electric railway industry, that industry was already turning the corner toward improvement!

Oh, yes! As transportation operators electric railway men are entitled to the admiration of the business world. They have continued to produce a ride for little increase in price when every element entering into the cost of that ride has increased enormously.

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[*] Address delivered before annual meeting of the Mid-West Electric Railway Association, St. Louis, June 9-11.

I didn't start out here to pat electric railway men on the back and tell them how good they are. Some of them know me better than that and know that I am prone to criticise. But I hope that my criticism is friendly criticism—that is what I always intend it to be. Friendly criticism, constructive criticism, is good for any of us. I'll try not to disappoint you in that direction before I finish. But I want to get this picture of the industry balanced. I want to add another word or two on the credit side of the ledger.

Even while you were staggering under discouraging burdens—and some of you are still doing so—the measures that were introduced for economy and the improvement of service were blocked nearly every step of the way by short-sighted politicians and selfish labor. When the transportation ship was in imminent danger of foundering under the unbalanced relation between income and expense, the one-man car was conceived. This was merely a step in the direction which has brought America the industrial supremacy of the world. Mechanical safety devices were introduced to do the work formerly done by human mind and muscle. Machine labor was substituted for hand labor and the resulting economies made it possible to furnish more service at less cost than formerly.

You can't merchandise an inferior product — if you expect to stay in business in one town very long. Your product consists of your cars and the manner in which they are operated. After all, that's all you have to sell.

But in many places the improvement was bitterly opposed. Men thought their jobs were in jeopardy. Despite the fact that it was repeatedly demonstrated that the natural turnover of labor takes care of the reduced manpower required as one-man cars are introduced, they were doggedly opposed and are still being opposed in some places. I know of no city in which the introduction of one-man cars threw men out of work. But I know many cities where it brought them increased pay. I know also that it helped to save many an electric railway job, for without the one-man car many properties that are now rendering efficient service to their communities would have found it impossible to survive.

And so I repeat that as transportation operators you have justifiable cause for pride. In the face of all these difficulties and obstacles you have in large measure—most of you—lived up to high ideals of public service and have provided transportation to the millions with a full sense of your responsibilities.

MEETS A NEW CHALLENGE

Here the industry meets a new challenge. This public of which we speak so much has changed. Its habits have changed. Its demands have changed. Particularly is this true as regards transportation. Speed, convenience, comfort, luxury! That is what today's public wants, and there are 20,000,000 automobiles in the country to prove it!

"The automobile is expensive," you say. Yes, that is true, but there have been 20,000,000 of them sold in this country and nobody has found the saturation point yet. What is the significance of this? Doesn't it give the key to your merchandising situation? Doesn't it mean that the first principle of selling to the American public—or to any public, for that matter—is to make the product fit the demand? Price is a consideration, but it is a secondary, rather than a primary, one. Of course, there have been more Fords sold than there have been Packards. I'll venture the guess, however, that there are many more low-priced car owners straining their resources and sacrificing other comforts and even necessities to operate their machines than there are larger car owners in that situation. Consequently the small cars are a luxury for a large part of those who buy them. I could continue to go on in this strain. I could point to the percentage of automobiles that are sold "on time" as an indication of the financial strain which people are willing to endure in order to have speed and luxury in travel.

Please do not misunderstand me. I am not deprecating the automobile a particle. I don't think the country is going to the everlasting bow-wows because people have taken to spending their incomes on rubber and gasoline instead of other things that might have been worse. If you are tempted in that direction please remember that the savings bank deposits in this country have been built up to an astounding level. Right here it may also be worth adding that there seems to be a significant relation between this fact and the fact that the savings banks have taken to merchandising their own service intensively.

The automobile has contributed much to this country, and I am not one of those who have any idea that it should be legislated out of business or taxed to death because it carries passengers who formerly rode on street cars. In fact, the automobile has enormously increased the riding habit of the people of this country. I am inclined to believe that once we learn how to bring our service up to the level of the popular demand and at the same time learn how to merchandise it intensively, the automobile, through this increased riding habit which it has produced and through the fact that it has brought us up on our toes because of the very necessity of self-preservation, will have proved a blessing in disguise to our industry.

Rapid increase in the number of automobiles in cities will lead to great curtailment of the individual's unrestricted right to use the streets. When the number of individuals who want to use the streets becomes such that they automatically interfere with each other's rights and cut down the usefulness of the existing street facilities, then the rights of the individual must give way to the needs of the community. The right to use the streets for pleasure must give way to the uses of business and necessity. I don't believe the street car has any greater right to the use of the streets than have I in my automobile, except that it serves the needs of 75 per cent of the people, while I serve only my own convenience. As the agency for transporting 75 per cent of the people who use the streets, the public vehicle, in the name of its riders, is certainly entitled to a proportionate consideration in the regulation of street traffic. Only in the interests of its riders does it claim and is it entitled to special consideration.

Public officials are prone to be confused between the number of vehicles and the number of riders using the streets. Since the car rider is largely inarticulate and unorganized the responsibility for protecting his interests rests on the railway management. Courageous discharge of that responsibility is a public service of the highest order.

Now let's get back to merchandising. Those 20,000,000 automobiles that I mentioned a moment ago illustrate what can be done in merchandising a product which fits the public demand, even when the price of the product is a severe strain on the family purse. As transportation men, we know all about operation—that is to say, we know all about manufacturing the product—furnishing the service. But for the first time in the local transportation industry a new element has come into the situation—the need for selling the service that we formerly provided free of competition. For the first time in their experience transportation men are faced with the problems of merchandising and here their experience is very limited.

The problem is complicated by the fact that transportation men must not only take to selling their service for the first time, but the character of the demand in transportation has changed. This is indeed a silk stocking age. If there are any doubts in your mind ask the cotton mill owners of New England—or use your eyes on the street. When the shop girl will spend $2 for a pair of silk hose out of her limited income, surely price is a secondary consideration if you can make the public want a product badly enough. The industry has been concentrating on economy. It has been splitting pennies. It is only beginning to take in hand seriously the study of the quality of its product.

Of course you have been expecting me to get around to the subject of modern cars and I am not going to disappoint you. But I want to talk cars from just a slightly different angle for a moment. Permit me to repeat something that I have said several times before. Improved cars are not a panacea. They are not a substitute for good management. They do not eliminate the need for concentrated, intelligent, persistent, merchandising effort. But they are a part of good management, and they make it possible for merchandising effort to be effective. You can't merchandise an inferior product—if you expect to stay in business in one town very long. Your product consists of your cars and the manner in which they are operated. After all, that's all you have to sell.

I have been accused of advocating the "dolling up" of cars beyond the limits of practicability. I don't think it is necessary to have a lot of "gimcracks" on cars. I think many of the circus stunts are mere passing phases. They are good because they attract the attention of the public. Anything which will interest the public in the street railway situation—favorably, of course—is justified. Car improvement will ultimately settle down to perfection of design in the direction of appearance, performance and appointments, while at the same time remaining within the limits of reasonable maintenance and operating cost. There is, however, still a wide open field ahead.

MAKING RAPID PROGRESS

As we survey the electric railway situation today it is evident that the industry is moving forward very much more rapidly than some who are close to its daily routine may perhaps realize. When we consider the progress which has been made in any one of half a dozen cities that readily come to mind we are brought face to face with the complete reversal of outlook which has taken place in a very short period of time. Unless the developments are viewed in perspective the rapid change is not easily apparent. In a sense, it is like watching one's own offspring grow up. We are so close to them that they have blossomed into manhood or womanhood before we realize it.

There is no question but that the electric railway industry has definitely turned the corner and is moving forward rapidly to complete recovery and expanded usefulness. I am afraid, however, that there is still in the minds of some managements a lack of confidence in their own industry. I heard a speaker at a recent meeting, in endeavoring to illustrate the need for confidence and enthusiasm in winning success, say, "The bigger the IF on the clubhouse door, the lower the score." Spirit and confidence are as important in business as they are in sport. A little more push, a little more spirit, a little more optimism, a little more of an open mind regarding the possibilities of applying ideas developed by the other fellow, a little more enthusiasm and confidence in the possibilities of our own business are all that is needed.

President Sawyer aptly said recently: "This is a new day. The methods of the past will not suffice to meet these present-day conditions. Every precedent and practice that we have built up over these many years is subject to question." Every progressive railway man must agree with him heartily. I only add, "this is a silk age." Get the cotton goods off your shelf; make it your business to determine the kind of a product your customer wants and then sell it. Stop trying to screw your service down to the limitations of a split penny fare. Give your riders a taste of really modern transportation and then all the politicians in town can't keep you from getting the proper fare to support it.

Here the industry meets a new challenge. This public of which we speak so much has changed. Its habits have changed. Its demands have changed. Particularly is this true as regards transportation. Speed, convenience, comfort, luxury! That is what today's public wants, and there are 20,000,000 automobiles in the country to prove it!

A. TAURMAN

Wins Monthly Prize for May

Application of Alemite lubricating fittings to Brill half-ball brake hangers is awarded first $25 monthly prize in "Electric Railway Journal" Maintenance Contest. J. E. Blaiklock receives honorable mention

A. TAURMAN

AT A MEETING of the judges in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition, held at the American Electric Railway Association headquarters, New York City, on June 8, it was decided to award the $25 monthly prize for May to the article describing the use of Alemite grease fittings to half-ball brake hangers. This article was submitted by A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company, Birmingham, Ala.

All of the seven articles which were published in the Maintenance Data Sheet section of the May 21 issue were given careful consideration by the judges, and in addition to awarding the $25 cash prize, it was decided that the article describing a "Parawax Method for Determining Flange Wear of Wheels" should receive honorable mention for its usefulness. This article was submitted by J. E. Blaiklock, master mechanic Washington Railway & Electric Company, Washington, D. C. The use of this method takes the determination of flange wear out of the guessing class and places it upon a permanent record basis.

The practice of lubricating half-ball brake hangers through the use of Alemite fittings, as described in the May 21 issue, is an application of a method used quite universally on automotive equipment. In the original design of brake hangers excessive wear results from the difficulty of keeping them lubricated. Reduction of wear in this type of brake hanger is very important since looseness results in misalignment and reduced efficiency of the braking system. The use of the Alemite fittings by the Birmingham Electric Company has doubled the length of life of the hangers. The ease with which lubrication can be carried out after the fittings are applied insures that they are lubricated regularly. The method has resulted in a considerable decrease in the noise from trucks equipped with this type of brake hanger, and this subject is one which is receiving particular consideration by all electric railways at present.

Mr. Taurman became superintendent of equipment for the Birmingham Railway & Light Company in October, 1919. His railway experience began in the mechanical department of the Southern Railway at the Richmond shop, Richmond, Va., in 1901, where he served as machinist apprentice, shop foreman and mechanical draftsman. On leaving the Southern Railway he was connected with the American Locomotive Company as assistant resident inspector of locomotives at the Richmond Works.

In 1907 Mr. Taurman severed his connections with the American Locomotive Works to accept the position of mechanical draftsman with the New York Air Brake Company at Watertown, N. Y. In February, 1908, he returned to Richmond and entered the service of the Virginia Railway & Power Company, serving as a machinist, carhouse foreman and master mechanic. In 1913 he was promoted to superintendent of equipment in charge of all rolling stock and shops of the Virginia Railway & Power Company in Richmond, Norfolk and Petersburg.

Mr. Taurman is secretary of the Association of Equipment Men, Southern Properties, is a member of the American Society of Mechanical Engineers and has served on the equipment committee of the American Electric Railway Engineering Association. As an electric railway man Mr. Taurman has given considerable attention to mechanical improvements, not only in rolling stock but also in various track and way construction.

IN THE PAGES of the Maintenance Data Sheet Section in this issue will be found another group of articles submitted in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition. One of these will receive the monthly prize of $25 for June. A considerable amount of material has been received so that space limitation prevents publication of it all at this time, but groups will appear in the issue of ELECTRIC RAILWAY JOURNAL devoted to maintenance and construction, which is the third issue published each month, and monthly prizes will be awarded as the articles are published. All material submitted has been of a very high class, and many comments have been received as to the value of the practices described. Several electric railway master mechanics have adopted them already and they should result in particular benefit to these systems and tend to the development of similar practices elsewhere. Full information regarding the rules for the contest was given in the April 16, 1927, issue of ELECTRIC RAILWAY JOURNAL, pages 700-701, and condensed rules and instructions for the contest have been published each week since.

Electric Railway Journal Maintenance Data Sheet

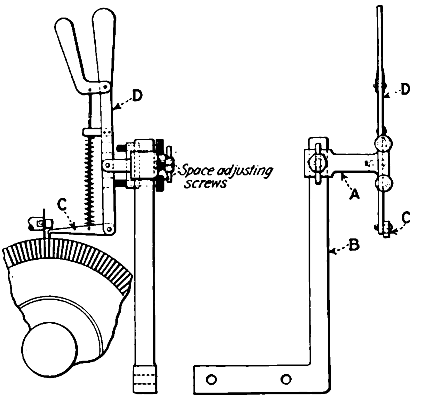
ROLLING STOCK—ELECTRICAL—15

Commutator Bar Spacing Attachment for Slotting Machine*

By Charlie Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

For locating commutator bars properly while under-cutting the mica, a convenient bar spacing attachment is used in the shop of the San Diego Electric Railway. It consists of an upright arm, designated as *B* in the accompanying illustration, which is bolted to the side of the slotting machine opposite the commutator. The dimensions for this arm will vary with different machines, but the upright arm should not be less than ¾ in. round stock to prevent springing.

A sliding bar, designated as *A* in the illustration, slides up or down on the upright arm *B* and holds the pawl-locking mechanism. When adjusted to the proper position, depending on the size of commutator to be slotted, the bar *A* is held in place by a locking screw. The pawl *C* should be long enough to reach to the top center of the commutator and the slot engaging point should be thin enough to enter the slot cut by the saw. It should also be low enough to pass underneath the saw spindle nut as shown in the illustration.



Commutator-bar spacing attachment for slotting machine

In our shop it is the practice to saw one or two slots by locating the bars by hand and then adjust the attachment to the proper height and pitch for the commutator. When once adjusted, the lever *D* is pulled back until it strikes the top space adjusting screw. The pawl *C* is then lifted so as to be free from the commutator and the lever is pushed forward until it strikes the bottom space adjusting screw. The adjusting screws are set so that the pawl moves but one bar and locates the next slot directly underneath the saw.

The lever must not be operated too rapidly as there is danger from the momentum of the armature tending to revolve and so pass the slot, in which the pawl is to engage. A little practice by the operator will enable him to maintain a maximum speed of operation and get the best results.

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*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

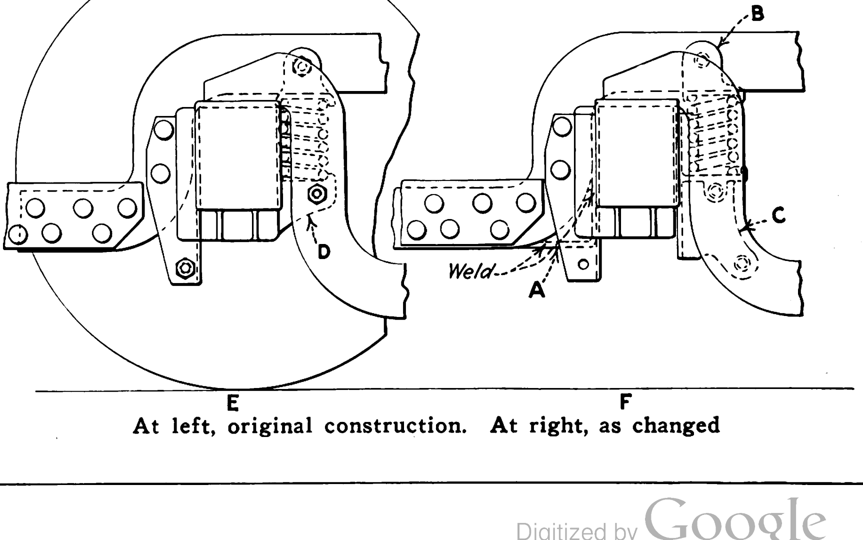
ROLLING STOCK—TRUCKS—9

Changes Reduce Truck Breakage*

By Edwin R. Clarkson
Foreman Equipment Department, United Electric Railways, Providence, R. I.

Due to excessive breakage of standard 0-50 truck frames at the point *D* shown on the accompanying drawing, changes in the method of supporting the frame on the journal box were made. A continual strain was produced at the point where breakage occurred, due to loosening of the bolts through this section. This caused wear and enlarged the holes in the equalizing bars, and the pressure of the brakeshoes against the wheels caused the bolt to act as a swivel to bring excessive pressure against the wear shim, which has no backing. The shim was held in place by two rivets. These wore through and broke.

In the accompanying illustration the sketch at the left shows the truck frame as originally constructed. The section at the right shows the changes that were made. A steel casting, *C*, bolted between the equalizing bars by finished bolts pressed into the casting was substituted for the lug of the journal box. These held the casting in the same relative position as the old lug on the box. The upper spring seat casting indicated at *B* was offset ⅞ in. to line up with the casting between bars, and a forging was welded to the side frame at *A* to provide a solid backing for the pedestal wear shim. The thickness needed was determined by measurements from the center line of the truck frame over the journal boxes allowing for the wear of the shims and for box clearance.



At left, original construction. At right, as changed

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*Submitted in Electric Railway Journal Prize Contest.

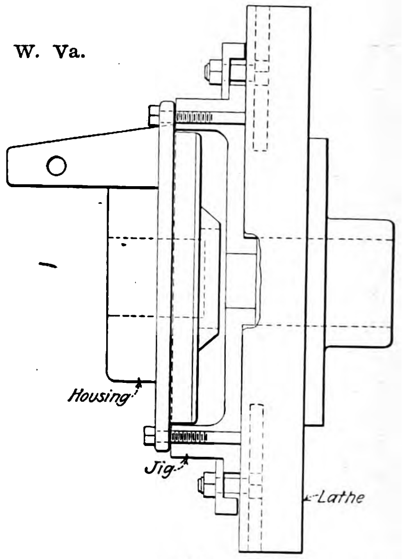
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—16

More Perfect Alignment Results from Boring Armature Bearings After Installation in Housing*

By J. A. Duffy
Superintendent of Equipment
Monongahela West Penn Public Service Company, Fairmont, W. Va.

THE method of finishing armature bearings used on our system is to finish the armature bearing on the outside, then press it into the housing and bore to the proper size for the shaft bearing fit by means of a special jig. The jig is arranged to fasten to the lathe face plate and the housing is bolted to this for the boring operation. Through the use of this practice we have obtained an increase of from 30,000 to 40,000 in the mileage of our armature bearings, particularly on the small Westinghouse 506 motors. On larger motors there has been a much larger increase in mileage obtained. The increased service results from having more perfect alignment of the bearings so that less wear results.


Housing
Jig
Lathe

Assembly of Westinghouse type 306 CV4 motor housing with jig for boring out the bearing

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*Submitted in Electric Railway Journal *Prize Contest*.

Electric Railway Journal Maintenance Data Sheet

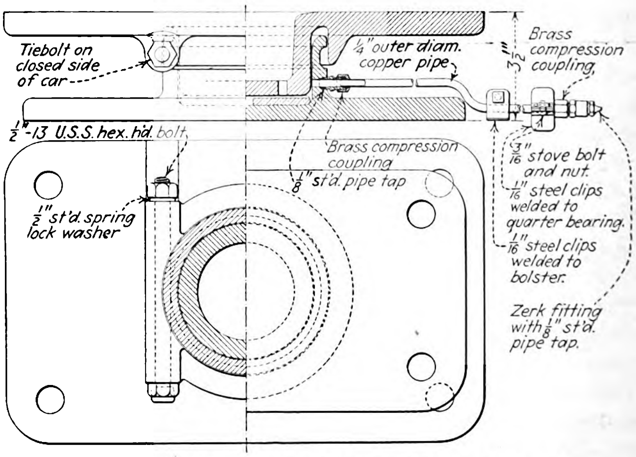
ROLLING STOCK—TRUCKS—10

Simplifying Lubrication of Center Bearings*

By H. S. Williams
Assistant Superintendent of Equipment
Department of Street Railways, Detroit, Mich.

THE lubrication of truck center bearings has proved somewhat difficult of accomplishment due to their inaccessibility. The most common practice is to jack up one corner of the car and apply the lubricant with a gun or similar means. Often the center bearings are lubricated only when a pair of wheels are changed or some other repair is made which necessitates jacking up the car body. It is believed that in order to be effective the lubrication of these bearings must be made easy and so adapt itself to routine periodic treatment.

With this thought in mind the Department of Street Railways, Detroit, Mich., has developed a method of lubrication that is believed to meet all of the requirements of ease of operation and effectiveness. This consists in the equipment of the lower half of the center bearing with a copper tube that leads outward to the extreme end of the truck bolster. This outer end of the tube is fitted with a Zerk fitting. Consequently all that is necessary to apply the lubricant is a Zerk gun. The simplicity of the operation is obvious. In this particular design of the center bearing, a central chamber is provided with holes leading to the bearing surfaces so that any excess of grease or oil will tend to flow into this chamber and thus give the added advantage of an oil reservoir so as to retain the lubricant.


Tiebolt on closed side of car
¼" outer diam. copper pipe
3½"
Brass compression coupling
½"-13 U.S.S. hex. hd. bolt
Brass compression coupling
⅛" st'd. pipe tap
½" st'd. spring lock washer
3/16" stove bolt and nut
1/16" steel clips welded to quarter bearing
1/16" steel clips welded to bolster
Zerk fitting with ⅛" st'd. pipe tap

Method of applying Zerk fitting for lubrication of center bearing

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*Submitted in Electric Railway Journal *Prize Contest*.

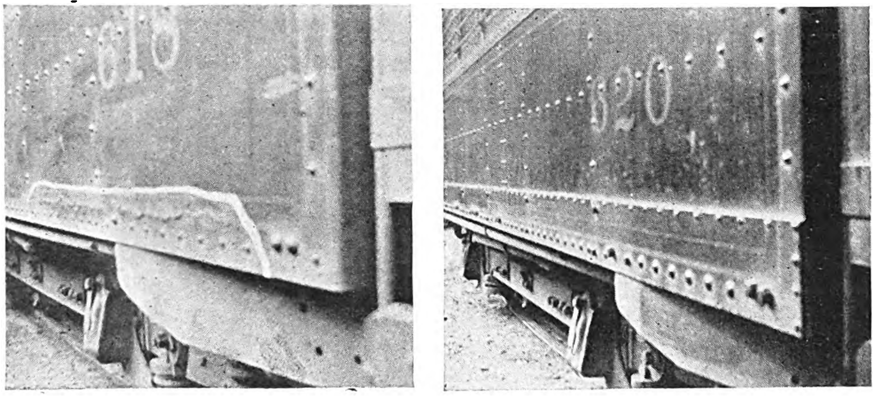
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—CAR BODY—1

Repairing Steel Side Sheets of Cars*

By R. T. Chiles
Master Mechanic Cumberland County
Power & Light Company, Portland, Me.

SOME time ago the Cumberland County Power & Light Company was confronted with the problem of repairing the side sheets of certain standard Birney cars. The side sheets were rusted through just above the top edge of the angle forming the side sill and the bottom side of the floor. The entire renewal of the side sheets would entail heavy expense and so some satisfactory method was sought which would not mar the looks of the car and still not be too expensive. It was decided to install additional steel plates running the length of the car, as shown in one of the accompanying illustrations. In practice, two different sized plates are used; one is $\frac{1}{8}$ in. by $4\frac{1}{2}$ in. wide and the other $\frac{3}{16}$ in. x 6 in. wide. The narrower plate is used where side sheets are rusted through below the bottom side of the floor. This size is less expensive to install and can be put on without removing any of the inside trim. The larger size is used where the side sheet is rusted through above the bottom side of the floor. To attach it the base boards on the inside of the car have to be removed. The method of installing these plates consists of removing rivets that hold the bottom edge of the side sheets to the angle side sill. The plate is marked off from these holes and is drilled for $\frac{3}{8}$-in. x 1-in. carriage bolts. The top edge is drilled for $\frac{1}{4}$-in. by $\frac{3}{4}$-in. stove bolts, holes being spaced on 2-in. centers.



At left, side sheet of car which has rusted through. At right, car repaired by installing a narrow plate along the bottom edge of the car

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

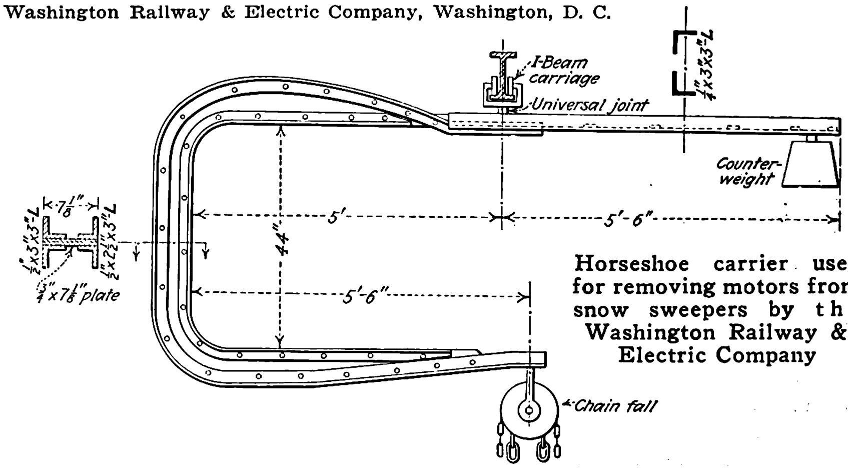
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—1

Carrier for Removing Broom Motors*

By J. B. Blaiklock
Master Mechanic Washington Railway & Electric Company, Washington, D. C.

REMOVAL of broom motors from inside snow sweepers is a difficult and expensive job unless special provision is made for easy handling of the equipment. To meet this condition the Washington Railway & Electric Company, Washington D. C., in its truck shop uses a horseshoe shaped carrier beam, as shown in the accompanying sketch. This carrier is suspended on an I-beam carriage by means of a swivel joint, the I-beam running at right angles to the tracks in the shop so that the carriers can be run with the long extension over the top of the car and the short extension inside the car.



Horseshoe carrier used for removing motors from snow sweepers by the Washington Railway & Electric Company

To remove a motor after it has been loosened from its supports the lower part of the carrier has a chain hoist and the motor is lifted clear with the hoist and the whole carrier is then run out with the motor, which is then lowered to the floor.

This arrangement has proved very satisfactory and not only has saved labor but the ease and expediency of the whole operation have been invaluable in saving time, especially in connection with removal of motors from sweepers, as time is a very great essential when the equipment is needed for service. Such a carrier could also be used to advantage for handling freight in and out of box cars and for loading and unloading material from supply cars.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

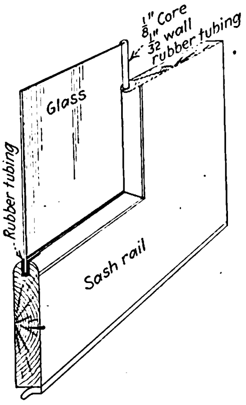
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—CAR BODY—2

Car Glass Set in Rubber Tubing*

By Robert Harris
Master Mechanic New Brunswick Power Company,
St. John, N. B.

MUCH thought is being given to the elimination of noise on electric cars by the New Brunswick Power Company. Vibration and chatter of loose glass have been overcome through the use of rubber-cored tubing. White tubing is used, $\frac{1}{8}$ in. diameter, with $\frac{1}{32}$-in. wall. It is applied to the glass by first splitting it with a sharp pointed knife and then slipping the tube over the edge of the glass, starting in the center of any side, and bending the tubing back over the thumb with the index finger to open up the interior. Care is taken not to set the rubber too tightly lest the corners of the glass cut through. With the rubber tubing in place the glass is set in the sash and retained in place by a sash bead.



Application of rubber-cored tubing to car glass

The tubing which is used by the New Brunswick Power Company costs $1.50 per pound and there are 75 lineal feet to the pound. While this cost may appear greater than either putty or felt, the convenience of handling large quantities, the cleanliness and the reduced labor costs that result add to its advantages.

This method of installing glass has been used by our company for two years and the chatter of glass in sash has been eliminated entirely. Glass breakage has been reduced materially and the rigidness of glass has been of particular assistance in keeping out cold. It is now being applied to windows of car doors and transoms and in fact wherever glass is used in cars.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

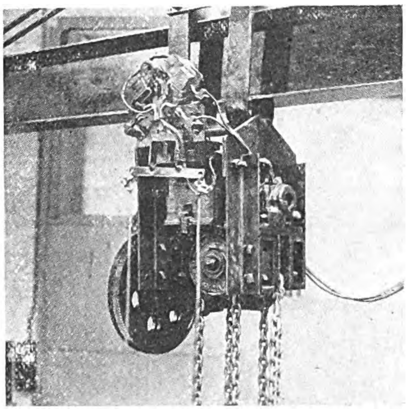
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—2

Electric Hoist Made from Obsolete Air Compressor*

By Equipment Department
Georgia Power Company

AN OLD obsolete National AA1 air compressor and a chain hoist form the nucleus for an electric hoist which was built recently in the main shops of the Georgia Power Company, Atlanta, Ga. The hand chain wheel of the hoist was removed and an air compressor gear was mounted in its place. The lifting chain wheels were also removed and a piece of $\frac{1}{2}$-in. x 6-in. steel with a 3-in. hole, bored central, was placed over the axle between the body casting and the lifting chain wheels.



Type of electric hoist constructed in the shops of the Georgia Power Company

The spacing brackets are bolted to these pieces and to four legs, one at each corner, the legs being made of $\frac{1}{4}$-in. x 2-in. angles. The legs are joined at the top by separators made of $\frac{1}{4}$-in. plate through which a $1\frac{1}{4}$-in. bolt passes to fasten the hoist to the carriage which runs on top of an I-beam. The top side of each spacing bracket forms a seat for each corner of the motor portion, which is the electric portion of a National AA1 compressor. The motor portion is bolted to the brackets.

The pinion on the armature shaft engages with a second pinion, which in turn engages with the gear attached to the hoist. The second pinion was needed as the gear centers were too far apart. The idler pinion runs on a shaft fastened in the motor frame.

The starting and reversing switch is made of type R governor parts. The contact arm is mounted on a fulcrum pin set in an insulated plate and four contacts are mounted on the arm in pairs. The top contacts are connected to the trolley, the bottom contacts to one side of the fields, and the other side of the fields is connected to ground. Of the four stationary contacts the top two go to each side of the armature and the lower two connect to each side of the armature opposite from the top contacts. This provides for reversal of the armature current.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—3

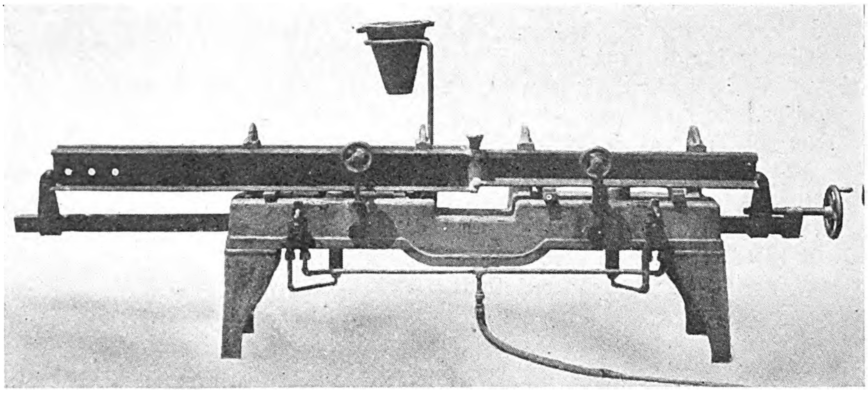
Machine Holds Rails While Welding Compromise Joints*

By A. Taurman
Superintendent of Equipment, Way and Structures, Birmingham Electric Company, Birmingham, Ala.

When the Birmingham Electric Company adopted A.E.R.E.A. 7-in. girder rail for replacing special work as it is renewed we were confronted with the problem of providing a satisfactory and economical compromise joint, to take care of connections of the two different sections of rail. In renewing special work on our lines, most of it has to be done under traffic and therefore it is impossible to weld compromise joints in the track economically.

To reduce the time and cost for setting up and welding the compromise joints a special machine was built for holding and aligning the rails while they were being welded. The machine has a cast-iron frame with four upright arms. These are planed to an accurate surface so as to align the rails. The machine is also provided with a screw clamp for pulling the rail ends together so as to secure a perfect thermit weld.

Prior to the building of this machine it required from one to 1½ hours to line up the rails and clamp them in position for welding, and then we were not always able to secure a straight joint after they were welded. With this machine but five minutes is required to put the rails in place and turn on the air in the cylinders for clamping, and the rails are held in line perfectly.



Rails in position after making a compromise joint

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*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

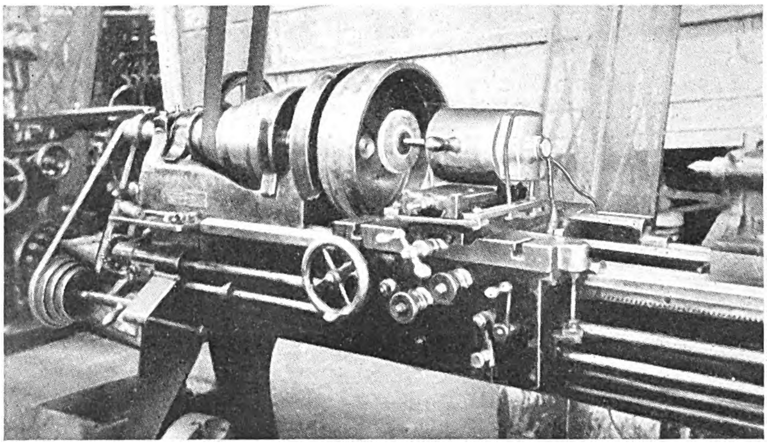
BUSES AND TRUCKS—1

Regrinding Brake Drums for Buses*

By C. H. Copley
Superintendent Springfield Traction Company, Springfield, Mo.

Both internal and external brake drums can be reground satisfactorily by a very simple method. This not only keeps the drums from the scrap heap, and so decreases the number of new ones that must be bought, but it also decreases maintenance expense due to the lessened wear on the brake linings which results from the smooth surface.

The method used in our shop is to put the drum in a lathe and true it up with a cutting tool. A small portable track grinder is then attached to the lathe tool rest. This is driven electrically and the drum is revolved slowly in the opposite direction to the grinding wheel. By mounting the grinder on the tool rest the grinding wheel can be moved in or out and back and forth as desired. The grinder which we use runs at a speed of 2,750 r.p.m. and a beautiful finish results.



Brake drum set up in lathe for grinding

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*Submitted in Electric Railway Journal Prize Contest.

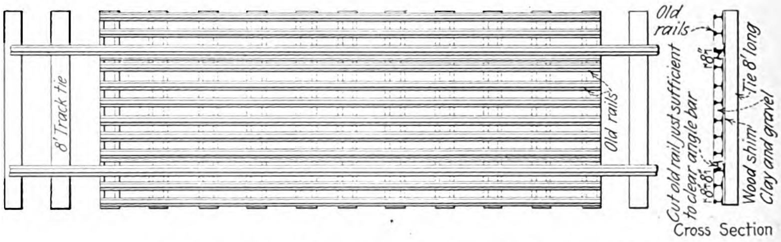
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—4

Old Rails Used for Railroad Crossings*

BY F. H. MIDGLEY
Engineer Grand River Railway and Lake Erie & Northern Railway, Galt, Ontario

TO EFFECT economy in the cost of renewing planking of highway crossings, our systems have adopted a crossing made up of scrap rails as shown in the accompanying illustration. Plank crossings last but eight months, while the crossings made by using scrap rail are good practically for all time with an occasional disturbance to renew the crossties.



Method of making crossing by use of old rails

Our running rail is 85 lb. and we use 56-lb. scrap rails laid parallel to the tracks for the full width of the ties, spiking them to the ties at about 8 in. centers. To provide flangeways the rails adjacent to the running rails are laid on edge. The space between rails is filled in with gravel and clay and sprinkled with crude oil about twice a year. We have put in many crossings of this type on paved streets, and municipal and other officials have expressed themselves as being perfectly satisfied.

The cost of a 20-ft. crossing laid with rail is $20 for twelve 56-lb. scrap rails 20 ft. long, approximate weight 2 tons, and $18 for the labor of installation, making a total of $38. The same length of crosing laid with 4-in. planks would cost $40.50, made up of $19.20 for six pieces of planking 4 in. x 12 in. x 20 ft. long, two pieces of 56-lb. scrap rail $3.30 and the labor of applying $18. The initial cost of the rail crossing is less.

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*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

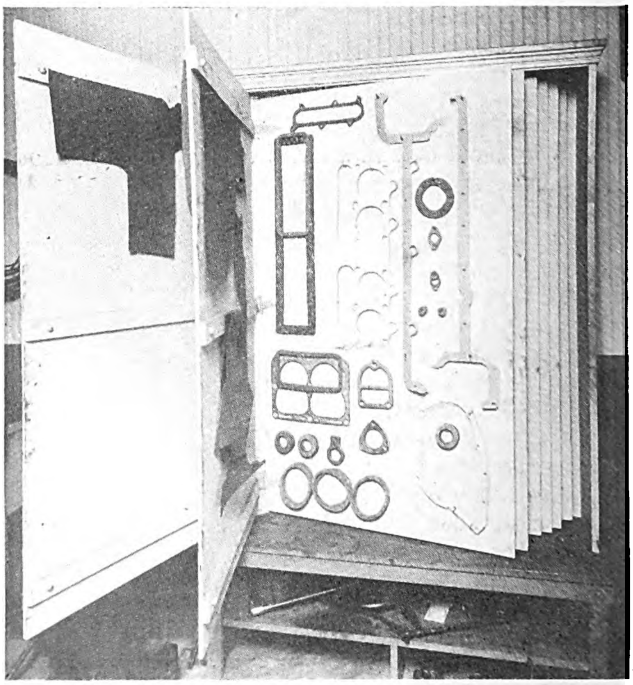
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—2

Hinged Gasket Boards Conserve Space*

BY ROBERT M. O'BRIEN
Superintendent of Rolling Stock and Shops New Orleans Public Service, Inc., New Orleans, La.

THE accompanying illustration shows a type of gasket board that is proving of particular benefit at our bus garage. It consists of nine hinged boards or leaves which fold up like a book. The capacity of such a board for a given amount of space is obviously very large. In addition to this the advantage of having gaskets hung neatly so that they cannot be bent or broken is proving of particular advantage. Certain leaves are used for different types of buses, so that the location of any particular gasket becomes but a moment's job. Depletion of the stock is very noticeable with this type of board.



Gasket boards are hinged so as to fold into a small space

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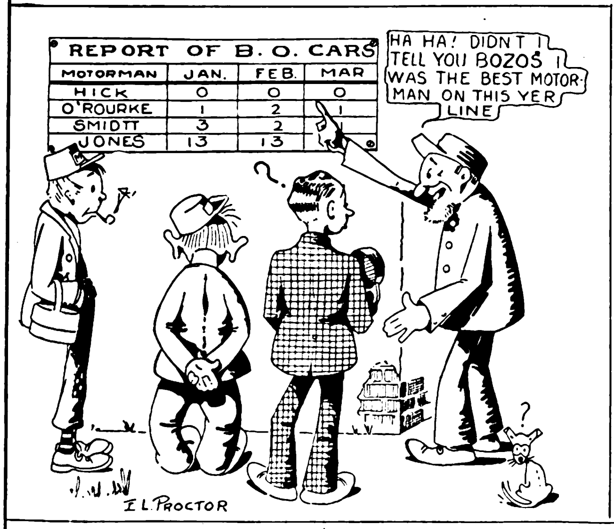
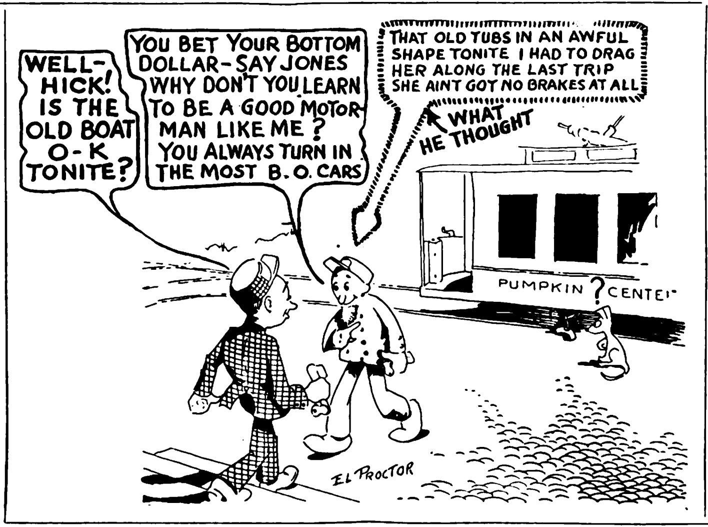
*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Adventures of Old Man Trouble


REPORT OF B. O. CARS
MOTORMAN | JAN. | FEB. | MAR
HICK | 0 | 0 | 0
O'ROURKE | 1 | 2 | 1
SMIDTT | 3 | 2 | 1
JONES | 13 | 13
HA HA! DIDN'T I TELL YOU BOZOS I WAS THE BEST MOTOR-MAN ON THIS YER LINE
E. L. PROCTOR

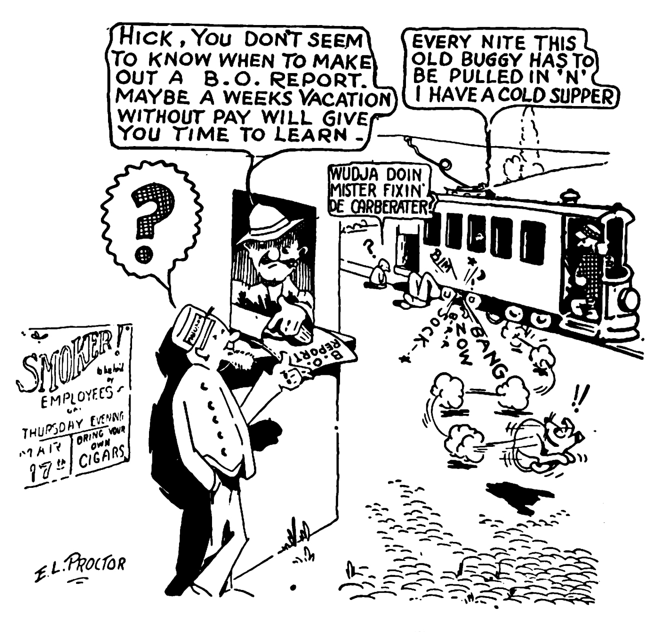
on the Hicksville Railway

A GOOD motorman is not determined by the fewest number of bad-order cars which he reports. The repair of cars is the particular job of the mechancal department, and by reporting bad-order cars promptly motormen are co-operating to reduce detentions in service and decrease annoyance to passengers.


WELL- HICK! IS THE OLD BOAT O-K TONITE?
YOU BET YOUR BOTTOM DOLLAR-SAY JONES WHY DON'T YOU LEARN TO BE A GOOD MOTOR-MAN LIKE ME? YOU ALWAYS TURN IN THE MOST B. O. CARS
THAT OLD TUBS IN AN AWFUL SHAPE TONITE I HAD TO DRAG HER ALONG THE LAST TRIP SHE AINT GOT NO BRAKES AT ALL
WHAT HE THOUGHT
PUMPKIN ? CENTER
E. L. PROCTOR

Your physical energy and the railway's financial energy are drained by worrying along with a car unfit for service.

Electric Railway Journal will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.


HICK, YOU DON'T SEEM TO KNOW WHEN TO MAKE OUT A B.O. REPORT. MAYBE A WEEKS VACATION WITHOUT PAY WILL GIVE YOU TIME TO LEARN -
EVERY NITE THIS OLD BUGGY HAS TO BE PULLED IN 'N' I HAVE A COLD SUPPER
WUDJA DOIN MISTER FIXIN' DE CARBERATER?
?
BIM
SOCK
B-R-R
ZOW
BANG
!!
B.O. REPORT
SMOKER! to be held by EMPLOYEES on THURSDAY EVENING MAR 17th BRING YOUR OWN CIGARS
E. L. PROCTOR

I. M. Zimmerman and E. L. Proctor, West. Elec. & M'g. Co.

Improved Equipment

Additional Tools for Electric Railway Maintenance

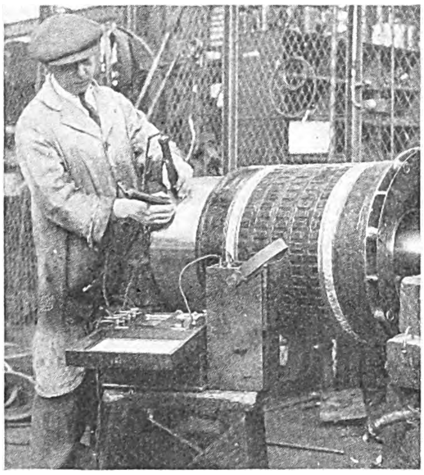
MANY letters of commendation have been received from our readers regarding the value of short descriptions of improved equipment for railway maintenance. We started the publication of such items in the March 19, 1927, issue, in which sixteen pages were included. Additional items were published in the April 16 and May 21 issues and now we are adding the fourth installment. Such descriptions of the latest tools which can be adapted to electric railway maintenance work enable those responsible for maintenance practices to visualize the shortcomings of their particular equipment and provide for changes which will put their maintenance work on a higher plane. Modern tools speed up repairs and assist in making a railway prosperous.

◆

Low Resistance Test Set

EVERSHED & VIGNOLES, LTD.,
Chiswick, London, England

FOR testing railway armatures, locating bad rail joints or other low resistance measurements a direct reading low resistance ohmmeter known as the "Ducter" is available. This set gives direct readings of resistances from 5 ohms down to 5 microhms and as no adjustments are required observations can be taken very quickly. The method employed for testing armatures is shown in the accompanying illustration, which was taken in the Durnsford Road repair shop of the Southern Railway, London, England.



The "Ducter" test set consists of two coils mounted on a common axis and swinging in the field of a permanent magnet. The coils are fixed at a definite angle on their mounting and carry a pointer moving over a scale marked in microhms. Current is supplied by a battery and the current or control coil is tapped across a shunt in one of the battery leads and, therefore, carries a current proportional to the total current flowing in the main circuit. The potential coil is tapped off the resistance under test and carries a current proportional to the potential drop across the resistance. As the movement is not controlled by any other forces, its final position is dependent only on the ratio of the total current to the potential drop through the resistance. Fluctuations in battery current have no effect on the accuracy of the readings within ordinary working limits.

Axle Lathe

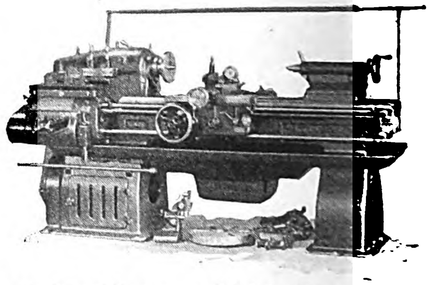
NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

DESIGNED for production work on axles, the bed of this lathe is rigid and is reinforced by cross-girts of box section 8 in. wide. The carriage bearings consist of a flat way at the back of the bed and a way of compensating V shape at the front, with angles of 15 deg. and 70 deg. The center driving head completely incloses the main driving gear, forming an oil reservoir for it. It is adjustable longitudinally along the bed. The main drive is by a large steel herringbone type gear and pinion carried between bearings in the head. The two carriages have power longitudinal feeds, by a right and left-hand screw positively driven by gearing. A complete lubricating system for the tools consists of pump, jet pipes, reservoir and collecting channels. The tool slides have a trough connected with channels in the carriage bridge for carrying off the lubricant. The aprons are double-walled and all of the mechanism, except the operating levers, is completely inclosed, as are the feed gears, at the right-hand end of the bed. The carriages have hand traverse on the bed and the tool slides have hand cross feed. The axle is carried on dead centers mounted in two heavy tailstocks, which are adjustable longitudinally along the bed and can be clamped in position by four anchor bolts. To prevent slipping, a pawl engages a rack cast in the bed. A handwheel adjusts the spindle of the right-hand tailstock. These machines can be driven by a single or cone pulley or by a constant or adjustable speed motor.

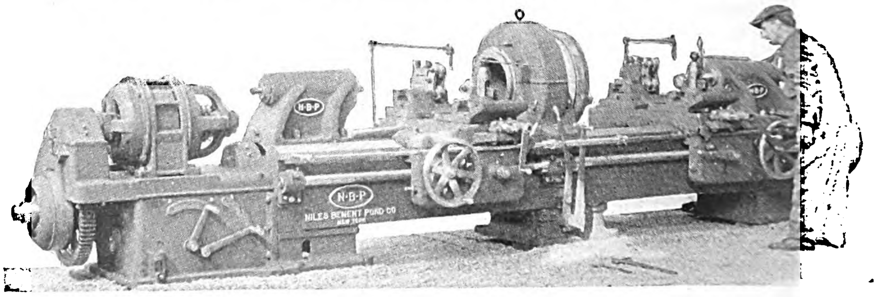
16-in. Lathe

PRATT & WHITNEY COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

LATHES of this type can be furnished either with a geared head for independent motor drive, with a single pulley or with a cone pulley head for belt drive. The back gears of the headstock are mounted below the spindle. The headstock is centered over the bed and the operator is given greater freedom of movement and uninterrupted light on the work. The sliding speed change gears are made of hardened chrome-vanadium steel. They are fully inclosed and splash oiled and are shifted by two levers on the front of the head. The cone head has a solid housing and the same back gears as the gear head.



The positions of the ratio lever and rocker arm for any desired feed or thread are located by a large direct reading index plate mounted on the quick-change gear box. The compound rest handwheel is set at an angle of 20 deg. above its screw. This allows headroom and provides space for a large legible dial graduated in half-thousandths to conform to micrometer readings. The lever operating the combined stop and reverse rod is located at the right end of the apron. For fine threading the handwheel may be disengaged from the rack pinion through the knob to the right of the large handwheel. The apron is also equipped with

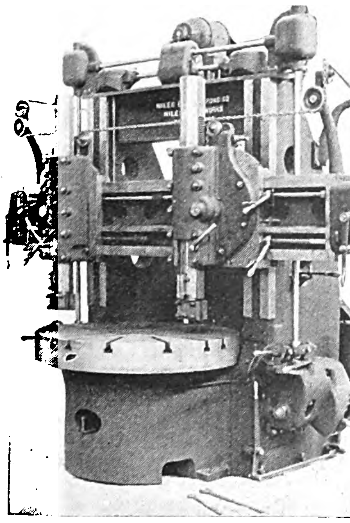


the usual knob for power cross feed and lever for engaging the screw. A taper of 45 deg. may be cut by the simultaneous use of both cross and longitudinal power feeds. The tailstock has a long solid barrel and a large graduated spindle. It is clamped to the end by an eccentric shaft parallel to the spindle, and the same handle provides a means of moving it along the bed.

Boring and Turning Mill

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hartford, Conn.

BOX-GIRDER, double-webbed housings without an opening in the front are used in this boring and turning mill, the cross rail elevating screws being located between them. They are bolted securely to the bed and are tied together firmly by a heavy top brace. The table, supported by an annular bearing, running in a bath of oil, is driven by a bevel gear. For clamping purposes the table is regularly provided with four pairs of parallel T-slots and eight radial T-slots. The spindle is long, of large diameter, and has upper and lower bearings. The box-girder cross rail is of the three-track type, having a narrow guide at the bottom with a saddle traversing screw located between the guiding surfaces. The saddles have accurately scraped bearings on the cross rail. The boring bars are steel forgings of octagon section. The tool holders are steel forgings with provision for clamping tools for boring, turning and facing. They have straight shanks and may be easily removed for the insertion of special boring bars or cutters. The feeds are positive, continuous and independent for each head, both in amount and direction.

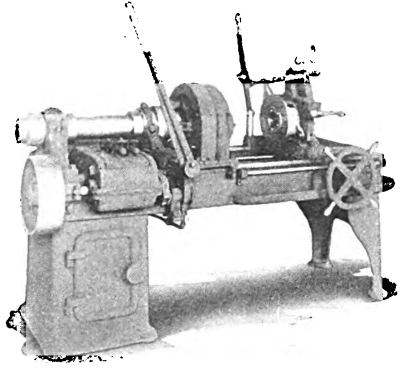


Eight different feeds for cross, vertical and angular feeding can be obtained by levers on the two feed boxes. Rapid power traverse for the saddles and boring bars is controlled by a lever located above the feed box and near the work. This lever has four positions, two of which engage rapid power traverse in either direction and the other two engage power feed, fine and coarse. The machine can be driven by a belt or by means of a constant or adjustable speed motor.

No. 2 and No. 3 P.D.Q.C. Improved Pipe Machine

BIGNALL & KEELER MACHINE WORKS
OF THE N. O. NELSON MANUFACTURING COMPANY,
Edwardsville, Ill.

MACHINES of this line take their name from the use of the Peerless die and quick chuck. They are said to have proved popular for threading small sizes of pipe. The cut-off tool is made of beveled high speed steel, and the reamer and thread-length gage aid in producing good work. Designed for single pulley operation, a constant speed electric motor can be used if desired. Shifting the gears in the gear box permits of obtaining six spindle speeds. The Peerless die head is provided with five dies per set. The die has a full bearing against the cam ring. Turning the adjusting screw expands or contracts the dies for threads of different gages. The quick acting chuck is made with tempered tool steel grippers with M form teeth which can be sharpened. A Landis die head can be furnished.

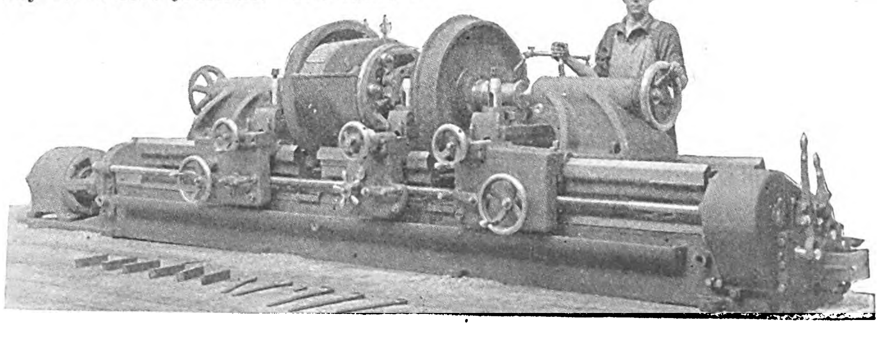


The No. 2 machine is capable of handling $\frac{1}{4}$-in. to 2-in. pipe and the No. 3 $\frac{1}{4}$-in. to 3-in. pipe. The No. 2 machine occupies a floor space of 28 in. x 77 in., whereas the No. 3 occupies a space of 30 in. x 90 in.

Combination Journal Turning and Axle Lathe

NILES TOOL WORKS COMPANY
Division of Niles-Bement-Pond Company,
Hamilton, Ohio

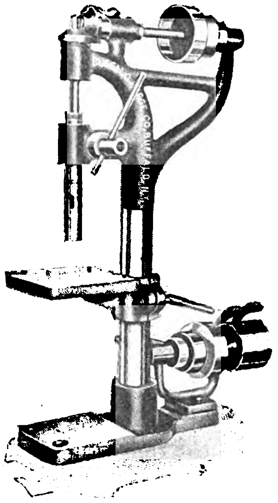
EITHER outside or inside journals can be turned simultaneously with this machine on axles having wheels up to 42 in. diameter on the tread, with wheels in place. When being used as an ordinary axle lathe, the outside carriages are arranged for turning collars, outside journals, sand guards and wheel seats, when the wheels are not in place. The inside carriages are used only for inside journals. The lathe is of the center drive type, the top portion of each end of the bed being arranged to slide and thereby forming gaps to allow mounted wheels to clear. The center driving gear has a projecting sleeve or bearing on each side and the gear is in halves, the drive being by a pinion carried in the bed. The center head has a hinged cap which completely covers the center gear and forms a continuous bearing for it. The four carriages are fitted with longitudinal feeds by screw and bronze nuts of the open and closed type. The tool slides on the outer carriages have hand cross feed and those on the inner carriages have hand and power cross feeds. Burnishing attachments are furnished on the two outside carriages only. Two tailstocks carried on the upper bed members have spindles which are adjusted by means of hand wheels.



Power Bench Drill

BUFFALO FORGE COMPANY.
Buffalo, N. Y.

CORRECT alignment of gears and shafts in the Buffalo 10-in. power bench drill shown is insured by its substantial one-piece frame. The upper cone pulley is supported between the bearings instead of being overhung. This reduces unnecessary strain on the shaft. The countershaft has tight and loose pulleys and a belt shifter. Feed lever and spindle are held by means of a friction spring, assuring the spindle remaining where placed. The work table is adjustable up and down or can be pushed to one side. The bench can also be used as a table, since it is planed carefully and accurately and has countersunk bolt holes. It will drill holes up to $\frac{9}{16}$ in. with great speed.



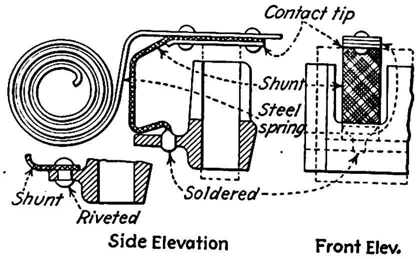
Combination Riveting and Brake Relining Machine

RELINING of bus brakes and for countersinking and riveting is the function of a new type of equipment put out by the Manley Manufacturing Company, York, Pa. The machine consists of a drilling and countersinking mechanism, together with a heavy-duty riveting machine mounted on a support that serves as a bench. This has heavy iron legs with a natural wood top. A clamp is provided for holding the brake lining while cutting. A rod for holding the rolls of brake lining is also provided.

The drilling and countersinking machine operates on a different principle from that usually employed. The hole in the brake lining is drilled independently, using the holes in the brake band as a templet. The countersinking is done from underneath by reverse action.

Twin-Washer Brush-Holder Mechanism

TO MEET the demands of a large number of railway operators for a brush-holder pressure finger with few wearing parts and one which can be applied generally to a large number of old and new types of railway motor brush-holders, the Westinghouse Electric & Manufacturing Company has developed the twin-washer type brush-holder mechanism. The entire movement over the brush range is obtained by the opening and closing of the spring itself, there being no movement between the barrel and the shaft. Adjustment of pressure is made only in the shops.



Method of attaching shunt to new type brush-holder mechanism

The finger is designed to use a twin-washer and a barrel adjustment on a $\frac{3}{8}$-in. diameter spindle instead of the harness with ratchet and pawl. The twin-washer limits side play of the spiral spring and the barrel gives a satisfactory adjustment. The end of the spiral spring extends out over the carbon box and has a flat contact tip and a braided shunt riveted to it. This provides a contact tip that is easily renewed. The end of the shunt is twisted and soldered into a $\frac{7}{32}$-in. diameter hole in the bottom of the casting.

The new pressure finger is interchangeable with all of the harness type fingers using a ratchet and pawl with a few minor changes. To mount the new fingers in old brush-holders, the $\frac{5}{16}$-in. hole for the spindle should be reamed to take the new $\frac{3}{8}$-in. spindle. A $\frac{7}{32}$-in. diameter hole should be drilled in front of the two holes that were used for the spring clips and the shunt soldered into the casting. After assembly a hole should be drilled through the casting and spindle for a $\frac{1}{8}$-in. cotter to anchor the spindle to the casting.

Dick Prescott Shows His Spirit

And Wins the Men

WHEN Dick Prescott, assistant superintendent in the Consolidated Railway & Light Company's shop, started for the truck shop with Bill Johnson, the foreman, the young executive did some very fast thinking. Consequently as he approached the group of workmen idling at one corner of the shop, after having refused to go to work, he had determined his course of action.

Dick knew that he had little chance of successfully handling the situation if he permitted himself to be drawn into a purposeless argument with the entire disgruntled group. On the other hand, he had come to the shop himself to face them instead of sending Bill Johnson back with a message.

As he entered the shop the men saw him coming, and there was an ominous silence.

Dick stopped and surveyed the group for a moment before speaking.

"What's the trouble with you men?" he asked. "Why aren't you all on the job?"

"Aw, dis is a helluva shop t'work in," spoke up "Shorty" Green, pal of Pete Welcher and one of the instigators of the present trouble, who was standing far enough back in the crowd to think he was out of Dick's sight.

"I wish the man who made that remark would step out here where I can see him," quickly snapped Dick. Nobody moved. After waiting for a moment the young executive, though realizing that this was a critical moment, spoke deliberately.

"I don't know what you men have on your minds," he said. "If any of you have received unfair treatment, either at my hands or by one of the foremen, I want to know it.

"This is a good shop to work in. No man who is doing an honest and capable day's work needs to worry about his job. But this sort of thing won't go. My door is always open to any of you who has a fair grievance. I want you to get on your jobs immediately. If there is something you want to bring to my attention, select three of your number and send them to my office during the lunch hour today. I shall be glad to talk with them then."

Dick turned on his heel and walked away from the group, which remained silent for a moment after he had gone.

"I think dat's a damn sensible suggestion," remarked big Pete Thompson, glancing after the disappearing form of Dick Prescott. "Why should we all act like a lot of nuts just because a few guys get what they think is a grievance. I think it's a grouch, not a grievance. If some of you guys would do more working and less talking you wouldn't have so many troubles. I notice Shorty back there did a helluva lot more talkin' before the boss got down here than he did when he had a chance to tell his troubles to somebody who could do somethin' about it."

"Why didn't you say something?" queried Shorty.

"I ain't the guy dat started dis." snapped back Pete. "Dis is a good job and I don't want'a lose it, either. I'm goin' back to work."

Pete was soon followed by some of the others, and after a few moments even the ringleaders of the movement reluctantly gathered up their tools and resumed work.

Association News & Discussions

Don't Be Too Easily Satisfied, Urges President Sawyer

President Sawyer, Managing Director Storrs, Charles Gordon and J. W. Colton Give National Perspective of Industry to Midwest Electric Railway Men During Annual Meeting

"WE ALL need a mental inventory," declared W. H. Sawyer, president of the American Electric Railway Association, in addressing the annual meeting of the Mid-West Electric Railway Association, held in St. Louis, Mo., on June 9-11, 1927.

"As I have traveled to various cities and talked with railway men who are doing things," said the national president, "I have become convinced that most of us who have been inclined to feel that we are doing a fairly good job are barely scratching the surface of the possibilities for progress in many directions. I believe that we need a mental inventory. We have been too easily satisfied. There are many opportunities for improvements in practices on our properties and in our method of conducting operations that will improve the showing on our balance sheets. On every hand there are examples of properties that are doing an improved job. If we will combine on our own properties each advance step taken by those who have been going ahead in certain directions, the opportunities for improving the condition of our properties are manifold. If we will open our eyes and our minds to what others have already done we can find many things in successful practice which we have dismissed as impossible. Likewise, there are many suggestions for new ways of improving performance and net revenue."

Speeding up of service was one of the things that Mr. Sawyer mentioned specifically as offering ample room for improvement on most properties, once there is the determination to go ahead despite obstacles and objections.

Increase of courtesy on the part of employees was cited as another example of a wide field for improvement despite the progress which has been made in this direction. The management's own performance in transmitting inspiration to its employees was still another phase of the present-day problem which the speaker felt could profitably be subjected to critical and intensive analysis on most properties. Likewise, the practices and methods in the shop, and maintenance performance in general were held to be subject to substantial improvement. In acquiring a knowledge of merchandising and advertising methods and their application to the transportation business, the industry has barely started, according to Mr. Sawyer. In working out the proper methods and angles of approach for the improvement of community relations, there is much more to be learned than is now known. Only a start has been made in the improvement of cars and the character of the ride sold by most railway properties.

"Public transportation is a necessity to community existence and progress," continued Mr. Sawyer. "It must be furnished by some agency. If the men now at the helms of these many properties don't find a way to provide better transportation, somebody else will. Improvements will be made, either by us or by some one else. This convention will have been most successful if we each leave here convinced that we have not been doing all that it is possible to do; if we leave with the determination to go back to our properties questioning every method and every precedent that we have been inclined to consider good enough, or the best that could be expected in the circumstances."

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 19-23—**International Street and Interurban Railway Association, annual conference, Copenhagen, Denmark.**

June 20-24—**American Society for Testing Materials, 30th annual meeting, French Lick Springs Hotel, French Lick, Ind.**

June 20-24—**American Institute Electrical Engineers, convention, Book-Cadillac Hotel, Detroit, Mich.**

June 24-25—**New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

June 26-27—**Public Utilities Advertising Association, Hotel Albany, Denver, Col.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 22-23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Sept. 13-15—**International City Managers Association, Dubuque, Ia.**

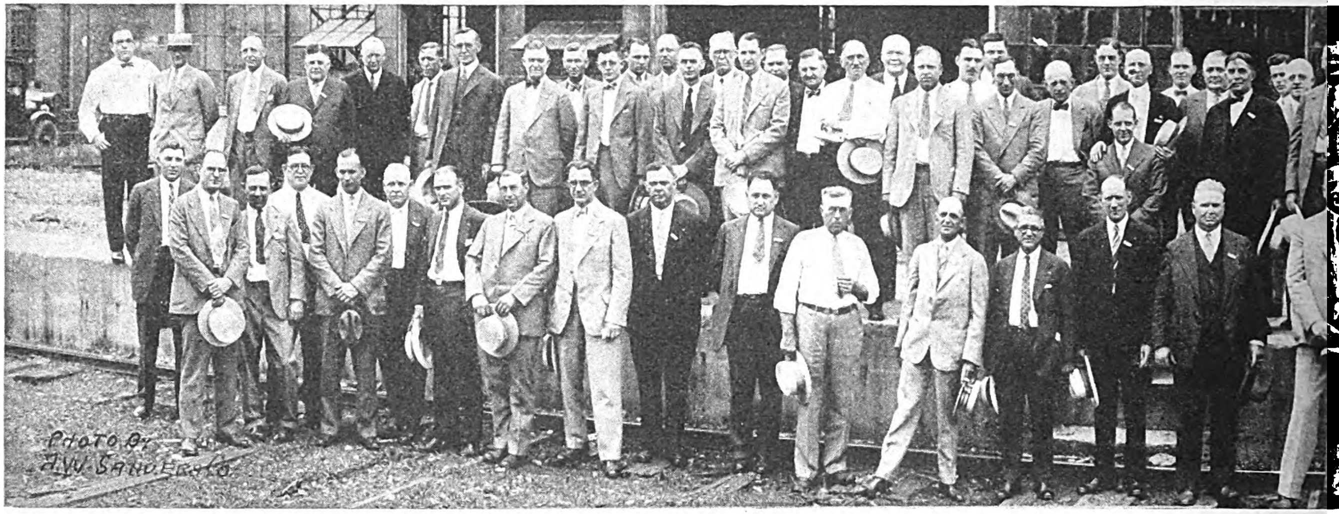
Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Mr. Sawyer pointed out some of the signs of progress which he had observed in visits to various properties. He said that the transportation systems in most of the larger cities of the country have definitely turned the corner and are going forward. He mentioned Chicago as a city in which the railway, though a part of the lines are technically in receivership, is making improvements rapidly and is actually on a profitable operating basis.

Milwaukee was cited as another example of real progress. New track is being built, cars are being improved, new lines on private right-of-way are being put in to speed up suburban and interurban service. "In Milwaukee they are spending large sums of money for the betterment of service," he said. "They believe in the electric railway business, and they are backing their opinion with good money. They are looking not to tomorrow, but into the future—five years, even ten years in some cases. They are making plans there that promise to give Milwaukee one of the finest transportation systems in the country. They are trying to not only meet the needs of the city but to anticipate them. They have met opposition at each step, but they are determined to progress, and the results they are accomplishing more than justify their spirit and confidence.

"I had the pleasure of talking to 700 graduates of educational classes in the employees' mutual benefit association in Milwaukee. There were 700 employees who are trying to better themselves. It was an inspiration to me. On that property they have succeeded in arousing an incentive and a spirit that has few parallels in our industry. The management there is getting co-operation from its employees because it is giving co-operation."

Referring to the work of the American Electric Railway Association, President Sawyer explained the reasons for the proposed revision of dues that will be submitted to the coming convention in Cleveland. He called attention to the low rate which has existed in the railway association in comparison with the other utility asso-



Delegates to the annual meeting of the Mid-West

ciations. He pointed out that the revised constitution is to be submitted only after a very careful study has been made of all the association's activities, with a view of ascertaining that the industry is getting full value for its money.

He also outlined the changes which are to be made in the association's magazine, *Aera*, including elimination of advertising and reduction in the number of pages of general articles suitable for publication in the technical press. Through reduction in bulk it is hoped not only to save money but to make the information published more readily available. At the same time an effort is to be made to direct *Aera* more definitely to the purpose of promoting the association and the industry through fuller interpretation of the work of the association and its committees and through publication of material that will be inspirational to individual member employees. Fuller co-ordination between the association and the industrial press was given as another reason for the change.

After having visited the National Electric Light Association convention at Atlantic City, President Sawyer said that he was more convinced than ever of the wisdom back of the decision to take the railway convention to Cleveland a second year. He said that a recent visit to Cleveland impressed him with the fact that the convention committee there is on its toes and that satisfactory arrangements are being made rapidly. More than 80,000 sq.ft. of exhibit space had already been sold in comparison with 60,000 sq.ft. at the same time last year. One of the most promising features of present developments is the assurance of a car exhibit that will probably exceed that of last year in point of size and interest.

Although neither Lucius S. Storrs, managing director of the association, nor J. W. Colton, editor of *Aera*, was able to be present personally, papers which they prepared were read by Labert St. Clair of the association staff. Mr. Colton discussed the subject of municipal ownership of railways in the United States, outlined the history of the municipally owned properties in the country and cited their records of experience to refute the contention by municipal ownership advocates that public ownership and operation, with its attendant political meddling, has any advantages for the riding public.

Mr. Storrs again called attention to the need for co-operation between management, public and employees. He outlined the fundamentals to successful local transit as laid down by the advisory Council, emphasizing the obligations of each of the three groups that have an interest in transportation. He considered it significant that transportation progress has occurred rapidly wherever the three groups have abided in the main by the principles necessary for fair dealing.

Mr. Storrs declared that the industry is making definite progress in many more cities than is generally recognized. The fare issue, which was once the chief cause of controversy in almost every city, no longer is the dominating one in most communities.

"I have seen many complicated transit situations," concluded Mr. Storrs. "Some of them seemed too tangled ever to be straightened out. But I have found that when citizens of constructive minds, business men and other leaders who had the welfare of their communities at heart, began to take an interest, the negotiations got some place."

Another national view of the railway situation was given in an address entitled "You Can't Sell Cotton Goods in a Silk Age," by Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, which is printed elsewhere in this issue.

WELCOMED BY MAYOR

Victor J. Miller, Mayor of St. Louis, welcomed the Mid-West Association to the city. In responding, A. T. Perkins, manager for the receiver of the United Railways of St. Louis, said that the backing of responsible business people is essential in establishing improved public relations. In winning this backing, he said, there are two ideas which have not been sufficiently developed, namely, that the electric railway is a large buyer in the local market and railway employees constitute a large body of retail customers whose jobs depend upon the continued existence of the transportation company.

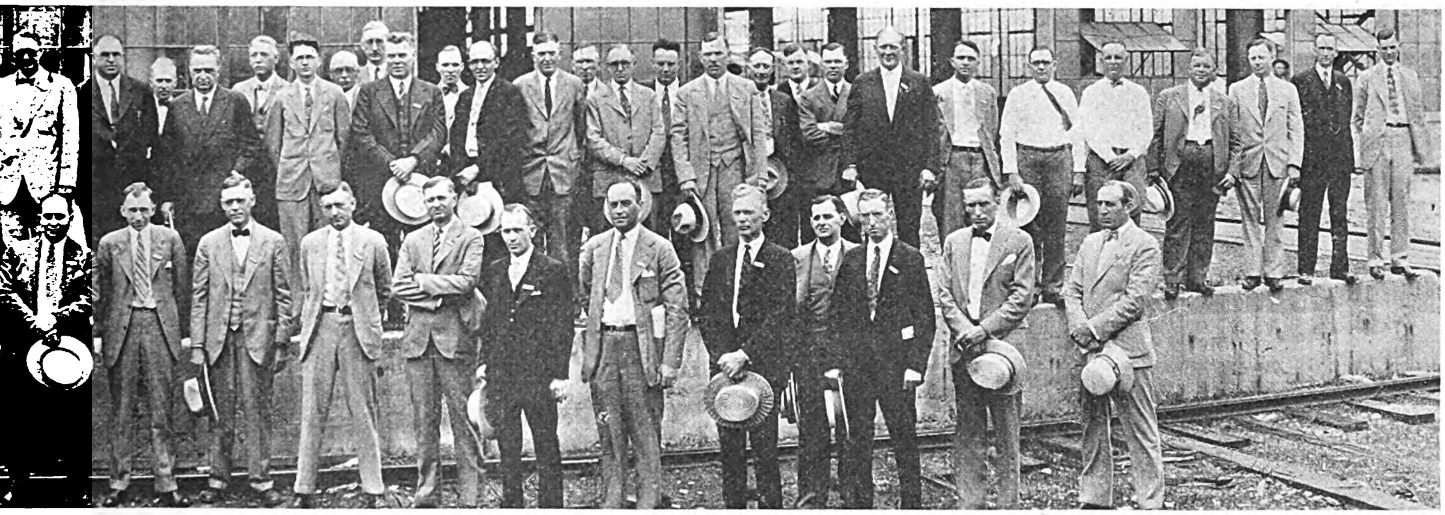
As an example of the importance of a railway in the local market, Mr. Perkins said that his property purchases 18,000 different items of material and supplies from 900 factories in the St. Louis district and at an annual cost of $3,000,000. From the standpoint of employee purchasing power the speaker estimated that the 6,000 employees of the United Railways, a large part of whom are buying homes, constitute with their wives and children some 20,000 retail customers.

Dr. Robert Hyland, chief surgeon United Railways of St. Louis, talked on the work of a medical department in a railway organization and its importance in keeping employees contented and efficient through care of their health.

A question regarding the proper basis for setting up pension reserves, so as adequately to meet the need of increasing age among employees was raised by F. G. Buffe, vice-president and operating manager Kansas City Public Service Company. Adequate reserves are necessary, in the opinion of Mr. Buffe, to take care of the reduced turnover with advancing age which results from a pension system.

"The Human Element in Industry" was the subject of an address by E. S. McClelland, director of personnel Westinghouse Electric & Manufacturing Company. He defined the personnel department of an organization as the agency responsible for breathing into it and maintaining the spirit of its founder. Maintenance of a proper morale among employees, he explained, involves dealing with the elusive and delicate reactions of human nature. Credit and adequate recognition of the worker's part in any business organization was held to be essential to effective teamwork.

J. B. Sheridan, secretary Missouri Committee on Public Utility Information, talked on the value which utility service confers upon communities. He said that undeveloped land has little value for residential or business purposes until transportation and other utilities come in. The average real estate dealer does not sell only land. The value of utility service is a large part of the selling price, and the land speculator pockets the profit while the utilities continue to bear the burden of



Electric Railway Association held at St. Louis June 9-11

rendering service in sparsely settled territory. It is this interest of the land speculator, not the public itself, which produces the continuous pressure for railway extensions into new territory.

Speakers at the banquet on Thursday evening, held on the roof of the Chase Hotel, included the Rev. R. J. Wilbur, J. H. Brod, director of safety City of St. Louis; Senator Gardiner and J. C. Hall, counsel Missouri Association of Public Utilities.

H. B. Cobban, general manager Northeast Oklahoma Railroad, was elected president for the ensuing year. F. G. Buffe was elected first vice-president, R. J. Lockwood second vice-president and J. A. Weimer was re-elected secretary-treasurer. The following executive committee was also selected: A. E. Reynolds, R. A. Leussler, H. W. Patten, B. Hilburn, B. W. Frauenthal, D. L. Fennell, J. L. Adams, R. B. Campbell.

President Reynolds reported the receipt of an invitation to hold the next meeting of the association in Hot Springs, Ark. Mr. Buffe also extended an invitation on the part of Kansas City to hold the next meeting there. The time and place were left in the hands of the executive committee.

Preservative Treatment of Pine Poles*

By E. E. Boehne

International Creosoting & Construction Company

USE of creosoted pine poles, according to government statistics, increased 500 per cent between 1920 and 1925. Five hundred thousand were installed in 1923. That number increased to 1,000,000 in 1924. This is particularly significant because it was the only species of pole the use of which materially increased during that period. Obviously a definite swing of the industry is represented here.

A pole's worth is measured by the length of time it gives satisfactory life in the line. What shortens that life in the great majority of cases is decay. Decay, then, and its prevention are prime points for consideration.

Decay in wood is caused by low forms of plants called fungi, and by bacteria. Through the secretion of little understood chemicals, they dissolve the wood fiber, and its substance serves as food for the fungus. The science of timber preservation consists in poisoning that food, the wood. Creosote is the poison. The operation of injecting it deeply into the wood by pressure is the work of the modern wood preserving plant. There are other wood preservatives, but creosote is the best known.

The first step in the creosoting of pine poles, or, rather, a step preliminary to their treatment, is to season them; that is, to remove a sufficient amount of the moisture which all freshly cut wood contains to permit the entrance of the creosote. This is accomplished either by allowing the wood to dry on a seasoning yard or by steaming it in the treating cylinders.

Two processes have recognized standing and are in general use for pole treatment. They are the Bethel process, using 12 lb. of creosote per cubic foot of wood and leaving the wood cells full of creosote after treatment, and the Rueping process, retaining 8 lb. of creosote per cubic foot and leaving the wood cells partially empty after treatment.

In the Bethel process, after the material is placed in the cylinder, a vacuum of about 24 in. is maintained until the wood is as dry and free from air as practicable and then, without first breaking the vacuum, the cylinder is completely filled with the creosote oil. After the retort is filled, additional creosote is forced into the cylinder by means of pressure pumps, the pressure being gradually raised to and maintained at not less than 125 lb. per square inch at a temperature of 180 to 200 deg. F., until the required amount of the preservative has been forced into the wood. The pressure is then released, the oil drained from the cylinder and another vacuum drawn. The object of this final vacuum is to remove the surplus creosote from the surface of the timber, thus making the wood drier on the surface and cleaner to handle.

In the Rueping process, as the first step, air is pumped into the cylinder and thus into the wood under high pressure; then while this air pressure

Correct method of stacking poles in seasoning yard. Uniform spacing, wide alleyways between stacks and creosoted separating strips between each layer of poles provide thorough, even air seasoning

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*Abstract of a paper presented before the Missouri Association of Public Utilities, Cape Girardeau, Mo., May 6, 1927.

	New York			Youngstown			Montreal		
	1924	1925	1926	1924	1926	1926	1924	1925	1926
Depreciation per cent of capital account.	13	21	13	25	25	25	....	20	20
Depreciation, cents per mile...........	2.18	3.91	2.93	4.22	3.93	2.83	....	4.94	5.09
Equivalent in Canada, cents per mile....	3.05	5.47	4.10	5.90	5.50	3.96	....	4.94	5.09

governed by many factors such as quality and design of vehicle, nature of service performed, mileage performed per year, nature of routes and pavement, efficiency of maintenance and competence of drivers. Operation over rough roads and cobblestone pavement will cause premature body destruction. Heavy standee overloads will cause quick deterioration and failure of chassis and running gear. Incompetent drivers may wreck the engine and running gear while body and chassis remain in excellent condition. Inefficient maintenance methods will quickly result in wreckage of all the parts.

Owing to limited experience in bus operation, it has, so far, been the general practice to apply a flat average rate of depreciation to the vehicle as a whole. Further experience may guide us to the more rational practice of applying different rates to the various main members of a bus. This discussion does not permit of lengthy reference to the many methods that are used for the setting up of depreciation reserve funds. It is sufficient to say that the ultimate end of all these is the same, viz., that by setting aside each year, out of earnings, a sum proportionate to the depreciation in capital value of the equipment, a fund is established for the purchase of new equipment when, through usage or obsolescence or inadequacy or a combination of all these factors, renewals become necessary.

It is generally considered inadvisable that such a fund should be carried as an inert bank deposit. It may be reinvested or drawn upon for other purposes, provided always that it shall continue to earn and be credited with the normal rate of interest and be available for its legitimate use when required.

Owing to the difficulty of differentiating sharply between repair and replacement costs, it is common and perfectly sound practice to combine these costs and to set aside, each year, or when most convenient, specific sums to take care of both. The danger attendant upon this practice is that the setting aside of a sufficient sum to liquidate both liabilities becomes a matter of expediency and, unless the business is very profitable, there is a tendency to set aside an amount which fully covers the actual expense of making repairs but which does not leave a credit balance in proportion to the accrued depreciation.

When there is a clean-cut division made between these two accounts, there is the constant likelihood of minor renewals being made at the expense of the repairs account. These should normally be financed by withdrawals from the depreciation reserve account. Otherwise, this practice will obviously result in an undue inflation of the latter account and the balance sheet will not be a true statement of the financial status of the undertaking.

Furthermore, if a separate account covering interest on equipment is set up, it is obvious that since the depreciation reserve account is earning interest on the depreciated capital value of the equipment, revenue account should only be charged with interest at normal rate on the remaining capital value of the same equipment. In other words, if the income account is being debited yearly with a sum sufficient to cover accrued depreciation, without regard to interest, during the life of the equipment, the credits to interest account should be based on the average value, or one-half of the cost of the equipment. The same end is attained if interest on investment is carried at the full rate and the interests earned by the depreciation fund are credited back to income account.

Regardless of the method employed to attain that end, the principle to be followed is that funds be set up in some way to make necessary renewals of equipment when these are due without having to raise new capital to buy new equipment when the physical assets supporting the original investment have disappeared.

The question as to whether the rate to be applied against earnings to cover depreciation is to be based upon the element of time or upon usage is not of primary importance. If the factors of obsolescence and inadequacy can be ignored, which is seldom the case, there is no doubt that deterioration of physical and capital value will be in proportion to the usage or service rendered by the machine.

If we could anticipate the exact mileage that would be performed each year by a vehicle and could accurately estimate the mileage performance within the economical life of the vehicle, it would make little or no difference which method was adopted. However, since new buses are naturally called upon to do the heaviest part of the work and since the performance of the older buses becomes less and less as time goes on, the application of depreciation charges on a mileage basis has the advantage that the impairment of capital value is being absorbed each year in proportion to the earning ability of the bus. Furthermore, it is easier to estimate the probable ultimate mileage performance of the bus than to estimate the number of years that an old bus will continue to justify its existence in limited service.

Another factor in favor of the mileage basis is that a bus of normal grade and promise of normal life may, through some inherent deficiency, not be as popular as other types, and therefore, not be used to the same extent.

A rate based on a fair estimate of ultimate mileage performance will meet the variations in the usage factor with greater certainty.

Canadian bus operators cannot make direct comparisons of costs with those in the United States. Our fiscal policy dictates that we must pay 40 per cent more for our vehicles than our neighbors. This means that our interest and depreciation charges must also be 40 per cent higher.

The Fifth Avenue Coach Company of New York has had the largest experience of bus operators on this continent. Reference to its financial statements shows that the average proportion of depreciation charges to capital invested in equipment at the end of each year for the past three years is about 14½ per cent. This would indicate an applied rate of about 16 per cent of the average capital value of equipment during these three years.

A comparison of figures available relating to operation in New York, Youngstown and Montreal is of interest.

When comparing these figures it is to be noted that bus practice in New York has been fairly well standardized for several years and that Youngstown figures represent the performance of a fairly large proportion of older and less efficient buses.

Performance in Montreal, so far, indicates that a tapering down of depreciation charges from the existing 20 per cent basis will be quite in order and that a figure of about 4 cents per mile will cover the deterioration of the high-priced, larger vehicles as well as the cheaper and smaller vehicles, which may be expected to deteriorate at a faster rate.

Simplifying Car Inspection*

By J. E. Watkins

Superintendent of Rolling Stock,
Winnipeg Electric Company

PROPER inspection of cars is, as you are no doubt aware, most difficult to have repeatedly performed, as it becomes a routine. To facilitate matters, specific instructions ordinarily are issued, but this appears not to simplify the operation and only to make it more complicated. When the inspector performs his duty, everything should be noted during his passage through the car. A form, similar to the one reproduced, has been found by the Winnepeg Electric Company to be most advantageous, as in starting at the back of the car, beginning with the rear entrance step, he is able to note the defects by inserting a cross (X) opposite the particular one which is found. The safety points, whose condition must be maintained at all odds, are particularly drawn to his attention by black dots.

It has been acertained that better results are achieved by reducing to a minimum the amount of writing on the part of the inspector. This is the reason for inserting a cross only. The manner in which this form is compiled helps greatly in securing a good report.

It is considered by this company a safe and economic system to inspect on the following basis: 750 miles for mechanical defects, 1,500 miles for mechanical defects and lubrication. In

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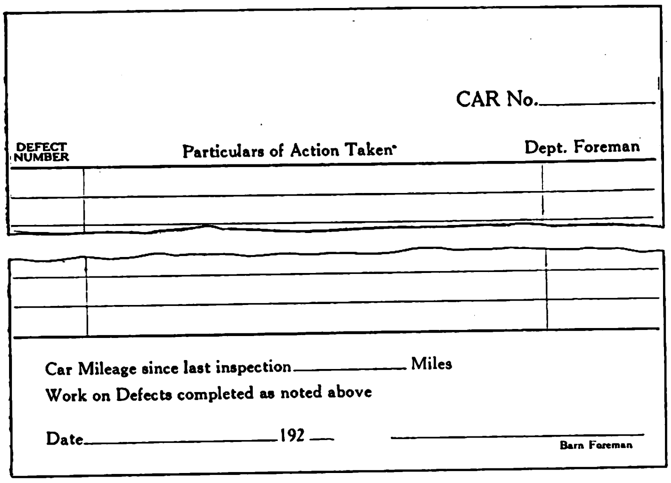
*Abstract of discussion before the Canadian Electric Railway Association, Winnipeg, May 31-June 2, 1927.



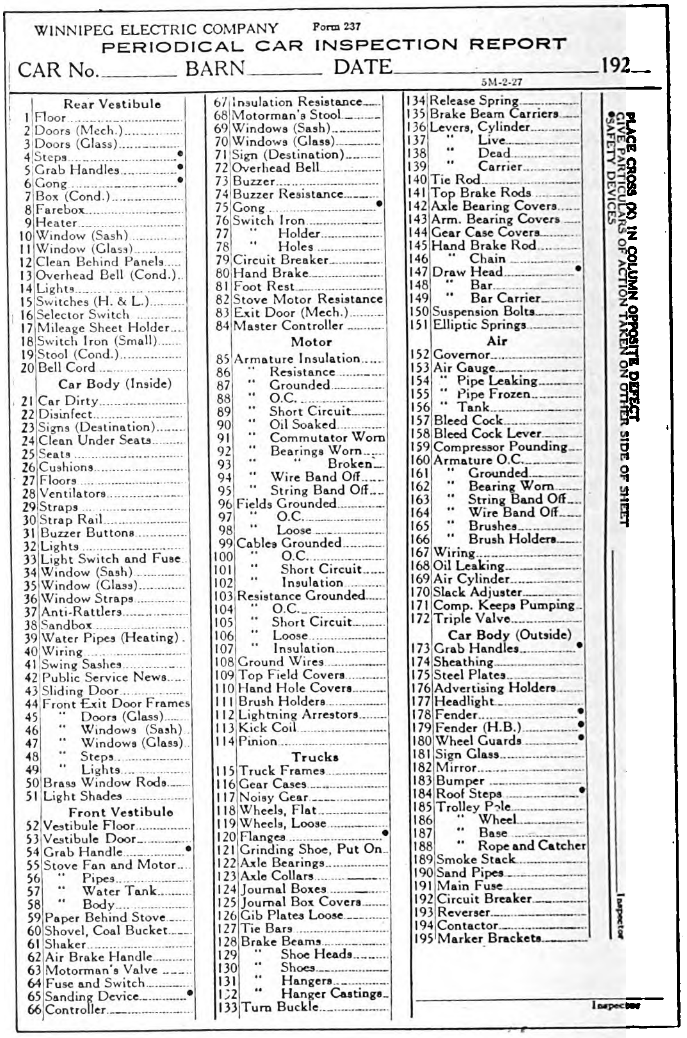
CAR No.______

DEFECT NUMBER	Particulars of Action Taken*	Dept. Foreman

Car Mileage since last inspection______ Miles

Work on Defects completed as noted above

Date______192__ ______ Barn Foreman



WINNIPEG ELECTRIC COMPANY Form 237

PERIODICAL CAR INSPECTION REPORT

CAR No.______ BARN______ DATE______192__

5M-2-27

Rear Vestibule

1 Floor
2 Doors (Mech.)
3 Doors (Glass)
4 Steps ●
5 Grab Handles ●
6 Gong ●
7 Box (Cond.)
8 Farebox
9 Heater
10 Window (Sash)
11 Window (Glass)
12 Clean Behind Panels
13 Overhead Bell (Cond.)
14 Lights
15 Switches (H. & L.)
16 Selector Switch
17 Mileage Sheet Holder
18 Switch Iron (Small)
19 Stool (Cond.)
20 Bell Cord

Car Body (Inside)

21 Car Dirty
22 Disinfect
23 Signs (Destination)
24 Clean Under Seats
25 Seats
26 Cushions
27 Floors
28 Ventilators
29 Straps
30 Strap Rail
31 Buzzer Buttons
32 Lights
33 Light Switch and Fuse
34 Window (Sash)
35 Window (Glass)
36 Window Straps
37 Anti-Rattlers
38 Sandbox
39 Water Pipes (Heating)
40 Wiring
41 Swing Sashes
42 Public Service News
43 Sliding Door
44 Front Exit Door Frames
45 " Doors (Glass)
46 " Windows (Sash)
47 " Windows (Glass)
48 " Steps
49 " Lights
50 Brass Window Rods
51 Light Shades

Front Vestibule

52 Vestibule Floor
53 Vestibule Door
54 Grab Handle ●
55 Stove Fan and Motor
56 " Pipes
57 " Water Tank
58 " Body
59 Paper Behind Stove
60 Shovel, Coal Bucket
61 Shaker
62 Air Brake Handle
63 Motorman's Valve
64 Fuse and Switch
65 Sanding Device ●
66 Controller
67 Insulation Resistance
68 Motorman's Stool
69 Windows (Sash)
70 Windows (Glass)
71 Sign (Destination)
72 Overhead Bell
73 Buzzer
74 Buzzer Resistance
75 Gong ●
76 Switch Iron
77 " Holder
78 " Holes
79 Circuit Breaker
80 Hand Brake
81 Foot Rest
82 Stove Motor Resistance
83 Exit Door (Mech.)
84 Master Controller

Motor

85 Armature Insulation
86 " Resistance
87 " Grounded
88 " O.C.
89 " Short Circuit
90 " Oil Soaked
91 " Commutator Worn
92 " Bearings Worn
93 " " Broken
94 " Wire Band Off
95 " String Band Off
96 Fields Grounded
97 " O.C.
98 " Loose
99 Cables Grounded
100 " O.C.
101 " Short Circuit
102 " Insulation
103 Resistance Grounded
104 " O.C.
105 " Short Circuit
106 " Loose
107 " Insulation
108 Ground Wires
109 Top Field Covers
110 Hand Hole Covers
111 Brush Holders
112 Lightning Arrestors
113 Kick Coil
114 Pinion

Trucks

115 Truck Frames
116 Gear Cases
117 Noisy Gear
118 Wheels, Flat
119 Wheels, Loose
120 Flanges ●
121 Grinding Shoe, Put On
122 Axle Bearings
123 Axle Collars
124 Journal Boxes
125 Journal Box Covers
126 Gib Plates Loose
127 Tie Bars
128 Brake Beams
129 " Shoe Heads
130 " Shoes
131 " Hangers
132 " Hanger Castings
133 Turn Buckle
134 Release Spring
135 Brake Beam Carriers
136 Levers, Cylinder
137 " Live
138 " Dead
139 " Carrier
140 Tie Rod
141 Top Brake Rods
142 Axle Bearing Covers
143 Arm. Bearing Covers
144 Gear Case Covers
145 Hand Brake Rod
146 " Chain
147 Draw Head ●
148 " Bar
149 " Bar Carrier
150 Suspension Bolts
151 Elliptic Springs

Air

152 Governor
153 Air Gauge
154 " Pipe Leaking
155 " Pipe Frozen
156 " Tank
157 Bleed Cock
158 Bleed Cock Lever
159 Compressor Pounding
160 Armature O.C.
161 " Grounded
162 " Bearing Worn
163 " String Band Off
164 " Wire Band Off
165 " Brushes
166 " Brush Holders
167 Wiring
168 Oil Leaking
169 Air Cylinder
170 Slack Adjuster
171 Comp. Keeps Pumping
172 Triple Valve

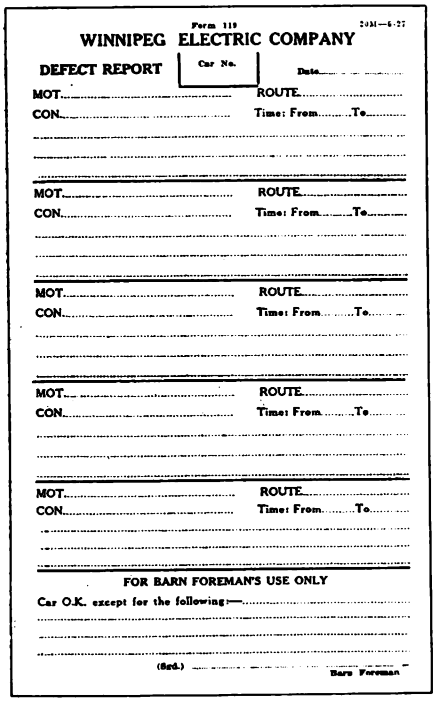
Car Body (Outside)

173 Grab Handles ●
174 Sheathing
175 Steel Plates
176 Advertising Holders
177 Headlight
178 Fender ●
179 Fender (H.B.) ●
180 Wheel Guards ●
181 Sign Glass
182 Mirror
183 Bumper
184 Roof Steps ●
185 Trolley Pole
186 " Wheel
187 " Base
188 " Rope and Catcher
189 Smoke Stack
190 Sand Pipes
191 Main Fuse
192 Circuit Breaker
193 Reverser
194 Contactor
195 Marker Brackets

PLACE CROSS (X) IN COLUMN OPPOSITE DEFECT
GIVE PARTICULARS OF ACTION TAKEN ON OTHER SIDE OF SHEET
●SAFETY DEVICES

______ Inspector

______ Inspector



Form 119 20M—6-27

WINNIPEG ELECTRIC COMPANY

DEFECT REPORT Car No. Date______

MOT.______ ROUTE______
CON.______ Time: From______To______

MOT.______ ROUTE______
CON.______ Time: From______To______

MOT.______ ROUTE______
CON.______ Time: From______To______

MOT.______ ROUTE______
CON.______ Time: From______To______

MOT.______ ROUTE______
CON.______ Time: From______To______

FOR BARN FOREMAN'S USE ONLY

Car O.K. except for the following:—______

(Sgd.) ______ Barn Foreman

Above and at right, car inspection form

Front and back of car inspection form used by the Winnipeg Electric Company. Each defect is noted by an X opposite the item. Action taken is shown on the reverse side.

At left, trainmen's form for reporting defects in Winnipeg

the case of trippers, once a week for mechanical defects and once a fortnight for lubrication.

The completed report, after inspection, is handed to the shop foreman, who, in turn, passes it to the department concerned. Should more than one department be affected, the sheet is passed on from one to the other or if convenient, all deal with it simultaneously. It is then returned to the head office of the department and retained for a reasonable length of time (usually two years) or unless circumstances occur which may require a longer period of retention.

Reports of defects which are made by the platform men are not always to be relied upon, especially where the defect slip is handed from one to another. They generally do not look for defects, but rely on what the previous operator has found and quote "same as above."

After noting most of the articles which have been written on this subject, it seems that for better efficiency and standardization, pull-in, defect and general inspection forms should be adopted by the Canadian Electric Railway Association and a monthly interchange system adopted, so that we could keep more closely in touch with each property on such matters.

Bus Men Hold First National Meeting

Progress in Organization, Interstate Regulation, Relations With Rail Carriers and Stabilization of Bus Industry Occupy Attention of Rail and Independent Bus Operators at Get-Together Meeting

REGULATION of the motor bus and progress in national organization plans occupied a front-line position in the program at the first annual meeting of the Bus Division of the American Automobile Association held in Philadelphia on June 15-17, coincident with the annual meeting of the parent association. Although operation of buses was given a place on the program, the matter of bringing about unity of action among various classes of bus operators through perfection of the Bus Division's organization, extension of its influence, and the immediate problem of securing a desirable national legislation for the regulation of interstate bus operation overshadowed entirely any operating or technical questions. Considerable attention was given to the relations between independent bus operation and existing steam and electric carriers.

Rail Men Participate

It was particularly noticeable that the question of relations between rail carriers and intrastate bus operations by the established holders of certificates of convenience and necessity gave rise to very little discussion and that a generous proportion of rail-bus operators were represented in the attendance, on the program and in the councils of the association. Operation of interstate buses, both in long-distance service and in such service as that radiating out of New York City, however, provoked considerable discussion and difference of opinion.

Progress in the organization work of the Bus Division was reported by the secretary and by the chairman of the division's board, A. M. Hill. He outlined the present situation as follows: "When the Motor Bus Division of the American Automobile Association came into existence, through an organization meeting in Washington on March 19, 1926, the initial membership included twelve state bus associations representing about 1,100 operators and 6,000 motor buses. Today, fifteen months after its organization, the Motor Bus Division is comprised of nineteen state and district associations representative of about 1,900 operators and 16,000 motor buses."

On the outlook for further growth in the near future Chairman Hill said: "The close of this calendar year should see at least 30 state and district associations, representing about 2,500 operators and from 18,000 to 20,000 buses, included in membership."

Organization plans of the Bus Division contemplate membership primarily by state bus associations, although individual operators are eligible to direct membership in the national association under the provisions of the by-laws. Present membership, according to the secretary's report presented at the meeting, is as follows:

State and District Associations—Michigan Motor Bus Association; Oregon Motor Stage Association; Motor Coach Association of Washington; West Virginia Motor Transportation Association; Pennsylvania Bus Association; Motor Carriers Association of California; Illinois Motor Transportation Association; Ohio Motor Bus Association; Motor Bus Association of Virginia; Carolinas Motor Carriers Association; Kentucky Bus Association; Arizona Motor Carriers Association; Southern Bus Owners Association, Inc.; Dakota Motor Carriers Association; Maryland Motor Transportation Association; Oklahoma Motor Truck and Bus Operators Association; Nebraska Bus Operators Association; Wisconsin Motor Coach Association; Minnesota Bus Association.

Individual Companies—Public Service Transportation Company of New Jersey; Florida Motor Lines, Inc.; Orange Belt Motor Line.

BUS REGULATION DISCUSSED

Principles for the establishment of bus regulation were laid down by various speakers. S. A. Markel, chairman of the legislative committee, outlined the history of the division's participation in the effort to work out national regulation for interstate operation. He said that the committee hopes to have its own bus bill, which has been introduced in the House of Representatives, passed at the next session of Congress. In drawing this bill, the important matter of the determination of convenience and necessity for a bus operation was based on the principle that the character of the service to be regulated, should be considered. Mr. Markel also reviewed the recent hearings on bus operation before the Interstate Commerce Commission. He said that the one purpose of the railroads seemed to be to show loss in revenue attributable to bus operation. He maintained, however, that the bus men had been able to prove from the evidence that railroad passenger loss was attributable in large measure to the effect of the private automobile, not the motor bus.

F. O. Sanders, supervisor of bus operation for West Virginia, explained the way in which even interstate operations have been controlled in that state by exercise of the state's police powers, particularly as regards public safety. He said that both bus operators and public officials are pretty well agreed on the need for regulation, the only difference of opinion being as to the extent and character. In West Virginia regulation is not limited to common carrier vehicles operating between fixed terminals, but is applied to all vehicles operated for compensation. He expressed the belief that regulation of common carriers only leaves the road open for irregular operators to destroy the business of those that are regulated.

Concerning the field of bus operation, J. A. Ritchie, president Omnibus Company of America, speaking both as an operator and as a manufacturer, said that operations by his company in New York, Chicago and St. Louis fall into the class of mass transportation. Since the question of the suitability of buses for mass transportation was considered by Mr. Ritchie to be a controversial one, and since the electric railways of the country are the largest existing and prospective operators of this class of service he considered it advisable to leave the final determination of the field of the bus in this class of service to the judgment and experience of these companies. Mr. Ritchie emphasized the importance of the relations between management and men in the successful operation of buses. He declared it exceedingly important that the men be made to feel themselves associates in the business of providing public transportation and that they be encouraged in thinking about the improvement of service by welcoming and stimulating their suggestions.

The principle that the states have a large interest in interstate regulation of buses was declared sound by E. W. Wakelee, vice-president Public Service Corporation of New Jersey. He maintained that in delegating authority to the states under federal legislation care should be taken that the state act under its own authority up to the limit of its powers and as a federal agent only beyond that point.

T. R. Dahl, vice-president the White Motor Company, commented on the constructive character of the discussions and upon the soundness of the principles that had been presented. The general note of accord in the meeting was interrupted by the objections of T. A. Keppler, representing bus operators running to various points out of New York City. He advocated direct federal regulation of interstate operations instead of the delegation of authority to the respective state commissions.

Quoting John Marshall to the effect that, "The power to tax is the power to destroy," R. W. Taggart, president of the nationwide "Yellowway" bus operations, declared that the contention that bus operation in general is not profitable is untrue. He said that many present operators had started with no capital and that their continued existence is in itself proof of the profits made.

Prepared addresses during the meeting were presented by A. J. Brosseau, president International Motor Company; F. J. Scarr, consultant; B. W. Arnold, assistant general manager Chicago, North Shore & Milwaukee Railroad; C. T. McConnell, vice-president Ohio Motor Bus Association; H. G. Wells, public utilities commissioner from Massachusetts, and H. R. Trumbower, professor of economics University of Wisconsin.

Concerning the question of regulation Mr. Brosseau said: "The troublesome question of regulation is as yet unsolved. I am not an authority on the subject, but permit me to point out some elements which I consider fundamental.

"One of the chief virtues of the bus is its mobility. It does not run on rails, but it can go wherever there is an improved road.

"It is not costly to stop, hence it can pick up passengers at any point.

"Rates per mile should not be uniform unless road and other conditions are comparable.

"Regulation should not be based on rail or bus practice of today.

"Elaborate systems, such as apply to rail lines, are not needed.

"Disregard all or part of these factors and you will retard bus development and so hamper it as to deny the public the benefit of its use."

An abstract of Mr. Brosseau's address, together with some of the others presented, will be published in future issues of ELECTRIC RAILWAY JOURNAL.

Correct Wear of Trolley Wire

IN THE report of the Canadian Electric Railway Association meeting, issue of June 11, page 1051, J. F. Neild of Toronto is quoted as saying that with a 25-lb. trolley wheel pressure, No. 00 hard-drawn copper wire should be good for 3,000,000 wheel passes. The figure should have been 2,000,000 wheel passes instead.

American Association News

Entertainment

THE first meeting of the 1927 convention entertainment committee of the American Electric Railway Association was held at the Ambassador Hotel in Atlantic City on June 8. Tentative plans for the various forms of entertainment were discussed, committees were suggested and general plans carried forward so that they may be investigated and reported upon finally at the next meeting of the entertainment committee, which will be held at Cleveland, probably on Monday, July 11.

Chairman Edwin C. Faber presided. Other committee members who were present were Fred Dell, Harry Doyle, J. D. Porter, J. H. Blackhall, John A. Dewhurst, J. R. Welsh, J. O. Kennedy, Fred Bullock representing J. H. Alexander, E. E. Bodin representing Claude Van Auken, S. J. Cotsworth and E. F. Wickwire.

Rolling Stock

FINAL reports of the various special committees on rolling stock were considered by the general committee at a meeting held at association headquarters in New York, June 7 and 8. Those present were A. T. Clark, chairman; W. S. Adams, V. W. Berry, C. Bethel, R. S. Bull, R. W. Cost, M. R. Hanna, J. S. McWhirter, A. D. McWhorter, F. W. Sargent, Hugh Savage, E. S. Sawtelle, D. F. Smith, C. W. Squier and H. S. Williams.

Special committee No. 1 on review of

Manual sections reported on a number of changes which the committee had agreed upon. These included changes in brakeshoe standards, coupler specifications, standard dimensions for height of platforms and bumpers of interurban cars, additional information to the tables of wheels, provision for bolting pads to wheels to reduce noise in operation, location of end connections on cars and additional information regarding installation of connectors used on motor leads.

A tentative report on motor coaches was submitted by special committee No. 2, which reviewed the work of the 1926 and previous reports and included additional information which has been developed in co-operation with the Motor Coach Division of the Standards Committee of the Society of Automotive Engineers and other agencies. An inspection system for gasoline electric motor coaches as used by one large operator was submitted.

In the tentative report of special committee No. 3 on car equipment attention was given to improved design as incorporated in the new Springfield and Joliet cars and to advances made in streamline painting.

The report of special committee No. 4 on lighting contained a review of the principal conclusions as presented in the 1926 report and included revisions and additions for a more comprehensive treatment of the subject. A section on recommended practice contained a discussion of suitable lamps and reflectors for car lighting, together with illustrations of typical lighting units, and plans showing proposed arrangement of outlets. A table showing comparative demand for standard street railway lamps during the years 1925 and 1926, together with a review of recent developments in lamps for electric railway service, was given in an appendix of the report.

Special committee No. 6 on lubrication presented a tabulation of answers to a questionnaire which had been sent out. The report will be revised and put in standard form.

A complete report was presented by special committee No. 7 on air compressors. This will be sent out for letter ballot to the members of the committee.

Special committee No. 8 on motor brushes reported on a program which had been previously outlined. This is being carried out and a progress report will be presented this year.

Particular interest was shown in the report of special committee No. 9 on noise reduction. A number of tests have been conducted on various equipment parts to show how different types of installation can reduce noise.

Special committee No. 10 on gearing presented a tentative report with certain recommended changes in existing specifications.

Special committee No. 12 on journal boxes reported that recommendations would be made for doing away with thrust plates and omitting the lugs for holding these in journal boxes.

Special committee No. 13 on limits of wear is making substantial progress toward recommending limits of wear that will reduce the spreading of gear centers.

Special Rolling Stock Committee No. 1

SEVERAL important decisions regarding changes to standards and specifications as they now exist in the Manual were decided upon at a meeting of special rolling stock committee No. 1, held at association headquarters, New York City, June 6, 1927. Those present at the meeting were C. W. Squier, chairman; W. S. Adams, H. S. Williams, members of the committee, together with representatives of coupler manufacturers, H. E. Van Dorn, John Keegan, D. C. Davis, A. E. Heffelfinger, A. L. Price and H. W. Gilbert.

The morning session of the committee was devoted to a discussion of couplers. Revisions to the recommended specifications, serial No. E 100-12, were decided upon. In reviewing the specifications various comments from manufacturers were received. Those present felt that a large amount of work should be done in collecting additional information and developing standards for couplers. To develop them properly a special committee was recommended to be appointed consisting of various manufacturing representatives as well as operators of interurban railways.

New designs of brakeshoes were decided upon by the committee. They give more space in the grooved section of the shoe which fits over the wheel flange. This was considered desirable to provide for worn wheels.

Standard dimensions for heights of platforms and bumpers of interurban cars were discussed by the committee and certain changes were agreed upon. Changes in the specifications and tables for wheels were also agreed upon. It was recommended that a note be added to the effect that the hub diameters given in the tables should be looked upon merely as maximum limits to take care of eccentric bores. Specifications should govern the inspection and acceptance of wheels. To provide for bolting of pads to wheels to reduce noise in operation, the committee recommended that four holes be added to the present wheel design.

A new drawing for the location of end connections was presented. This will be included in the committee's final report. The miscellaneous method in practice on motor leads was reviewed and the committee recommended that more definite information be given regarding approved practices for insulating motor lead connectors. Several other specifications, which are now included in the Manual, were gone over and suggested changes were considered, but as additional information was required to give proper study, no changes were decided upon.

Way and Structures

REPORTS of nine special committees were read at the third meeting of the committee on way and structures, held at association headquarters, New York City, June 9 and 10. Subjects covered included review of existing standards, track ballast and drainage, rails, arc welding, special alloy steels other than manganese, effect of rubber-tired vehicles on pavement, bus garages, light grooved girder rail and standardization of switch tongues. Members present were H. H. George, chairman; A. T. Spencer, C. A. Smith, C. A. Alden, H. F. Merker, W. G. Hulbert, W. W. Wysor and C. F. Gailor, chairman of the special committee on arc welding.

Education

ON JUNE 14 an all-day session of the committee on education of the American Electric Railway Association was held. The program for the annual report was decided on and the work at the coming convention was discussed. Following the foremen conference demonstration of last year it is planned this year to conduct a six-day school, four hours each morning of convention week from Monday until Saturday inclusive, at which delegates from companies may receive instruction as to how to conduct foremen conferences. It was tentatively planned to have this group led by H. H. Norris of the Boston Elevated and A. J. Sarrė of the New Orleans Public Service, Inc., calling on Frank Cushman as an adviser, critic and instructor. Mr. Cushman, of the Federal Board for Vocational Training, Washington, D. C., is well known for his educational work in industry, with particular relation to the conference method of foreman training. Both Professor Norris and Mr. Sarrė have used this method on their respective properties for years. The work will be conducted alternately by these two men, holding several conferences each morning. At the close of each Mr. Cushman will criticise and make suggestions based on his observations.

Further data and application forms will soon be sent to member companies in order to enroll applicants for this training work in advance of the convention. In order to obtain the best results the group will be limited probably to 50 members.

The committee's report was essentially completed. It will contain a review of the educational activities of the member companies that have responded to the questionnaire sent out by the committee earlier in the spring.

At the meeting H. H. Norris presided for Edward Dana. Other members present were J. F. Hyatt, A. J. Sarrė, A. B. Gibson, H. H. Fenton representing W. H. Boyce, John A. Dewhurst and J. W. Welsh.

Traffic Congestion

WITH a few minor alterations the preliminary draft of the report of the committee on traffic and safety was unanimously approved by the members present at a meeting held at association headquarters June 9. It was decided to send a message of appreciation to C. H. Evenson, chairman, for the work he did in preparing the report. Members present were A. J. Fink, F. L. Butler, R. W. Emerson, J. P. Ingle, Deane Locke, J. A. Miller, Jr., E. C. Spring and Samuel Riddle of the Transportation and Traffic Association and H. K. Bennett, Seth W. Baldwin and A. G. Jack of the Claims Association.

The News of the Industry

Little Progress in Toledo

Prospects Not Bright for Settlement of Franchise Matter Before 1928 —Terms of Grant Unknown

Hope for the passage of a new franchise in Toledo to amend and correct defects in the present Milner service-at-cost plan to be put into effect before the beginning of 1928 is rapidly passing.

Representatives of the Henry L. Doherty & Company interests, including Frank R. Coates, president of the Toledo Edison Company and the Community Traction Company, Toledo; Dewey C. Bailey, special counsel, and R. E. Burger, chief of the utility division of Cities Service Company, have been in several meetings with the members of the street railway board of control in Toledo recently, but an agreement has not yet been announced and no franchise will be ready for submission at the August primaries.

The local political situation and the mayoralty election preclude submission at a general election and so the present plans would seem to contemplate the working out of the details of a new arrangement to submit to the voters at a special election late in November or early December.

Definite announcement of the terms of the new ordinance are not available, but the tenor of the conferees indicates that the new grant will provide the company with an exclusive franchise for bus and railway service for a period of ten years. The board of control is being asked for concessions by way of the writing off of the accumulated deficit of more than $1,000,000 and bringing in of probably $1,500,000 of new capital without increasing the outstanding securities of the Community Traction Company.

Work has started on the repair of the St. Clair Street tracks in the downtown section, forced upon the company by the city administration so that new paving could be laid on that street. Abandonment of these tracks was provided in the original Riggs plan. This move is taken to indicate that complete solution of existing problems is still many months away.

The City Council has also passed an ordinance which will give to private bus lines a two-year operating privilege, a move which some contend may block the city from granting exclusive transit privileges for two years. However, this ordinance has not been signed by Mayor Fred J. Mery and is not enforceable for some time. Its enforcement will be in the hands of the city administration, which is in accord with the negotiations being carried forward by the railway board of control.

It will be recalled that the franchise settlement ordinance, which was prepared by Dewey C. Bailey and Law Director Frank M. Dotson and received the approval of Prof. Henry Riggs and Attorney Newton D. Baker, was rejected by the board of control and a business men's committee of the Chamber of Commerce. That measure is considered definitely out of the picture in the solution of problems.

The power purchase question, which has been particularly knotty under the Milner ordinance, is believed to be solved on the basis of Professor Riggs' plan, but it will be put into effect only in the event of the solution of other franchise problems.

New Tariff in Buffalo

Ten-Cent Cash Fare in Buffalo Depends Upon Carrying Out Program of Reconstruction—Rate Base on Which Company Is Allowed Return Fixed at $23,261,558

THE Public Service Commission authorized the International Railway to file a new tariff of fares in Buffalo, N. Y., to be effective July 1, 1927, fixing the adult fares at 10 cents cash, three tokens or tickets for 25 cents and 3 cents for children's fares, between the ages of five and twelve years. The order of the commission is contingent upon the agreement of the company to carry out diligently and in good faith a reconstruction program, beginning with the reconstruction of tracks and repavement of Grant, Seneca, East Ferry and Smith Streets and Fillmore Avenue, the estimated cost of which is $947,703.

On Sept. 15, 1926, the International Railway proposed to increase fares in Buffalo to 10 cents for adults and 5 cents for children, to be effective Oct. 16. The commission refused to accept the new tariff and instituted an exhaustive investigation into fares, revenues and operations of the railway, inasmuch as complaint had been filed by the city with the commission as to service, condition of equipment, operation of one-man cars and condition of the roadbed. The city and company both filed exceptions to the report of the commission's accountants and very little further testimony was taken, so the questions are decided substantially on the records of the commission brought down to recent date by the reports of the accounting and engineering divisions of the commission.

The rate base arrived at by the commission, applying to the city of Buffalo only, and upon which the company is entitled to a return for investment, is $23,261,558. The estimated revenues and operating expenses, including taxes, for 1925, and on which the present fare is based, would have left available for return on investment $1,850,061. The increased fares authorized at that time, however, failed to produce the revenue estimated, the actual return for 1925 being $1,664,497. Failure to earn the estimated revenue was due to the decrease of passengers, which had been anticipated, but not to the extent occurring. There was some decrease in operating expenses.

The commission estimates that the increased fares now allowed will produce a net return of $1,961,144, with which the company should be able to pay interest on its funded debt and other fixed charges against its income, and with the application of at least part of the annual accrual to its reserve for depreciation should carry out the reconstruction program outlined.

Commissioner Pooley, who conducted the investigation for the commission, says in his memorandum:

> The city of Buffalo is vitally interested in its street railway transportation. A large amount of track reconstruction and repaving appears to be necessary now and in the near future. The projects demanded by the city and now imperative involve an expenditure on the part of the company of upward of $2,500,000 without taking into consideration construction work demanded every year.

In his statement accompanying the report he said it was unfortunate that fares in Buffalo had to be again increased. The commission was desirous of lending its co-operation for the betterment of the transit situation in Buffalo, and to that end would, upon request of the city authorities, arrange and conduct conferences between the city and company officials. It might be that certain improvements or extensions are contemplated or desired by the city and that its authorities may wish to give other street improvements priority over some of the projects covered by the commission's program. There should, too, be a further program for reconstruction and repavement, and the subject matter of the various court actions now pending might be considered and further useless and costly litigation avoided. All of these and other matters might well be discussed at the above suggested conference, which will be arranged by the commission promptly on receipt of advice that the city authorities desire to co-operate.

Improvements Carried on Apace in Milwaukee

Chief current activities in the transportation branch of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., are addressed to improving car and bus service within the metropolitan area and to transforming the company's old interurban lines into rapid transit, de luxe lines. The Waukesha - Oconomowoc - Watertown line, thus transformed last year, is popular and successful. Rapid transit de luxe car service on the Burlington-East Troy lines will be opened early in the summer of 1927. On completion of this plan, Milwaukee Electric will give Milwaukee, for the first time in the city's history, swift and luxurious suburban passenger service southwest and west on its own lines, and north along the lake shore on the Milwaukee Northern—a service which will be a large factor in promoting outward industrial and residential growth of the Greater Milwaukee district.

Aurora & Elgin Increases Efficiency of Freight Service

By the adoption of improved methods, the Chicago, Aurora & Elgin Railroad has brought about faster handling of carload freight traffic, affording substantial economies in operation, including a reduction in per diem costs for foreign line cars on its rails. Based on the experience of the first month's working of the new plan an annual saving of approximately $30,000 is estimated by company officials. The change from former practice was made on Feb. 1 last, when a car service section of the transportation department was established at Wheaton, Ill., at the instance of Col. Edward J. Blair, general manager.

Since that time the average number of car-miles a day has increased some 29 per cent, compared with a similar period of 1926, resulting in a more expeditious movement of carload freight and permitting more efficient utilization of existing facilities. The ratio of empty freight car-miles to total freight car-miles has been lowered from 56 per cent to 33 per cent, incidentally reducing proportionately the operating cost of handling cars in non-revenue movement.

Rates Changed in Houston

Ten-Cent Cash Fare, Token Fare and Nickel Pass to Meet All Demands—More than $1,000,000 to Be Spent for Improvements in Year

ADJUSTED rates for the Houston Electric Company, Houston, Tex., effective June 13, call for 10-cent cash fares, tokens four for 30 cents and the weekly "nickel pass," introduced first at Fort Worth several months ago. The change in rates is from a 7-cent fare with 6¼-cent token rate and 3⅜-cent token fare for children. The new rate for children will be 4 cents.

Improvements during the next twelve months are to cost $1,000,000. These include the purchase of new cars and buses.

"Ride more for less per ride" is becoming the new sales slogan of the traffic superintendent. For the person who rides the street cars twice a day the average cost will be 6.79 cents per trip, just a little less than the present cash fare and slightly higher than the present tokens.

When shown to operators of the Houston Electric Company the holder of the "nickel pass" will be entitled to ride on all equipment, including the express buses, for the payment of a 5-cent fare. The passes will be issued weekly and will sell for 25 cents. Issued on Sundays, the passes will become valid the following day. If purchased any day after Sunday, the price is to decline at the rate of 3 cents per day. Thus the rider who does not purchase his pass until Wednesday pays only 19 cents for it and may ride cars or buses for an additional 5 cents per trip. When the pass is used three times a day or 21 times per week the cost per ride will drop to 6.19, or less than the tokens; for four rides a day the average cost will be 5.89 cents, and for five times a day, or 35 times a week, 5.71 cents.

Manager Jeff L. Alexander petitioned the City Council on Feb. 28 for an adjustment in rates as the Houston Electric Company was about to fulfil certain promises made in a "citizens' agreement" four years ago, when jitneys were abolished by ordinance. During the life of the agreement the company co-ordinated its railway and bus service and made other improvements, the total cost having reached $1,650,000. In suggesting a 10-cent cash fare with 8⅓-cent tokens and 35 cents for the "nickel pass," the company compromised for the new rates. Lowering the initial cost of the pass, it is believed, is likely to cause too great a reduction in car fares, though the plan will be thoroughly tested. Mr. Alexander and other officials of the company hail the new plan as one which will prove popular with the most frequent customers, through lowering their fares, and giving the mass riders during the rush hours a reasonable rate which will justify such improvements as are needed. It is only the infrequent rider who must pay the 10-cent cash fare.

Collect-on-Delivery Service in Indiana

A new collect-on-delivery service between all agency stations of the Union Traction Company of Indiana become effective on May 25 as a feature of the company's merchants' dispatch express freight service. Heretofore shipments have been accepted only on straight billing with no provision for collection on delivery. The service, for the present, will be confined to agency stations on the traction lines, 68 in number, including the Indianapolis station.

Rehabilitation of Ohio Property to Be Commemorated

The Cincinnati, Hamilton & Dayton Railway, Dayton, Ohio, plans a private inspection, dinner and celebration on June 22 to commemorate the rehabilitation of the property of the company. In general the program is as follows:

Inspection of a portion of the property, using for the first time the new interurban equipment now under construction.

Inspection of a typical new power substation.

Inspection of the new car shops and offices at Moraine City.

Dinner at 6:30 p.m. at the company's new offices and car shops, Moraine City, immediately south of the Frigidaire plant.

Public cremation of old cars—the passing of the old; the advent of the new.

Fireworks display in conjunction with new and novel airplane night flying by the flying section of Wright Field, Dayton.

There will be in attendance at this community celebration of the rebirth of one of Ohio's leading interurban railways a selected group of prominent citizens of the Miami Valley as well as people prominent in New York, Philadelphia, Chicago, Pittsburgh and elsewhere.

Ten Cents Ordered in Albany on July 1

Car fares in Albany, N. Y., and the Capitol District are to be increased from 7 to 10 cents on July 1, by order of the Public Service Commission issued on June 15. The increase is effective on all lines of the United Traction Company serving, besides Albany, the cities of Troy, Cohoes, Watervliet and Rensselaer and the Villages of Green Island, Menands and Waterford. Under one provision of the ruling, however, the company must sell tokens at the rate of thirteen for $1. Fare for children, however, is increased from 3 to 5 cents. Transfer privileges are to remain as under the present tariff.

The decision of the commission in granting the increase was written by William A. Prendergast, Republican chairman, with three other commissioners concurring. Commissioner Lunn of Schenectady, Democrat, dissented.

No decision has been made in the case of the Capitol District Transportation Company, operating buses over streets in the same cities and which filed application before the commission for a 10-cent fare. The commission pointed out that the traction case decision was not to be construed as having any bearing on the decision rendered in the case of the bus company, a subsidiary of the United Traction Company.

In addition to awarding the increase asked by the traction company, the majority opinion refused to grant segregation of the company's properties, for which attorneys for the city of Albany had contended long and bitterly at hearings before the commission.

Two points of importance over which Mr. Lunn disagreed with the other four commissioners in the traction company case were valuation and segregation. Mr. Lunn held the traction company in arriving at a valuation basis of its property on which fares were to be determined "disregarded all elements that entered into the determination of valuation except that of replacement costs."

The only evidence presented, he said, was that of present reproductive cost of its entire property undepreciated.

Segregation of the company's properties as a basis for determining the rate of fare that should prevail in each city separately was considered of vital importance in the proceedings.

Wages Still an Issue in Toledo

Deadlock over the wage issue in the new contract which representatives of the Community Traction Company, Toledo, Ohio, and the union has held back a settlement for nearly two weeks. Every other point has been adjusted. The company has offered the men $5 a day minimum wage with $120 a month guaranteed to all extra men, with the old hourly wage scales in effect and some concessions on the part of the men as to working conditions.

The men want an increase of 10 cents an hour over the present scale of 50 cents for the first nine months, 52 cents for the next three months and 55 cents after the first year of service.

There has been considerable talk of a formal arbitration, but this would throw all conditions of the contract into the issue.

The old contract expired on May 31, but any changes which may be included in the new contract will be retroactive.

Philadelphia Subway Bids Will Be Opened July 19

Bids for extending the South Broad Street subway of the city of Philadelphia were called for June 10 by Henry E. Ehlers, Director of the City Transit Department, in whose office they will be opened on July 19. Unofficial estimates place the cost at $20,000,000. The specifications call for a continuation of traffic throughout the subway construction. Laying of rails, installation of electrical equipment and repaving of South Broad Street are not included in the construction contract. The length of the extension, known as Contract No. 109, is 3,020 ft. Transit department engineers estimate that there are 372,000 cu.yd. of excavation, 54,000 cu.yd. of concrete, 11,700,000 lb. of structural steel, 1,400,000 lb. of reinforcing steel and about 1,200 tons of cast-iron pipe included in the contract.

Property Owners and City Confer on Chicago Subway Problems

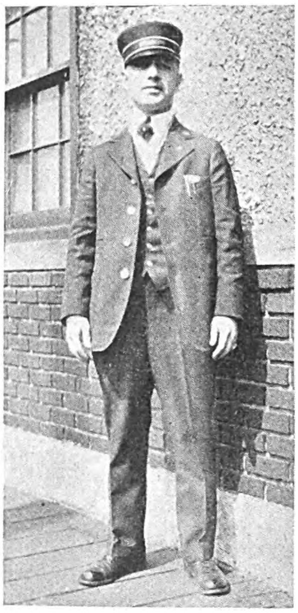
Downtown property owners and city officials of Chicago conferred for the first time a few days ago on the problem of subway construction. Addressing the meeting in behalf of the Lake Street Property Owners' Association and Wells Street District Property Owners' Association, H. L. Ressman, president of both organizations, offered renewed assurance to the city of their readiness to stand equitable special assessment for subways to be built wherever expert engineers should declare them most beneficial. In return for this support he asked that the city government pledge itself to remove the present sunlight-obscuring and noisy elevated structure from the Loop district as a part of the traction-subway program. The two associations represent approximately 80 per cent of the property owners on Lake Street and Wells Street in the downtown district.

While predicting the ultimate removal of the structure, Michael J. Faherty, president of the Local Board of Improvements, told the property owners that such a step would still be a bit premature and that they would have to consult with Samuel Insull, chairman of the Chicago Rapid Transit Company, which holds a 50-year franchise in the Loop, if they wanted the structure torn down.

With the co-operation of property owners thus assured, Mr. Faherty declared, the city would not be hindered by lawyers employed to attack the legality of spreading the cost of building the tubes between themselves and the city as a whole. The absence of legislation authorizing subway construction by special assessment, he added, is the only thing that is delaying the actual work. Traction bill No. 1, now awaiting action in the General Assembly at Springfield, is designed to give the city full authority in this matter.

Employees of South Shore Line Win Better Business Prizes

Cash awards totaling $300 have been received by twenty employees of all departments of the Chicago, South Shore & South Bend Railroad for their successful efforts in obtaining new business for the company during the first 60 days of the current year. The initial prize winners in the company's better business campaign, which was launched early in January, were picked from those showing the greatest efforts and results as represented in the number of revenue-producing tips turned in to the traffic department. During the first three months of this year 150 employees, or 25 per cent of all who are eligible, sent in one or more tips. The total number of tips received exceeded 1,280. Prizes totaling $300 will be awarded every 60 days throughout the year.



Charles Derrico, winner of $100 prize in South Shore's better-business campaign

Business gained through this campaign, according to the committee on awards, showed very favorable totals and as the campaign continues even greater results are anticipated.

Recapture of New York City Lines Discussed

James L. Quackenbush, general counsel for the Interborough, and former Gov. Nathan I. Miller, special counsel for the Brooklyn-Manhattan Transit Corporation, will be furnished with maps and other data showing in detail the tentative plan for a new city-owned subway system prepared by Col. William C. Lancaster, chief engineer of the State Transit Commission, and submitted at the transit readjustment hearing of the commission on June 10.

This tentative plan provides a system formed by a combination of the subways now under construction and contemplated, and the recapturable lines of the Interborough and B.-M.T. The series of maps presented by Col. Lancaster showed a subway system of 146 road miles which he said would form a complete system. He said it contemplated the recapture of all the B.-M.T. subways and the West End elevated extension, and the east side subway and the Interborough's Queens extension.

The plan contemplates an expenditure of $178,000,000 for recapture purposes—$52,728,000 for the desired portions of the B.-M. T. and $126,000,000 for the east side branch of the Interborough and its extensions to Queens.

Mr. Lancaster testified such a merger would produce a "very complete system," extending into all boroughs except Richmond.

While it was made plain that the commission has not in any sense approved this proposition as a whole, it became increasingly apparent that any plan is almost certain to include recapture of certain properties as a feature. The lines recaptured probably will be determined eventually by the attitude of the companies.

It was testified the B.-M.T., including equipment, has expended $49,232,000 on development of its subways, and that its deficit on its investment had been about $16,000,000, including its preferential of $3,500,000 a year. Including elevated extensions and third tracking, the whole investment under Contract No. 3 was brought up to $89,000,000. F. W. Lindars, accountant for the commission, said it would cost only $67,000,000 to recapture all those portions which can be taken back under the contract. The city's deficit on the B.-M.T.—loss of interest and sinking fund—Mr. Lindars figured at $47,000,000, bringing the total city investment in the road to $214,500,000.

The Interborough situation is different. The city's investment under Contracts 1, 2 and 3 totals $176,000,000, while the company, including cost of elevated extensions and third tracking, has chipped in $210,710,000. One curious thing brought out was that under the Interborough contracts the elevated extensions and third tracking are recapturable, but the road cannot be operated by the city.

Mr. Lancaster testified lines now being constructed by the city plus the portions proposed for recapture of both the private lines would provide a system with 146 road miles, leaving the Interborough with 71, and that the new system would be 27 miles longer than the combined systems, which would be left with only 119 miles between them.

"Carhouse" Cars Carry Passengers in Cincinnati

The unpopular "Barn Only" sign has been abandoned by the Cincinnati Street Railway, Cincinnati, Ohio, and plates lettered "Hyde Park Carhouse" or lettered for other carhouses have been substituted. This change has a psychological advantage. When a prospective car rider sees a "Barn Only" sign on the front of an approaching car he steps back, feeling that the car is out of service, when actually it will take passengers to any point up to the carhouse. With the new method, persons whose destinations are anterior to the carhouse will feel free to board those cars. The practice of using these cars has also been stimulated by notices through the press to the effect that carhouse cars will carry passengers at all times. An additional feature of these signs is that they are painted on the reverse side of the regular route number plates. All cars assigned trip numbers from a given carhouse will return to that carhouse at the end of the run. By this system one more sign is eliminated from the front of cars.

Mitten Building Replaces Equitable Building in Philadelphia

Mitten Management has purchased the Equitable Building, at the northwest corner of Broad and Locust Streets, Philadelphia, Pa. The total cost of the building was approximately $6,000,000, of which $4,300,000 is well placed on mortgage at a low rate of interest.

The Equitable Building will, in the future, be known as Mitten Building, and in addition to housing all of the Philadelphia Rapid Transit Company's office activities will also house the industrial section of the B. of L. E.-Mitten Bank, of which the principal office is at Market Street and West City Hall Square. Mitten Bank Securities Corporation will also have its headquarters in this building, at which point its executive vice-president, W. K. Myers, will be located, as also will the general offices of Mitten Management. Inc.

Another Piedmont & Northern Hearing June 20

Permission to intervene and become a party to the proceedings of the Interstate Commerce Commission in the matter of the application of the Piedmont & Northern Railway for a certificate of convenience and necessity to complete the proposed extensions of the lines in North Carolina and South Carolina has been asked by Gov. John C. Richards, the South Carolina Railroad Commission and Attorney-General John M. Daniel. They feel the establishment of the additional service is required by public necessity.

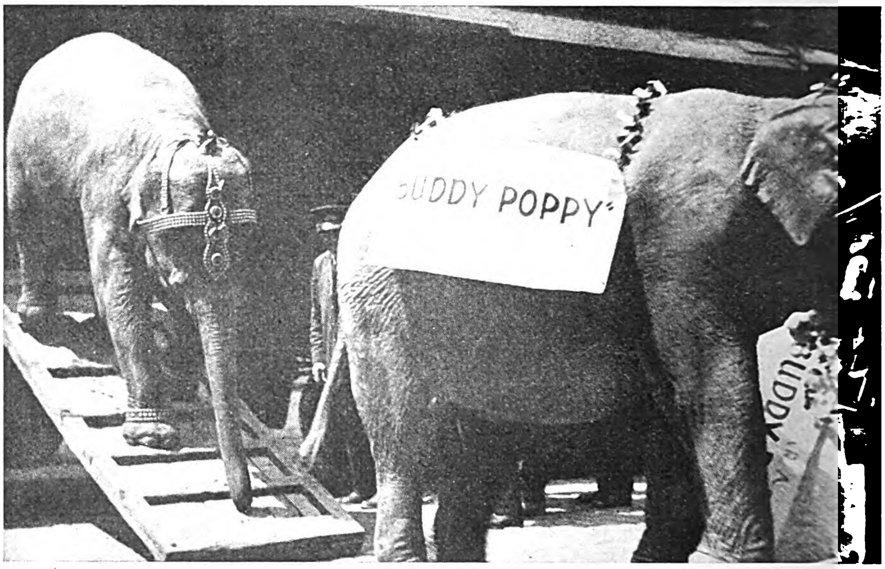
The Interstate Commerce Commission has ruled that it had jurisdiction over the Piedmont & Northern line and the petition for permission to construct the extensions now is in the hands of the commission.

The Southern Railway and the Seaboard Air Line Railway are opposing the construction of the new line. The lines proposed from Spartanburg to Gastonia and from Charlotte to Winston-Salem parallel the Southern Railway most of the way.

The question of the authority of the Interstate Commerce Commission over the Piedmont & Northern will be one of the matters to be heard on June 20.

A New Wrinkle! In Fact, Several of Them!

Ever alert to opportunities for civic help, the Pittsburgh Railways, Pittsburgh, Pa., received quite a bit of publicity during the latter part of May when the company hauled three young but husky elephants from their apartment at Kennywood Park (Pittsburgh's largest amusement park, about 10 miles from the city) down to the business section of Pittsburgh, where they were put through various stunts by their trainers in front of the railway company's office building.



Parade of pachyderms at Pittsburgh promotes purchase of poppies

The occasion was "Poppy Day," held throughout the Pittsburgh district by the Veterans of Foreign Wars. In order to stimulate the sale of poppies and to advertise the park, the Kennywood management offered the elephants for display on Saturday morning.

The railway helped out by furnishing a freight car for free transportation between the park and the city.

Additional Authority for Dr. H. E. Fisher

Standardization of employee medical service on the four electrically operated railroads in the Chicago district under the management of Samuel Insull and associates was announced with the recent appointment of Dr. Hart E. Fisher as chief surgeon of the Chicago, Aurora & Elgin Railroad and Chicago, South Shore & South Bend Railroad. Dr. Fisher has been in charge of the medical department of the Chicago Rapid Transit Company, Chicago, North Shore & Milwaukee Railroad and Public Service Company of Northern Illinois for several years.

Zero Hour a Success

Trainmen of the Georgia Power Company, Atlanta, Ga., have completed a series of eighteen "zero hours" over a period of as many days without an accident. With 400 street cars and 1,200 trainmen employed, only one accident was reported, and that was an automobile accident not affecting the street car. The drive started on May 9, when "zero hour" was set at from 6 until 7 o'clock in the morning. Thereafter "zero hour" moved up one hour each day until the conclusion of the safety campaign on May 26, when it came from 11 to 12 o'clock in the evening. Each day notices were posted at every carhouse giving the time of "zero hour." Similar notices were posted in all of the cars of the company, so that every employee knew when the hour came each day. The city safety council and other agencies co-operated in informing the public on "zero hours."

No Lower Fare for Boston & Worcester Railway

The State Department of Public Utilities of Massachusetts has dismissed the petition of the patrons of the Boston & Worcester Street Railway for a lower fare. The road is now selling zone tickets allowing 66 rides for $2.50, and the department suggests that the receiver for the company might well issue tickets for 26 rides for $1 to obviate the necessity of patrons tying up a large amount in tickets, but declined to order him to do so. In the order, the department states:

> It appears that the railway, since the receivership, has been operating at a deficit and that the increases in fares were made in the hope of cutting down the deficit. A receiver is ordinarily appointed to the interest of creditors. He is an officer of the court and his acts are subject to the control of the court. We are of the opinion that we have jurisdiction to order reduction in rates established by a receiver where they are manifestly unreasonable. It ought, however, to be a very plain case to justify such action on our part. Such is not the situation in the fares complained of.
>
> We think the receiver might well consider the advisability of issuing tickets good for 26 rides for $1.

New York Mayors Discuss Paving, Bus Regulation, Traffic Control

The New York Electric Railway Association through its secretary, William F. Stanton, asked the New York State Conference of Mayors at its eighteenth annual gathering in Niagara Falls to appoint a special committee to meet with a similar committee from the association in an effort to come to an understanding over paving between tracks. As a result it has been agreed to meet representatives of the railways at some future time and discuss the form legislation should take. Mayor Samuel A. Carlson, Jamestown, president of the conference, will hear any suggestions the railways may advance in respect to changes in the law and later in the year a special committee will be appointed to discuss the problem in greater detail.

William P. Capes, secretary of the conference, indicated that no concessions would be made which would be to the disadvantage of the cities or the taxpayers. The railways are seeking a change in the law which would obligate them to repave only those portions which, it could be proved, have broken down under railway traffic.

Motor bus regulation presented another topic for discussion at the Niagara Falls conference. Mayor Carlson said state laws are inadequate and that lack of governing power is producing a very unsatisfactory situation. The association went on record in favor of instituting a study of bus regulation in co-operation with the New York State Public Service Commission and the New York Electric Railway Association. Another recommendation was enactment of an amendment to the general highway law to provide uniform traffic regulations by control signals.

Mayor Walker of New York urged the Mayors to support the $300,000,000 debt limit extension for credit for subway building in New York City by encouraging the voters of their cities to cast their ballots in favor of the debt limit amendment. According to Mayor Walker the purpose of the amendment is to provide that whatever sum, up to $300,000,000, the New York City authorities decide to expend for the construction of new subways shall not be included in calculating the debt limit of the city. In other words, it provides that the credit of the city of New York, in the development of its transit facilities, shall be extended in the sum of $300,000,000.

San Francisco Extensions Fail to Carry

San Francisco voters at a special bond election on June 14 refused to approve two municipal ownership measures. The proposals were to buy the privately owned Spring Valley Water system for $40,000,000 and to spend $4,700,000 for municipal railway extensions. They failed to receive the necessary two-thirds vote. Friends of the two measures blame the light vote for their defeat. Out of a total registration of 225,000 only 73,117 went to the polls. The vote recorded on the railway bond issue was 44,305 yes votes and 28,888 no votes. The proposal to build the Bernal cut carried. This is a surface tunnel in the Mission district, linking that district with the new Excelsior district, now served by the Market Street Railway. Use of this cut is desired by the Municipal Railway.

New Texas Road to Open

Passenger service over the new Houston North Shore Railway between Houston and Goose Creek, Tex., is announced to begin on June 19. The line is 32.5 miles long and penetrates territory hitherto without rail facilities. Control of the road is understood now to lodge with the Missouri Pacific Railroad. Power for operation will be supplied by the Houston Electric Company.

Owen D. Young Heads Delegation to Stockholm

Owen D. Young, chairman of the board of the General Electric Company, will be the chairman of the American delegation to the Stockholm meeting of the International Chamber of Commerce, June 27 to July 2, it was announced recently by the American section. The American delegation will be made up of more than 150 leading business executives, representing different lines of industry, finance and commerce.

The conference will be in session six days, during which time the delegates will endeavor to work out a solution of some of the problems which are retarding the development of international commerce. For the purpose of technical discussion, the meeting will be split into four groups: Finance, Trade Barriers, Industry and Trade, and Transportation and Communications. The American participation in each group will be under the general direction of a committee of the American delegation.

Sightseeing in Portland.—A recent number of *Watts Watts*, the house organ which the Portland Electric Power Company, Portland, Ore., distributes through pockets on the street cars, is a tourist number containing information on places to go in the vicinity reached by the street cars. This company runs two sightseeing cars each day during the summer, touching all interesting points in the city. The fare is 50 cents and the trip consumes about 1½ hours.

Municipal Control Sought.—Bakersfield, Cal., may join the ranks of cities having municipal control over transportation system, if plans of the Bakersfield Realty Board are carried out. Action was taken recently at a meeting in a move to have the city take over control of the Bakersfield & Kern Electric Railway. Sentiment in favor of the municipal control idea followed the failure by the Realty Board to induce the railroad to extend its line into the southern part of the city, territory the railway considered unprofitable.

Verdict Won by Traction Company.—An award of $400 was made to the Morris County Traction Company, Morristown, N. J., on June 7 in its suit against the Dispatch Motor Express Company of Newark. The suit resulted from an accident in Main Street, Rockaway, when a truck of the Dispatch Motor Express Company crashed into a trolley car. This is the third verdict recovered by the Morris County Traction Company during this term of court, two verdicts for damages to its equipment by autos having been secured previously. In addition to these verdicts the company has collected damages in seventeen cases where the cars and autos were in collision during the first six months of 1927. The judge remarked to the jury in the last case that a railway should receive the same consideration in a case as if an individual were suing the company.

Seeks Fare Increase.—The Central California Traction Company has applied to the Railroad Commission for permission to increase its local fare in the city of Sacramento, Cal., from 5 cents to 7 cents per passenger.

Northwestern University Gives Summer Public Utility Courses. — The Northwestern University School of Commerce, in Chicago, announces that it will, as heretofore, offer two courses of instruction in public utilities during the summer session of 1927. These courses will afford an opportunity for a full program of work for those interested. The course in principles of public utilities will be offered by Prof. James P. Adams of Brown University and the graduate seminar will be under the direction of Prof. H. B. Dorau. Northwestern University School of Commerce during the regular school year offers a large number of courses, both graduate and undergraduate, dealing with every aspect of the public service industries.

Reduced Tickets for Sale. — The Springfield Street Railway, Springfield, Mass., placed in operation on June 5 a reduced rate round-trip ticket selling for 30 cents between Springfield and Riverside Park, good on the cars and buses to and from the park. However, no transfers are issued or accepted on the buses. The tickets are effective up to and including Sept. 10. Tickets will be sold by conductors and operators only on the cars or buses.

Theater Makes Refund.—For the week of June 6 patrons of the Nashville Railway & Light Company, Nashville, Tenn., were offered free rides by the Capitol Theater management. Introducing this offer a few weeks before, the theater gave round-trip carfare to hundreds of persons who visited the playhouse. All the patrons had to do was to present a coupon to the box office of the Capitol Theater when the theater tickets were bought and the 14-cent refunds were made.

Ten Cents Until 1931.—The Public Service Commission on June 9 granted the application of the Plattsburg Traction Company, extending the time to May 29, 1931, during which the company is authorized to charge 10 cents for the transportation of passengers within the city of Plattsburg, N. Y. On May 29, 1926, the Common Council of the city of Plattsburg authorized the company to charge a 10-cent fare for a period of five years. Application was made to the commission for approval of this fare and the commission granted such approval to remain in effect until June 4, 1927. The company then asked for a further extension in accordance with the action of the city officials. The commission was satisfied that such fare was just and reasonable.

Special Rates in Oregon.—The Oregon Electric Railway has been making special rates for the military tournaments and commencement festivities at the colleges and universities along its Willamette Valley line, in Oregon. Round-trip tickets were sold at the rate of about $3.70 for 100 miles, between Portland and way points.

Changes Awaited in Birmingham.—Railway rerouting and other traffic changes recommended by Ross W. Harris, following a traffic survey of Birmingham, Ala., will probably go into effect on June 26. J. S. Pevear, vice-president and general manager of the Birmingham Electric Company, said the company expects to have the track changes completed and to be ready to put the rerouting into effect on that day. Work of making the track changes will cost approximately $100,000. The Alabama Public Service Commission held that the City Commission had ample authority under the police powers of the city to require the rerouting as recommended in the survey. That body dismissed a petition of the company for right to make the changes on the ground that there was no question of service involved and that the commission was without jurisdiction.

Discourages Railway Resumption.—With the transportation problem in Columbia, S. C., rapidly becoming more aggravated, members of the Columbia City Council have asked R. L. Peterman, vice-president of the Broad River Power Company, which formerly operated cars in Columbia, about the possibility of resuming railway service. In reply to a question from the Mayor of Columbia, Mr. Peterman said he saw "no hope at all" for the resumption of service. He expressed the belief that railway service could not be made to pay and that street cars as a mode of public transportation were gradually being abandoned. Mr. Peterman, however, said he would take the matter up with higher officials of his company.

Opposes Fare Rise.—Declaring that the "time is inopportune" for the Georgia Public Service Commission to approve an increase in the Atlanta, Ga., fares, the Brookhaven Chamber of Commerce, the Morningside City League and the citizens of Oakland City—all suburbs served by the Atlanta system—have filed protests with the commission against the proposal of the Georgia Power Company to increase fares. July 12 has been set as the date for hearing. Several days ago the Georgia Power Company filed a petition with the Georgia Public Service Commission asking permission to increase present cash fares in Atlanta from 7 cents to 10 cents, as well as to increase price of tickets from three for 20 cents to three for 25 cents. It was alleged by the company that the railway division, instead of earning the 8 per cent on its investment authorized by the commission, was failing to reach this figure by approximately $1,000,000.

Recent Bus Developments

Interurban in Michigan Secures Operating Rights

Will Start Six Buses to Compete with Present Services to Michigan Shore Resorts

The Michigan Public Utilities Commission announced in an order issued on June 15 its decision authorizing the Grand Rapids, Grand Haven & Muskegon Railway to operate buses in conjunction with the company's electric cars between Grand Rapids and Muskegon and Grand Rapids and Grand Haven. For more than a year the officials of the company have sought to secure this right against the pooled interests of individual or syndicated bus lines that parallel the railway. President S. L. Vaughan, announces that buses will start the service on July 1.

The awarding of the franchise establishes a precedent in Michigan in that the territory involved now is served by another bus line. It was the last official act of the commission before two of its members retired to make way for two new members appointed to the body by Governor Green. Commissioners Odell, Duff and Doyle signed the order. Commissioner Pepper refused his signature. Commissioner Handy was absent from the board, having resigned on June 11.

The three commissioners said they acted after representatives of the bondholders testified the road would be abandoned unless bus service was permitted. Their order was an attempt to prevent the railway from going the way of the Grand Rapids, Holland & Chicago Company, recently defunct.

Officials of the interurban met on June 15, arranged a tentative schedule for the new buses and announced an hourly service both ways after 9 a.m. The electric cars will be operated morning, noon and night to accommodate persons who reside in nearby cities and work in Grand Rapids. Limited trains will continue to connect with the boats from Grand Haven and Muskegon to Milwaukee and Chicago. Freight car service will not be affected by the bus service.

To help popularize the bus service, hand baggage will be carried on the buses, while trunks, sample cases and other luggage too large for the buses will be transported in a combination freight and passenger car run on the interurban at noon.

The company will start its new service with six buses of the latest type, painted tangerine and trimmed in black to correspond with the interurban cars. They will be known as the Lake Line Motor Coaches.

Two sets of terminals will be established in Grand Rapids and Muskegon and in Fruitport and Grand Haven under this double interurban and bus plan, with the bus line junction at the present interurban station at Spring Lake. The line running from Fruitport and hugging the shore of Spring Lake to the village of Spring Lake and thence to Grand Haven will service many small resorts and open up a route hitherto without public transportation accommodations.

Mr. Vaughan says his company plans to charter buses to be run to any part of the state. After July 1 through buses will be run from Grand Rapids to Grand Haven to serve vacationists at the various resorts.

Mr. Vaughan hopes the new service will permit his company, now in receivership, to be brought back to a paying basis. Revenues taken from the railway by the competing bus lines are large during the summer tourist season.

I.C.C. Working on Bus Report

The Interstate Commerce Commission expects to complete its report on the operation of buses and motor trucks by, or in connection or competition with, common carriers subject to the interstate commerce act in time to submit it to Congress at the opening of the regular session. John J. Esch, chairman of the commission, so stated orally on June 11.

The investigation was ordered by the commission on its own motion on May 21, 1926. The scope of the investigation includes "the legality and propriety of the arrangements under which buses and trucks are operated; the rates, fares and charges for such services, and the provisions for filing schedules thereof, and the extent to which the traffic and revenue of carriers subject to the act are affected by the operation of motor buses and trucks."

Bus Feeders to Be Installed by Chicago Surface Lines

The Chicago Surface Lines is about to enter the bus field. In anticipation of the development of a number of coach lines in the near future, a separate motor coach organization has been established and all bus operation and maintenance will be under the direction of Walter Becker, assistant superintendent of the utility department. Temporary headquarters will be at the carhouse at Grand and Leavitt Streets, which has been remodeled for this purpose. The management has recognized for some years the value of motor coaches as feeders to the street car service, but opposition presented by the Chicago Motor Coach Company delayed the matter before the Illinois Commerce Commission for some time.

Five buses for this purpose are now being manufactured by the Twin Coach Corporation, Kent, Ohio, and delivery is expected in the latter part of June. Following that they will be put into service on Diversey Avenue from Crawford Avenue to Laramie Avenue, a distance of 1½ miles. This is the new Fageol type of bus referred to previously in the ELECTRIC RAILWAY JOUR-

NAL. It will seat 40 passengers and will be painted Para red and cream, the new standard colors of surface lines cars. The new coaches are for one-man operation. The operators will wear a type of uniform different from that of the street car men. The color is tan-gray, the coats of the Norfolk type with breaches and puttees.

Notices have been posted at all carhouses so that present employees may apply for this service and, if possible, the new group of operators will be selected from the present force of trainmen.

The rate of fare will be 7 cents with free transfers to connecting lines, the same as on the street cars.

Another Bus Line for San Diego Railway

Lloyd's El Cajon stage line, operating buses between San Diego and El Cajon, by way of La Mesa, has been sold to the San Diego Electric Railway, San Diego, Cal. The price paid was not made public. The sale involves the franchise and the equipment, consisting of two modern buses. The actual transfer of the franchise and property will be made as soon as authorization is secured from the State Railroad Commission.

It is understood the railway will operate the bus line as an auxiliary to its railway from the eastern terminus of the electric line through La Mesa to El Cajon. The railway has two applications before the Railroad Commission at the present time, requesting permission to operate lines on the routes affected. They are from 56th Street, on El Cajon Avenue, to La Mesa, and also from 34th Street, on Imperial Avenue, to La Mesa, by way of Encanto.

Abandonment in Indiana Sought

The Evansville & Ohio Valley Railway, Evansville, Ind., recently asked the Indiana Public Service Commission for permission to abandon its interurban line between Evansville and Mount Vernon. In the petition the company declares it will provide for a number of passenger and freight vehicles sufficient to accommodate a volume of business equal to that which it now has.

Improved roads were blamed by the company for its inability to operate between the towns at a profit. In its petition the company points out that the Indiana State Highway now extends from the city limits of Evansville to the city limits of Mount Vernon, running almost parallel with the railway line; that the highway is now in the course of construction and is being paved the entire distance between the two cities. It sets forth that when the highway is completed it will be unable to operate between the two cities except at a great loss.

The petition promises no increase in the present rates for either passengers or freight. The present fare schedule is based on 3 cents a mile, with a minimum fare of 10 cents. The Mount Vernon line has been operated since 1905. The Evansville & Ohio Valley assumed control in 1918.

New Agreement in Miami

The bus contract between the city of Miami and the Miami Beach Railway, Miami, Fla., has been canceled by agreement between the City Commission and company officials. A new agreement takes its place. Under it the city is relieved of the payment of about $1,000,000, including the cost of the buses and equipment, and is further relieved of reimbursing the railway for an operating deficit covering a guarantee by the city to meet the actual cost of operating the buses. The operating deficit, as shown by the company's books, is $369,499, although the city held an audit would show it to be less.

The new agreement extends to July 16, 1954. If it should be canceled by the city or the courts, the old contract is reinstated and the city is obligated to pay the sums due the company as of present date only.

In the new agreement the city waives the annual rental now being received by the company for the use of its railway. This amount averages less than $5,000 a year until 1929, when it was subject to revision for succeeding years. On the other hand, the city is relieved of purchasing new cars as was required in the railway agreement.

The agreement provides that if the city fails reasonably to regulate the transportation business as a whole in such manner as to permit the company properly to protect its revenues, investments and present operations, the agreement is canceled automatically. Both city and company officials declared that the new agreement would not affect the status or operation of other bus companies.

J. H. Gill, vice-president and general manager of the Florida Power & Light Company, indicated that public policy had a bearing on the company's decision to waive its claims. He said:

> The Florida Power & Light Company has investments in Florida totaling approximately $121,000,000, the safety of which, in the final analysis, is dependent upon the public and the public's attitude toward the company. With respect to this bus contract the company feels that it can better afford to waive $1,000,000 than to have the public assume that the company is being unduly benefited under any contract. The Florida Power & Light Company is and has been willing at all times to bring its problems before the court of public opinion in the belief that it will receive a fair answer from the people.

Meanwhile the final hearing of the jitney bus drivers' petition for an injunction to prevent the city from enforcing an ordinance that would keep them out of the business district of the city had been continued until June 10 to enable attorneys for the Miami Beach Railway, recently named codefendant in the action, to prepare their case.

Details of Regulation Discussed by Nebraska Commission

Thirty-five operators of intertown bus lines were represented in conference with the State Railway Commission on June 8 at Lincoln, Neb., to discuss future regulation and supervision of the business, to be taken over by the commission by virtue of a law that becomes effective on July 24. The conference developed that most of the companies wrote off their buses in four years, while one does it in three years.

The new law does not authorize the commission to fix rates or to issue certificates of convenience or necessity, but it does authorize the state body to supervise schedules and to prohibit any being used that are not approved.

The matter of insurance was warmly debated. The commission desires to increase the amount for the death or injury of one person from $5,000 to $7,000, with a total coverage of $30,000 for one accident. Another meeting will be held with insurance agents as advisers. They were not prepared to say that the new rules would decrease hazards sufficiently to influence rates downward. Another matter considered is a uniform system of accounts.

Violation of Operating Agreement Charged

The California Railroad Commission has directed the Western Motor Transport Company to cease immediately the transportation of passengers between North Vallejo and King, Napa, Flosda, Napa Junction, Sacramento Junction, Soscal and Napa Hospital in California following the filing of a complaint by the San Francisco, Napa & Calistoga Railway, which alleges that the bus company was carrying local passengers in violation of the terms of its operative rights granted by the commission. The defendant company was directed to cancel all rates applicable to such illegal service and through its successor in interest, the Dunham Stage Lines, to cease the transportation of passengers between Napa and King and between Napa and North Vallejo and to cancel its rates now on file for such service conducted jointly with the California Transit Company.

Buses Operating Over Former Railway Route.—Bus service was started by the Worcester Consolidated Street Railway, Worcester, Mass., on the recently abandoned railway route between Worcester and Webster, Mass., on June 1. It is planned to operate buses on express schedule to the Auburn and Oxford town lines. Transfers will be issued to passengers for use on all railway and bus lines of the company at connecting points.

Buses Succeed Cars.—An order was issued by the Illinois Commerce Commission granting the Tri-City Railway permission to remove its tracks and suspend service on the Stephens Park line, Moline, Ill. At the same time a certificate of convenience and necessity was granted to operate buses over the route from Fourth Avenue and Thirteenth Street to 37th Avenue and Seventh Street, Moline.

Pittsburgh Via the Gray Line.—A ten-page conveniently folded booklet has been issued by the Pittsburgh Motor Coach Company, subsidiary of the Pittsburgh Railways, Pittsburgh, Pa., intended to induce its patrons to see the steel and electrical city by means of the Gray Line, under which trade name the company operates. There are tours daily and on Sundays and holidays. They cover all points of interest in the city and suburbs.

Financial and Corporate

Costs of Connecticut Company Increase

An improvement over 1925 was the result of operations by the New York, New Haven & Hartford Company in 1926. This was the comment of E. J. Pearson, president, in the 55th statement of the affairs of the company addressed to the stockholders. The volume of freight traffic was the heaviest in the history of the company.

The net income of the Connecticut Company, one of the largest subsidiaries, shows a decrease in 1926 compared with 1925. Operating revenues increased principally from bus operation, while rail revenues decreased, due largely to the substitution of bus operation in December, 1925, for rail operation between Norwich and North Grosvenordale. Operating expenses increased principally on account of heavy cost of snow removal in February and December, 1926, and to increased rates of pay granted car and bus operators and shopmen, which was partially offset by increased economies. Taxes also increased, principally those paid the federal government.

On the lines of the New York, Westchester & Boston Railway 11,686,022 passengers were carried during the year, an increase of 1,531,823, or more than 15 per cent. An extension of the road from Larchmont to Mamaroneck, a distance of 1.79 miles, was opened for business on March 21, 1926. The number of passengers handled during the year at the two stations on the new extension was 526,051. A new station was constructed and opened for business on Nov. 7, 1926, on the White Plains Branch at Ridgeway. Extension of the road to Harrison, a distance of 1.70 road miles, is under construction and will be opened for business about June 1, 1927. There will be two stations on this extension.

The accompanying table shows the income account of the electric railway properties of the New York, New Haven & Hartford Railroad in 1926 compared with 1925.

An interesting reference is made in the report to the law enacted by the Legislature permitting the New Haven road to take over the securities of the New England Investment & Security Company, which owns the Springfield Street Railway and the Worcester Consolidated Street Railway. The New Haven company reiterates its faith in the electric railway industry. It states the company "is proceeding to rehabilitate the Worcester and Springfield properties in the hope that by placing them upon a profitable basis it may realize the whole or at least the greater part of the above investments." The company says that there seems to be no reason why, with up-to-date facilities, the railways in Worcester and Springfield might not materially increase their revenues and decrease their expenses.

U. G. I. After Day & Zimmermann

Utility Holding Company Arranges to Take Over Engineering and Management Organization—Engineers to Continue Active in Management of Utility Properties

The United Gas Improvement Company, Philadelphia, has obtained a controlling interest in Day & Zimmermann, Inc., Philadelphia, subject to the approval of the stockholders.

Arthur W. Thompson, president of the United Gas Improvement Company, says the business of the firm of Day & Zimmermann, Inc., will continue under the direction of Messrs. Day and Zimmermann. According to Mr. Thompson, the transaction is in line with the U.G.I. policy to extend its activities in co-ordinated public utility management, engineering and construction, as well as to acquire financial interest in such properties as may offer opportunities for consolidations and development of benefit to the public and investors. He said:

> The United Gas Improvement Company, with the rapid growth of its subsidiary companies and its extensive interest in associated properties, is fortunate in supplementing its holdings and personnel with an organization of such high standing as that of Day & Zimmermann, Inc., as the extent to which pressing needs for constructive public utility and industrial development and management can be undertaken is limited by the available supply of qualified executives and assistants to assume such responsibilities.
>
> There is much to be done in this field of endeavor which will react to the benefit of the public generally as well as customers and investors such as should result from effective supervision, co-ordination and the advantages of economic expansion plans.
>
> There will be no change in the method of conducting the business of the firm, which will continue under the direction of Messrs. Day and Zimmermann and their capable associates and organizations, as their leadership will undoubtedly produce results in the future as gratifying as have been their achievements in the past.

Day & Zimmermann, Inc., are engaged in the general business of engineering and construction, special investigations, appraisals and reports, and management of public utilities and industrial enterprises.

The work of their investigations and reports department has covered all branches of public utilities and a wide variety of industries in every state in the Union and in South America and Europe. In connection with this work an office is maintained in Paris. The clients served by this department include many of the foremost bankers of the country as well as the largest public utilities and industrial organization.

The engineering and construction division has had a diversified and valuable experience in the planning and

INCOME ACCOUNTS

	Connecticut Company		Berkshire Street Railway		New York, Westchester & Boston		New York & Stamford	
	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*	Year 1926	Comparison With 1925 Increase or *Decrease*
Operating revenues:								
Passenger	$13,931,990	$137,147	$810,387	*$10,601*	$1,739,343	$230,662	$423,567	*$89,703*
Other	717,691	*9,641*	40,271	2,385	172,362	32,141	3,539	*1,139*
Total	14,649,682	127,505	850,659	*8,215*	1,911,705	262,804	427,107	*90,842*
Operating expenses:								
Maintenance of way and structures	1,977,900	120,119	144,554	2,014	129,211	*6,794*	67,074	11,080
Maintenance of equipment	2,000,281	92,092	129,505	20,816	252,571	115,467	134,807	87,293
Transportation	6,773,770	191,677	419,896	*4,023*	606,080	65,568	183,791	*26,103*
Other	1,165,564	*71,558*	57,466	*17,481*	259,434	12,617	71,231	*623*
Total	11,917,518	332,330	750,973	1,326	1,247,298	186,859	456,905	71,647
Net operating revenue	2,732,164	*204,825*	99,686	*9,541*	664,406	75,944	*29,798*	*162,489*
Tax accruals	790,832	160,504	34,631	14,486	237,442	21,154	22,739	*607*
Operating income	1,941,331	*365,329*	65,055	*24,028*	426,964	54,789	*52,537*	*161,882*
Non-operating income	71,653	20,895	1,654	*4,507*	9,477	2,506	2,278	1,423
Gross income	2,012,985	*344,434*	66,709	*28,535*	436,442	57,296	*50,258*	*160,458*
Deductions from gross income	1,477,521	*14,424*	*302,581	*129*	*2,194,689	142,742	*114,993	1,426
Net income	$535,464	*$330,009*	†*$235,871*	*$28,406*	†*$1,758,247*	*$85,446*	†*$165,252*	*$161,884*

Italics denote decreases. † Deficit.

* Berkshire Street Railway—deductions from gross income include $210,066 interest accruing to N.Y., N.H. & H. R.R., but not included in income account.

New York, Westchester & Boston—deductions from gross income include $1,157,841 interest accruing to N. Y., N. H. & H. R.R., but not included in income account.

New York & Stamford—deductions from gross income include $40,763 interest accruing to N. Y., N. H. & H. R.R., but not included in income account.

construction of industrial plants, public utility properties, piers, bridges, and recently has been active in the construction of hotels, hospitals, etc.

The prospective purchaser explains that the public utility management bureau has been doing an unusually constructive service for many years in the upbuilding of properties along sound lines, looking toward the rendering of the best service to the public and the holders of the various securities. From the commencement of these operations, fifteen or more years ago, every effort has been made to place the administration and operation of the properties on the highest possible plane comparable with the best that has been accomplished in the industrial field, in this way assuring not only the most efficient operation and safety of investment but the fullest measure of co-operation with regulatory bodies.

Among the properties at present under the management of Day & Zimmermann are:

The National Public Service Company, a holding company, which through its subsidiaries in New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, Georgia and Florida, furnishes electric light and power, gas, steam and electric railway, bus, ice and water service to 874 communities with a population of 2,139,000 and consolidated gross earnings of $27,788,000.

The General Public Utilities Company, which furnishes directly or through its subsidiaries electric light, ice and water to sixty towns in the States of Florida, Louisiana, Texas, New Mexico, Arizona and South Dakota, with an aggregate population of about 200,000 and gross earnings of $4,055,000.

The Southern Ohio Public Service Company, which is an operating company serving the city of Zanesville, Ohio, with electric light and power and street railway and a bus or interurban system, with a population of about 30,000 and gross earnings of $1,546,800.

One of the first properties organized by Day & Zimmermann, Inc., was the Penn Central Light & Power Company, which was recently acquired by the Insull interests.

Following the original announcement about the deal, it was made plain that the controlling interest in Day & Zimmermann, Inc., will be obtained by the United Gas Improvement Company through an exchange of securities. Stockholders of that company will be called upon to meet in the autumn to pass upon the plan to issue the amount of U.G.I. stock necessary to fulfill the terms of the transaction. Mr. Thompson said:

> We wish to emphasize the fact that Day & Zimmermann, Inc., will continue to be very active in the management and operation of the various properties which have been so successful under their direction. This transaction, involving properties in fourteen states, has been under way for several months. When all the details of financing are worked out the stockholders and customers of the various Day & Zimmermann properties will find that their business will continue to be operated on the same high standard under the leadership of Charles Day and John E. Zimmermann, aided by the same men whose skill and vision have placed the management in the forefront of the public utility industry.

Bonds of Omaha Company to Be Extended

Plans are being advanced for the extension of the $9,155,000 of first consolidated mortgage 5 per cent bonds of the Omaha & Council Bluffs Street Railway, Omaha, Neb., from Jan. 1, 1928, then maturity date, to Jan. 1, 1931, at an advance in interest to 6 per cent. The trustee of the issue is the Guaranty Trust Company, New York. The bonds are secured by an absolute first mortgage on the 130.5 miles of track in Omaha. It is expected that in the interval between July 1, 1927, and Jan. 1, 1931, the question of the relations between the company and the city with respect to its franchise rights will have been satisfactorily adjusted.

Traffic and Revenue Results in Akron

Gross earnings of the transportation department of the Northern Ohio Power & Light Company, Akron, Ohio, for the year ended Dec. 31, 1926, were $454,255 less than in 1925. This loss of revenue is accounted for by further increases in the number of privately owned automobiles and because of partial suspension of railway service in Akron and on the interurban railway divisions in May last year. This suspension of service was caused by a strike or "walkout" on the part of some of the employees in the transportation department. The strike lasted from May 1 to May 22, when most of the men returned to work. This explanation was included in the annual report of the company to the stockholders.

The total number of revenue passengers carried was 63,372,334, compared with 65,619,603 in 1925. Of the total number of revenue passengers during the year 48,973,671, or 77 per cent, were carried on the city railway and bus lines and 14,398,663, or 23 per cent, were carried on the interurban and bus lines. Segregated figures show that the city divisions carried 2,379,178 fewer passengers in 1926 than in 1925 and that the interurban divisions carried 131,909 more passengers than in the preceding year.

Comparative figures of revenue passengers carried on rail and bus lines follow:

	City Systems	Interurban Systems
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,478,984
1925	51,352,849	14,266,754
1926	48,973,671	14,398,663

A total of 140,696 tons of freight was handled during 1926 and the gross revenue therefrom was $614,762, compared with 160,823 tons handled in 1925 and gross revenue of $647,711.

In the transportation department the company continued its efforts in improving its service to meet the demands of the public. During the year it added quite largely to its motor bus equipment, and for the purpose of improving the special express bus service operating in Akron at a 10-cent fare it purchased two double-deck buses specially designed for one-man operation. To facilitate operation both of these buses are provided with front entrance, and one of them has the stairway from main to upper deck in the front part of the bus instead of the rear.

Among additions and improvements are included the following:

Purchase of 35 single-deck and two double-deck buses for operation in city and interurban service.

INCOME ACCOUNT OF THE NORTHERN OHIO POWER & LIGHT COMPANY FOR THE YEAR ENDED DEC. 31

	1926	1925
Gross Earnings:		
Electric	$6,317,554	$5,322,156
Transportation	5,723,286	6,177,541
Total	$12,040,840	$11,499,698
Operating expenses and taxes:		
Operating expenses	8,181,133	7,618,402
Taxes	802,200	822,000
Total	$8,983,333	$8,440,402
Gross income	3,057,507	3,059,296
Interest—net	1,527,628	1,428,680
Amortization of debt discount and expense	132,670	129,161
Total	$1,660,299	$1,557,841
Net income available for dividends and retirement reserve	$1,397,208	$1,501,454
Dividends on preferred stock	473,824	437,334
Balance	$923,383	$1,064,119
Ratio of operating expenses to gross earnings, per cent	67.94	66.25
Ratio of operating expenses and taxes to gross earnings, per cent	74.61	73.40

Rebuilding and equipping 46 city-type electric cars for one-man operation.

Purchase of 25 new freight trail cars and the reconstruction work necessary to convert two interurban passenger cars into freight motor cars.

Completion of modern freight houses in Akron and Bedford.

Renewal and reconstruction of track, both interurban and city, at various places on the system.

On the question of safety and accident prevention the report states that the situation is gratifying because of the good results obtained in the face of increases over 1925 in the number of car and bus miles operated and in the registration of private automobiles. Despite the great increase in automobile registrations from year to year and the resultant congestion of traffic, there were fewer accidents on the property in 1926 than in 1920.

B. C. Cobb, president, refers to the expiration of franchises for electric railway operation in the city of Canton on Feb. 23, 1928, and in the city of Akron on Nov. 12, 1928. In negotiating with the city authorities with respect to renewal rights, the management, he says, will make every effort to conclude fair and reasonable arrangements from the standpoint not only of return on the value of property used in rendering transportation service to the public but also from the standpoint of the people served.

Easement Case Closed in Baltimore

A valuation for easements of the United Railways & Electric Company, Baltimore, Md., probably will be fixed by the Public Service Commission within a month. Harold E. West, chairman, so announced on June 13 at the conclusion of hearings in the matter before the commission. A valuation of $7,000,000 was set originally by the commission, but a court order, following an appeal, required a rehearing of the case.

Edwin G. Baetjer, associate counsel for the United, at the hearing on June 13 charged that the valuation figure of $2,773,000 submitted by Thomas J. Tingley, people's counsel, was full of errors. Mr. Tingley in his final argument cited the opinion of the Court of Appeals in ordering the case to be reheard before the commission and interpreted it to mean that the court expected a lower valuation than $7,000,000 for the easements. Mr. Tingley said that the Court of Appeals recognized the fact that the value ascertained for rate purposes should be a relatively small one.

Counsel for the United contend that approximately $11,000,000 is the proper valuation for the easements.

Bus Lines in Washington Sold

The Washington Rapid Transit Company, owning bus lines in Washington, D. C., has been sold by the North American Company to Harley P. Wilson, who recently became a director in the latter company. The line is pressing an application before the Public Utilities Commission for a 10-cent fare. The North American Company is interested financially in the Washington Railway & Electric Company.

Revenue in Fort Wayne Higher

Operating revenue of the Indiana Service Corporation, Fort Wayne, Ind., in 1926 was $4,345,946, according to the annual report of the company made public on March 2. The figure shows a gain of $490,057, or approximately 13 per cent over operating revenue for the preceding year. Net income of the company in 1926, after payment of all charges, including interest on funded debt, totaled $420,963, as against $348,383 in 1925. Local and interurban transportation service was furnished to 25,667,845 passengers in 1926, compared with 25,648,155 in 1925.

Expenditures aggregating $2,012,000 were made during 1926 for various improvements and additions to the electric utility and railway systems, including the purchase of new equipment, construction of a new freight terminal, car shops and stores building at Fort Wayne.

The company acquired during the year the electric light and power and electric railway properties of four interconnected utility companies in the vicinity of Fort Wayne.

Robert M. Feustel, president, told the stockholders that a new issue of $890,000 par value 6 per cent preferred stock was offered to investors during the year. This issue is on a parity in every respect with the 7 per cent preferred stock issued in 1925, except as to annual dividend rate and callable price. The proceeds of the sale of this stock are being used to finance current corporate requirements.

Equipment trust certificates of series E in the principal amount of $160,000 and bearing interest at the rate of 6 per cent per annum were issued in 1926 to finance the acquisition of the five new passenger coaches and two parlor-buffet cars mentioned above.

As a result of the offering for sale of the new 6 per cent preferred stock, increasing numbers of customers, employees and other residents of the territory served became part owners of the company during 1926. A total of 4,238 stockholders was recorded on the company's books on Dec. 31, 1926. This represents a gain of approximately 256 per cent over the number recorded at the close of 1925.

Revenues in Albany Show Decrease

In the 97th annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1926, statistics and operating results of the United Traction Company, Albany, N. Y., are included.

Operating revenues of the United Traction Company from all sources during 1926 amounted to $2,933,522, a decrease of $157,097; operating expenses were $2,370,907, a decrease of $58,768, and taxes were $213,100, an increase of $9,550. Operating income was $349,515, compared with $457,394 in 1925. Among the items of decreased operating expenses were: Injuries and damages, $12,828; paving, $2,947; transportation expenses, $59,800; power purchased, $2,205; maintenance of equipment, $20,215, and general and miscellaneous expenses, $2,639. These decreases were partly offset by increases in maintenance of structures, $129; maintenance of power and line, $8,747; track and roadway labor, $2,217; track and roadway material, $1,728; cost of removing snow and ice, $20,539, and equipment retirements, $8,579.

The company's proportion of the cost of new pavement laid in 1926 was $82,148, of which $29,603 was chargeable to operating expenses and the balance to cost of property used in public service. Reconstruction of tracks, made necessary by the continuation of street paving programs, cost the company $40,357, requiring charges to operating expenses of $37,507.

A petition for increased fare is now pending before the Public Service Commission and hearings have been concluded. The proceeding was delayed by an appeal to the courts, made necessary by the claim on behalf of certain municipalities that franchise restrictions deprived the Public Service Commission of authority to award reasonable rates. The Appellate Division, Third Department, denied these claims.

Operating revenues of the Hudson Valley Railway during 1926 amounted to $773,399, operating expenses to $787,308 and taxes to $50,850. There was an operating deficit for the year of $64,759, comparable with a deficit of $40,240 in 1925. Operating revenues decreased $60,526, operating expenses decreased $31,157, and taxes decreased $4,850.

The abandonments authorized by the Public Service Commission during the year 1925 have been physically completed. Application has been made to the Public Service Commission for permission to abandon the branch line between Thomson, N. Y., and Greenwich, N. Y., and the branch extending from Lake George, N. Y., to Warrensburg, N. Y.

Operating revenues of the Capitol District Transportation Company, Inc., bus subsidiary of the United Traction Company, amounted to $303,651 during 1926; operating expenses to $353,350 and taxes to $2,592. There was an operating deficit for the year of $52,291. On Nov. 6, 1926, operation of buses was started over what was formerly the Albia Line of the United Traction Company. A franchise to operate buses on the Third Street, Rensselaer Line of the United Traction Company was obtained during the year, and it is proposed to start bus service on that line during the early part of 1927.

Bonds of Berkshire Company Extended

The Department of Public Utilities of Massachusetts has approved the purchase by the New York, New Haven & Hartford Railroad of first mortgage bonds of the Berkshire Street Railway, Pittsfield, Mass., to the extent of not to exceed 50 per cent of the outstanding $770,000 of bonds so as to protect the railroad's stock interest in the railway. The New Haven company owns all of the capital stock of the Berkshire company. The bonds were extended in maturity date from June 1, 1922, to June 1, 1927, and have been further extended to June 1, 1937, at 6 per cent interest. The rate at present is 7 per cent. The New Haven Railroad is to pay not more than par for any of the bonds that it takes.

C. Q. Richmond, vice-president of the Berkshire Street Railway, has explained to the bondholders that the situation which has confronted the company, in common with most other electric railways, resulting from the increase in the use of the private automobile, made it difficult, if not impossible, for the company to provide the funds to pay off the bonds on June 1, or to arrange at this time to refund them upon satisfactory terms. Consequently, it became necessary for the directors to ask the bondholders to co-operate in a further postponement of the maturity date for the payment of the principal of the bonds.

The extension agreement provides that holders of the bonds may become parties thereto by deposit of their bonds with Harris, Forbes & Company, Inc. Bonds so deposited will be stamped with a reference to the agreement and additional coupons will be annexed to the deposited bonds providing for the payment of interest at the rate of 6 per cent on such bonds to and including June 1, 1937.

Mr. Richmond expressed the hope that all bondholders would defer the demand for payment of the principal of their bonds, but he explained that the principal stockholder of the railway, the New York, New Haven & Hartford Railroad, had agreed to purchase the bonds at par from holders who felt under compulsion to sell.

Road in Homestead to Be Abandoned.—Officials of the Homestead & Mifflin Street Railway, Homestead, Pa., organized in 1902 and operating a 3.7-mile line from Homestead to Lincoln Place, say they will abandon the line on Aug. 1. Stockholders claim they lost $20,000 on the Homestead lines in the last 25 years. Contemplated street improvements over the company's route would entail a $300,000 expenditure, which the stockholders do not feel able to meet. A bus line will supplant the railway system.

Personal Items

Up From the Ranks

H. M. Littig Advanced from Conductor to General Manager of Utility at Davenport

"What chance has a street car conductor today? He can never become anything else. The minute he takes such a job he admits to the world his business ability is nix, that he could not hold down a bigger and better job."

This remark was made by a young conductor in a midwestern city to a passenger who had asked him in a friendly way how he was getting on.

That same day in the same city the newspapers carried the announcement of the appointment of Harry E. Littig to be general manager of the Peoples Light Company, a $6,000,000 corporation. It was a promotion, the newspaper stories stated, for the new general manager had long held a responsible position with his company. Comment was made on his prominence in civic affairs and his other business connections, but none of these facts comprised the feature of the story.

H. M. Littig

What seemed to stand out as significant was that the new general manager had risen from the ranks of labor to the chair of business administration. He had worked his way up from the bottom. Mr. Littig is only in his forties and his future in the field of business is still an open road.

Leaving an Iowa farm, Harry Littig, a lad of 20, worked his way through a six months course in a business college in which unusual ability for figures was indicated. This course finished he applied for a job as street car conductor. Although he was under the required age of 21 the railway manager hired him. He liked the boy's looks. For a year and a half the young man ran a street car. His reports were so neat and his cash balanced so well with his trip sheets that on heavy days and during rush hours the manager put him on congested lines to collect fares.

One Sunday morning his chance came, his first chance. The cashier was sick. He heard about it on his early morning run and applied to the general manager for the job.

"Do you think you can do it?" the manager asked doubtfully.

"I'd like to try," the young man answered.

Pointing to the safe where the receipts of the runs during the last twelve hours were deposited, the manager handed the applicant the combination of the safe and said: "Go to it." A half hour later Mr. Littig said: "I have finished this. What shall I do next?"

Much in doubt as to its accuracy, owing to the record time in which the cash balance had been arrived at, the general manager checked the work done.

"It's the first time we've had an exact balance in six months," he commented. "We'll try you out."

Becoming cashier, Mr. Littig soon fell under the bookkeeper's eye. "Ever do any bookkeeping?" that worthy asked.

"A little," was the reply.

"Then you might as well help me out," the bookkeeper replied. And soon the cashier was doing most of the bookkeeping as well. Several months later the management made the young cashier the bookkeeper. Always knowing how to work and always willing to work, Mr. Littig became, as the years went along, chief clerk, then assistant treasurer, then assistant secretary and then secretary. While he was growing his company was also growing. From a railway undertaking it had grown to a railway and light enterprise. Today it is a subsidiary of a $190,000,000 corporation, the United Light & Power Company.

In these years Mr. Littig's home town, Davenport, Iowa, has also been growing, and with it he has grown, serving in every public money raising campaign in recent years, as president of the local Kiwanis club, as director in a score of volunteer movements where the only recompense was a sense of satisfaction in fulfilling one's civic duty. He is to-day essentially the same Mr. Littig who 31 years ago worked twelve hours a day, wore a uniform, had a number, ate cold lunch out of a lunch box and swept out his car with a broom.

O. D. Young Honored

The degree of Doctor of Commercial Science was conferred on Owen D. Young, chairman of the board of the General Electric Company, at the 95th annual commencement program at New York University held on June 8. Chancellor Elmer Ellsworth Brown, in conferring this honor, said that in American experience the practicing lawyer has passed by a more direct route to a position of leadership in a capital industry. Happy was the man who, having acquired so varied an experience and influence, found occasion to use his ripened powers for the public good; twice happy when he found occasion to use them for the wider good of the family of nations.

New Superintendent at Porto Rico —S. Howard Reid

S. Howard Reid has accepted a position with the Porto Rico Railway, Light & Power Company, San Juan, P. R., as superintendent of its electric railway division. This assignment became effective on June 13. For a number of years Mr. Reid has been superintendent of construction of export cars at the Philadelphia plant of the J. G. Brill Company.

The new incumbent at Porto Rico has been identified with the car building industry for more than 24 years. After leaving school he started his career with the Harlan & Hollingsworth plant at Wilmington, Del., from which he went to the American Car & Foundry plant, located in the same city. In 1902 he joined the forces of the J. G. Brill Company. Back in 1907 and up to 1909 he constructed and placed in service some of the first American equipment sent to Porto Rico, and in later years supervised the construction of a number of cars for Honolulu and Finland, which he also placed in service. Later he served as superintendent of equipment of the Honolulu Rapid Transit Company, which post he held until 1926, when he resigned to return to the Brill company.

S. H. Reid

Messrs. Luellen and Wells Promoted in Anderson

Ross E. Luellen, division passenger and freight agent of the Union Traction Company of Indiana, Anderson, Ind., was appointed assistant general passenger and freight agent with headquarters in Anderson effective on June 10. Mr. Luellen has been with the company since June, 1903, when he entered the service as clerk. Later he was made assistant claim adjuster and then promoted to safety engineer. From that position he was advanced to division passenger and freight agent.

Effective the same day, Ray J. Wells has been appointed chief clerk in the traffic department and will have charge of the advertising department. Mr. Wells was formerly secretary to the general manager. For seven years he was secretary to the general storekeeper of the C. C. C. & St. L. Railroad (the Big Four). He saw service in France in the railway engineering corps during the World War.

Changes in Brooklyn Personnel Announced

Three new division superintendents in the surface transportation department of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., were appointed recently to fill vacancies caused by recent transfers and deaths in the organization. The new appointees are John H. Dirlam, at Flatbush depot; Joseph E. McClenahan at Bergen Street depot, and William J. Roome, at 58th Street depot. Mr. Dirlam succeeds the late John Mooney and Mr. Roome takes the place of the late Morton S. Cornell. Mr. McClenahan succeeds Herman Bongard, who is now on the staff of the Accident Prevention Bureau.

In addition August J. Eck was appointed assistant division superintendent. He is assigned to the Ninth Avenue depot to assist Charles B. Attlesey, division superintendent in charge of that depot. All these positions were filled by men who have worked their way up from the ranks. Three of the men started their careers in Brooklyn as conductors and the fourth as a transfer agent.

Guy Eastman Tripp Dead

Chairman of Westinghouse Company Was an Officer of More than 25 Corporations—Man of Many Talents, Widely Known for His Managerial Skill and Financial Ability

GUY EASTMAN TRIPP, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, a director and officer in more than a score of other corporations and a prominent figure in the public utility field for many years, died on June 14 at the New York Hospital, at the age of 62 years. He had been ill since February. On several occasions Mr. Tripp had so far recovered that he had been able to leave the hospital for a drive, and his restoration to health was at one time anticipated. Last month, however, a new, though minor, operation became necessary, and although he rallied from this and had even reserved accommodations at Atlantic City for the convention of the National Electric Light Association last week, a relapse set in.

Mr. Tripp possessed the organizing and executive type of mind developed to the full with no handicap of timidity. He was a business leader, a financier and a harmonizer. In his earlier days he displayed the ability to master detail, but as he was called upon to command he quickly developed the capacity to delegate details to others. He could get at the heart of a problem, shape a policy and leave others to work it out. He was not an engineer, but he could point the way to engineers. He always kept at heart the interests of the people at large, and while an advocate of private ownership of utilities under state regulation, he was, whether right or wrong, broadminded enough to declare that there might be conditions under which public ownership would be effective. His was an enlightened sense of business responsibility.

The foundation was there upon which to build, but Mr. Tripp spent a long term of apprenticeship in which he was engrossed in mastering the essentials of financial and management problems. In consequence, the ability displayed by him in later life to follow the intricacies of financial, engineering and operating problems came as a source of wonderment to those who were unacquainted with the breadth of the man's experience and were not in a position to know the extent to which he had gone to ground himself with an intimate knowledge of the basic facts. Mr. Tripp knew. And others knew that he knew, although they did not always understand how it was that he knew. So he was called to one stupendous job after another.

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Guy E. Tripp

In all the history of American business operations there were no reorganizations that called for the exercise of greater financial and management skill than the rehabilitation of the Westinghouse company and the Metropolitan Street Railway. His accomplishments in these two instances alone would inscribe the name of the man high on the roll of honor of the immortals of organized business, but outstanding as were the achievements of Mr. Tripp in both of these instances they represented only a small part of the man's vast work.

Quite naturally men in railway circles, acquainted with Mr. Tripp's record for efficiency and appreciative of his wide knowledge of railway matters, felt relieved at his choice in 1910 as chairman of the joint committee on reorganization of the Metropolitan Street Railway, New York City, which had just passed into the hands of a receiver. The Metropolitan had many subsidiaries; the receivership, had of course, caused much concern among stockholders; possessors respectively of senior and junior securities were engaged in internecine warfare, and disaster loomed. For two years Mr. Tripp worked at his new task, evolving by degrees a solution that proved acceptable to the conflicting interests.

Then in January, 1912, he was unanimously invited by the directors of the Westinghouse Electric & Manufacturing Company to become chairman of their board. He went to the company while it, too, was emerging from a receivership, forced on it during the troublous times of 1907. It had been piloted through the crisis by Robert Mather, whose death left the vacancy that Mr. Tripp was called to fill. His duties concerned in the main the financial and foreign interests of the company, and he carried out, with clear insight and a firm hand, the reorganization of its capital structure and did much to place the company on the sound basis it now occupies, with annual gross earnings of $185,543,000 as of March 31, 1927, and a net manufacturing profit of $15,779,000. On assuming the chairmanship of the Westinghouse board Mr. Tripp resigned from the Stone & Webster organization.

When the United States entered the war Mr. Tripp was appointed by the Department of War chief of the production division of the Ordnance Department, instrusted with the task of supervising and stimulating the production of all ordnance supplies. He was breveted an officer and soon rose to the rank of brigadier-general, the title of "General," by the tacit insistence of his friends and associates, sticking to him for the rest of his life. When the World War broke out the Westinghouse company obtained large contracts from the British and Russian governments for the manufacture of munitions, and Mr. Tripp was thus able to bring not only his great ability but the highest type of experience to his new duties. He cut through red tape and decentralized bureaus with a vigor of action and clearness of perception such, it was declared, as official Washington had seldom seen, dividing the country into districts, each in charge of a district chief, and supervising the expenditure of $16,000,000,000. For his patriotic services General Tripp received from Congress a distinguished service medal.

Leave of absence was granted the General by the Westinghouse board during his war-time service. When the conflict was over he resumed his duties with the company. In 1923 these took him to Japan in connection with reconstruction work after the disastrous earthquake. He completed arrangements in that country for the organization of a manufacturing company at Nogoya with $7,500,000 capital. The

Japanese government conferred upon him the highest decoration that it could award to a civilian foreigner.

Likewise in the radio industry, Mr. Tripp, following his pioneering instinct, devoted his energies to the new art, and to him was due in large measure the position of leadership in radio manufacture and broadcasting that Westinghouse assumed and maintained. Another favorite interest of Mr. Tripp's was "superpower." He was among the first to grasp the part that interconnection would come to play in the world of light and power, and he did much to bring its significance home to the public.

ENTERED BUSINESS IN 1883

Mr. Tripp's business career began in earnest in 1883, when the Eastern Railroad—now part of the Boston & Maine—employed him as a clerk at Salem, Mass. After seven years with the railroad he changed his post for one with the United Electric Securities Company. With this company, the Thomson-Houston Electric Company and the Industrial Improvement Company, a branch of the then newly organized General Electric Company, which had absorbed the Thomson-Houston firm, he spent another seven years, working as accountant and auditor. Then, in 1897, at the age of 32, he began a connection with Stone & Webster, already engaged in the development of public utilities, that opened before him the path of substantial success. He was soon appointed a traveling auditor for this company, then was made a manager of utility properties in the West and South, and finally a vice-president of the parent engineering and management organizations. In addition he came to fill high executive offices in subsidiary companies in the States of Texas, Washington, Kentucky, Minnesota and Massachusetts.

Mr. Tripp was born in the village of Wells, in the southeast corner of Maine, on April 22, 1865. His academic instruction was obtained in a two-year course at the South Berwick Academy, near his birthplace. He went into a country store at Wells, and this, he often said, was his training school for judging values quickly, which stood him in good stead later in his life. That later life was crowded with such interests as engineering, electrical development, railroads, economics, politics, learning, sports and social intercourse.

A SPEAKER OF NOTE

The wonder was that the man found the time and had the energy to carry on all the multifarious activities in which he indulged. Among his notable addresses was the one made to members and representatives of the American Electric Railway Association on Feb. 20, 1925, at the annual dinner in connection with the association's midwinter convention. He discussed the place of the bus in transportation, mass transportation versus de luxe service, and urged single control of transportation facilities.

As indicated previously, Mr. Tripp manifested an especially keen interest in the future of electrical development in America. His war-time experience convinced him that power was an essential factor in our prosperity and he made an exhaustive study of the American power situation in order to determine the best and most efficient methods of power generation, transmission and distribution. His articles and addresses on power development attracted wide attention, and a compilation of the more important of these, published under the title of "Superpower as an Aid to Progress," is regarded as an authoritative contribution to this subject.

Tributes and Appreciations

From General Tripp's large circle of friends and associates many expressions of sorrow, admiration and personal regard were elicited when news of his death became public. A few of these are printed below:

From LUCIUS S. STORRS, *managing director American Electric Railway Association:*

"An incalculable loss has been suffered by the electrical industry, and particularly by the transportation industry, through the death of General Guy E. Tripp. It is a loss which all of us feel most deeply: a great personal loss as well as the loss of a progressive and courageous leader and wise counsellor. The electric railway industry will be forever indebted to him for the great works he wrought for it. His genius for organization, his broad vision, his farsightedness, his high patriotism, his courage and his intensely earnest friendships empowered him to great achievements for the industry to which he devoted his life and for the nation that he loved and served. Those of us who knew him intimately will miss him grievously, but his good works are builded upon an enduring foundation."

From GERHARD M. DAHL, *chairman of the board Brooklyn-Manhattan Transit Corporation, New York City:*

"General Tripp was a man of great ability, great heart and great soul. He was successful not only in all that he undertook but he tied his friends to him with hoops of steel. His death means a loss not only to the community but also to a host of loyal and admiring friends."

From MATTHEW C. BRUSH, *president American International Corporation:*

"The electrical industry has lost one of its great pioneers, leaders and executives. I know of no other man who had more friends, and in my entire acquaintance with him over a period of twenty-five years I have never heard other than the most kindly commendatory expressions about him by every one who knew him. He was a man to whom all his friends could go for advice, counsel and guidance. His memory will live long in our hearts."

From PAUL D. CRAVATH, *general counsel Westinghouse Electric & Manufacturing Company:*

"General Tripp will be greatly missed in the wide field of business and public activities. He was much more than the chief executive of a great corporation—he was a real leader in the industrial world. Important as is his loss to the business community, his associates in the enterprises in which he was active, and more especially the Westinghouse Electric & Manufacturing Company, will miss him most keenly as a loyal friend and a considerate and inspiring associate. There are few men in the business world who will be so sincerely mourned by so wide a circle of friends."

From H. HOBART PORTER, *president American Water Works & Electric Company:*

"We have suffered a great loss in the death of General Tripp. His influence for good was very strong in all his activities, both in commercial business and in war work. Few came into contact with him without being benefited other than by the geniality and magnetism which he always radiated. These qualities, in addition to his unusual ability, breadth of view and rugged honesty of purpose, endeared him to all with whom he came in contact."

From JAMES H. MCGRAW, *president McGraw-Hill Publishing Company, Inc.:*

"Apart from the important office that he filled, General Tripp's versatility and personal force made him one of the dominant figures in the electrical industry. His influence reached beyond the manufacturing sphere and embraced all electrical enterprise. As chief executive of the great Westinghouse interests his work was of tremendous importance to electrical men everywhere. In the light and power field the steady growth of interconnection owed much to him, and so did the spread of interest in good public relations. He was a steadfast friend of the technical press, to which he contributed much encouraging retrospect and prophecy through interviews and original articles. But among those who had the privilege of calling General Tripp their friend all such considerations are swallowed up in sorrow for the loss of an associate with so many sterling qualities. There was a nobility about him that endeared him to all. His genuineness and his faith in the electrical industry, in his co-workers and in his own ideas were a great resource to many men. His splendid qualities of leadership will be long remembered."

From OWEN D. YOUNG, *chairman of the board General Electric Company (radio message from S.S. "George Washington"):*

"The death of General Tripp takes from the electrical manufacturing industry one of its ablest and most charming men. He had all the qualities of a great leader, the capacity to foresee, the courage to act and the ability to execute. I have known him intimately for more than ten years with constantly increasing admiration and affection."

Others who expressed briefly, by wire, their sense of what the electrical industry, the business world and they themselves personally had lost through the death of General Tripp were Samuel Insull, president Commonwealth Edison Company, Chicago; E. S. Webster, president Stone & Webster; Thomas N. McCarter, president Public Service Corporation of New Jersey, and E. H. Gary, chairman United States Steel Corporation.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Pools and Cartels Summarized at Geneva

By Edward J. Mehren
Vice-President McGraw-Hill Publishing Company, Inc.

This is a continuation of Mr. Mehren's article on the final session of the International Economic Conference which appeared in last week's Journal, page 1068. — Editor's Note.

Pools and cartels formed one of the dominant subjects of the conference and resulted in quite a divergence of views. The conclusion was that they must be considered as good or bad, according to the spirit of their constitution and operation and the attitude of their managers toward the general interest. The field for such agreements, both national and international, is usually limited, so the conference declared, to branches of production already centralized and to products supplied in bulk or recognized grades.

Where applicable they can secure a more methodical organization of production, a reduction in cost by better utilization of equipment, the development on more suitable lines of new plant, a more rational grouping of undertakings, can check economic competition and reduce the evils resulting from fluctuations in industrial activity. By this means they may assure to the workers greater stability of employment, and at the same time by the reduction of costs and selling prices bring advantages to the consumer.

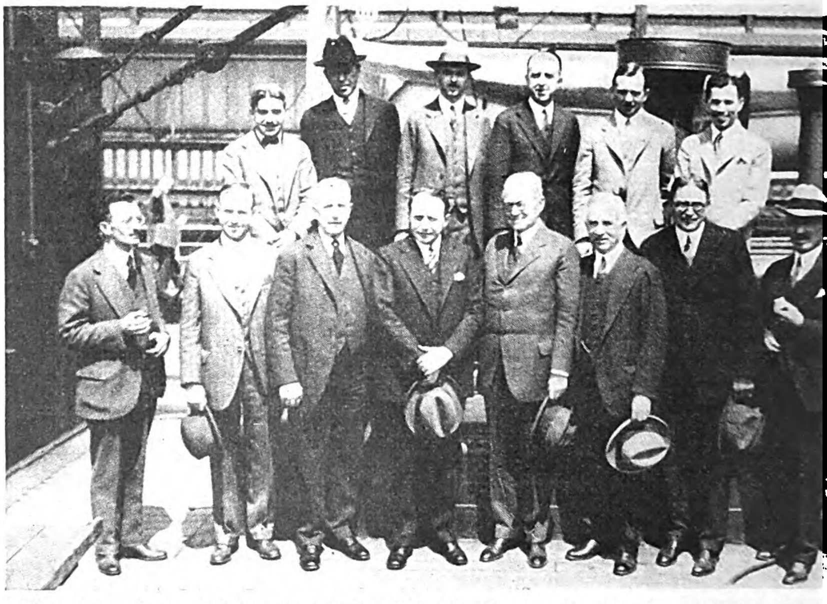
Nevertheless, the resolutions declared, if such agreements encourage monopoly and the use of unsound business methods, they may check technical progress and endanger the legitimate interests of sections of society and particular countries. Consequently such combinations should not lead to an artificial rise in prices, which would injure consumers, and should give due consideration to the interests of the workers. They should not restrict the supply of raw materials or basic products to any particular country nor create unequal conditions between the finishing industries of the consuming and producing countries. Nor must they prevent the development in any country of industries which that nation considers indispensable.

On the question of control of pools, the conference believed that international control of international pools cannot be set up. It recommends, however, that the League of Nations study these international pools, their effects on technical progress, on production, conditions of labor, supply and prices. This information, collected with the aid of the various governments, should be published. Such publicity is an effective means, on the one hand, of securing the support of public opinion for agreements which conduce to the general interest, and, on the other hand, of preventing the growth of abuses.

In this series of articles the term rationalization has been taken to mean all mechanisms for reducing cost of production and, therefore, the consolidation of industries has been included; this broad definition is in accordance with the German acceptance of the term. However, the conference limited it to scientific organization of labor, standardization both of material and of products, simplification of processes and improvements in the system of transport and marketing.

While obvious to us in America, the conclusions are so important for Europe that they are given here in full:

> The conference considers that one of the principal means of increasing output, improving conditions of labor and reducing costs of production is to be found in the rational organization of production and distribution.
>
> The conference considers that such rationalization aims simultaneously:
>
> 1. At securing the maximum efficiency of labor with the minimum of effort.
> 2. At facilitating, by a reduction in the variety of patterns (where such variety offers no obvious advantage), the design, manufacture, use and replacement of standardized parts.
> 3. At avoiding waste of raw materials and power.
> 4. At simplifying the distribution of goods.
> 5. At avoiding in distribution unnecessary transport, burdensome financial charges and the useless interposition of middlemen.
>
> Its judicious and constant application is calculated to secure:
>
> 1. To the community greater stability and a higher standard in the conditions of life.
> 2. To the consumer lower prices and goods more carefully adapted to general requirements.
> 3. To the various classes of producers higher and steadier remuneration equitably distributed among them.
>
> It must be applied with the care which is necessary in order, while at the same time continuing the process of rationalization, not to injure the legitimate interests of the workers, and suitable measures should be provided for cases where during the first stage of its realization it may result in loss of employment or more arduous work. It requires, further, so far as regards the organization of labor in the strict sense of the term, the co-operation of employees and the assistance of trade and industrial organizations and of scientific and technical experts.
>
> The conference accordingly recommends that governments, public institutions, trade and industrial organizations or public opinion, as the case may be,
>
> 1. Should lead producers to direct their endeavors along the lines indicated above, and, in particular
>
> (a) To encourage and promote in every way the investigation and comparison of the most adequate method and most practical processes of rationalization and of scientific management, and of the economic and social results obtained thereby.
>
> (b) To apply these endeavors in industry, agriculture, trade and finance, not merely to large but also to medium and small undertakings, and even to individual workers and handicraftsmen, bearing in mind the favorable effects which they may have in household organization and amenities.
>
> (c) To give special attention to measures of a kind calculated to insure to the individual the best, the healthiest and the most worthy employment, such as vocational selection, guidance and training, the due allotment of time between work and leisure, methods of remuneration, giving the worker a fair share in the increase of output, and generally conditions of work and



The American delegates of the World Economic Conference at Geneva and the expert advisers who accompanied them

Bottom row, reading from left to right: Henry Chalmers, chief of the foreign tariffs division of the Bureau of Foreign and Domestic Commerce; Dr. Arthur N. Young, economic adviser, Department of State; Roland W. Boyden of Boston, representing the International Chamber of Commerce; Dr. Julius Klein (delegate), director Bureau of Foreign and Domestic Commerce, Department of Commerce; Henry M. Robinson (chairman of the delegation), president First National Bank, Los Angeles; Norman H. Davis (delegate) formerly Assistant Secretary of the Treasury and Assistant Secretary of State; Alonzo E. Taylor (delegate), director, food research, Stanford University; Dana Durand, chief of the research division, Bureau of Foreign and Domestic Commerce.

Top row, reading from left to right: Dr. Louis Domeratzky, chief of the regional division of the Bureau of Foreign and Domestic Commerce; John P. Frey, editor *Molders' Journal*, adviser on labor questions; Edward Eyre Hunt of Washington. D. C., Department of Commerce; Grosvenor Jones, chief of the finance division, Bureau of Foreign and Domestic Commerce; E. W. Camp, commissioner of customs, Treasury Department, and W. L. Finger, secretary to Dr. Julius Klein, serving as administrative aid. John W. O'Leary, the fifth American delegate to the conference, is not in the picture.

life favorable to the development and preservation of his personality.

2. Should carry on systematically on an international as well as a national basis the standardization of materials, parts and products of all types which are of international importance, in order to remove the obstacles to production and trade which might arise from a purely national policy of standardization;

3. Should undertake on an international basis investigations for ascertaining the best methods employed and the most conclusive results obtained in every country in the application of the principles set out above, utilizing the investigations already made in certain countries and encouraging the exchange of information among those concerned.

4. Should spread in all quarters a clear realization of the advantages and the obligations involved in rationalization and scientific management as well as of the possibility of their gradual achievement.

OTHER RESOLUTIONS

With reference to the remaining resolutions, sufficient information has been given in articles already published in this paper to make repetition unnecessary here. The recommendations on commerce were lengthy, occupying, with explanations, thirteen printed pages of legal-cap size. They warrant the careful study of every American interested in foreign trade.

Two days before the closing of the conference the delegation from Russia, or from the Union of Socialist Soviet Republics, as they call it, demanded that there be a resolution recognizing the coexistence of the two economic systems, their own and that of the rest of the world, threatening otherwise to withdraw from the conference. A compromise was reached through the efforts of Roland W. Boyden of Boston, representing the International Chamber of Commerce. He introduced a resolution which declared that the conference recognized the importance of the renewal of world trade and that while refusing to infringe upon political questions regarded the participation of delegates from all the countries present, irrespective of differences in their economic systems, as a happy augury for a pacific commercial co-operation of all nations. This resolution adopted, the Soviet delegates were satisfied and they remained in the conference to the end, though they voted against all resolutions that ran counter to their economic system or practice.

95,374 Sq.Ft.

and

189 Applicants

That was the batting average of the A.E.R.A.'s Exhibit Committee on June 11.

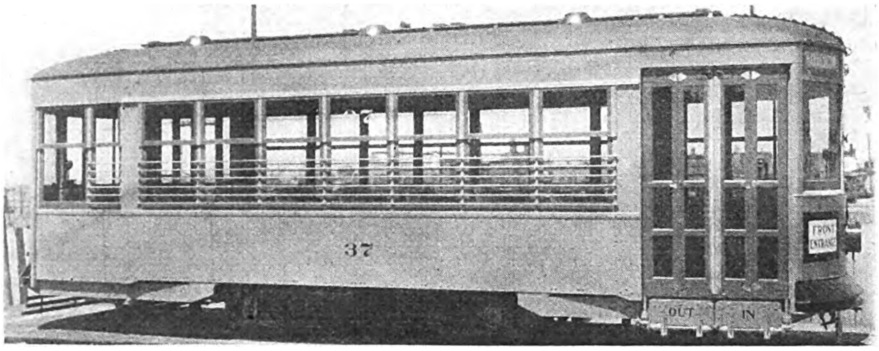
And yet another score!

Three Miles of Show Window Frontage,

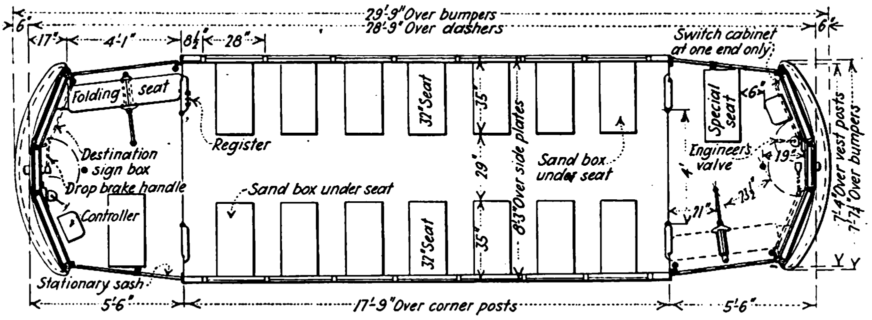
the finest the industry can command, has already been booked. Concentrated buyers plus maximum attention!

You Get It at Cleveland Oct. 3-7

New One-Man Cars Operating in Mobile, Ala.



Two of these 32-passenger one-man, double-end units are now serving the riding public at Mobile



Seating arrangement and general plan of new Mobile cars

Two one-man, city type, double-end cars were delivered to the Mobile Light & Railroad Company, Mobile, Ala., on May 2 by the American Car Company, St. Louis. Subjoined are specifications covering this equipment:

Number of units	Two
Type of unit	One-man, motor, passenger, city, double-end, single-truck
Number of seats	32
Weight, total	20,000 lb.
Length over all	29 ft. 9 in.
Length over body posts	17 ft. 9 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 4 in.
Window post spacing	2 ft. 4 in
Body	All steel
Roof	Arch
Doors	End
Air brakes	General Electric CP-27
Armature bearings	Plain
Axles	A.E.R.A. standard
Car signal system	Faraday
Compressors	General Electric
Control	K-63 BR
Couplers	Detached link and pin
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic Co.
Doors	Folding
Fare boxes	Johnson
Finish	Enamel
Gears and pinions	General Electric
Glass	Plate D. S. A.
Hand brakes	Brill drop handle
Headlights	Ohio Brass
Interior trim	Plain mahogany
Journal bearings	Plain MCB-Brill
Journal boxes	Brill
Lamp fixtures	General Electric
Motors	General Electric, No. 265, inside hung
Painting scheme	Yellow
Registers	International R5
Roof type	Arch
Roof material	Poplar tongue and groove
Safety car devices	Safety Car Devices Co.
Sash fixtures	O. M. Edwards
Seats	Brill
Seat spacing	29 in.
Seating material	Wood
Slack adjusters	Brill
Steps	Folding
Step treads	Feralun safety
Trolley catchers	Earll
Trolley base	U. S. No. 20-A
Trolley wheels	4 in. brass
Trucks	Brill 79-E-2
Ventilators	Brill
Wheels, type	Steel, diameter 26 in.
Special devices	H. B. life guards

Philadelphia Subway Signal Contract Awarded

Through its Department of City Transit Philadelphia has awarded a contract to the Union Switch & Signal Company, Swissvale, Pa., covering the complete installation of automatic block signaling, electro-pneumatic interlockings and automatic train stop equipment in the new Broad Street subway. This subway begins at the City Hall and extends northward 6 miles to Olney Avenue and Fern Rock yard, with the present layout embracing two tracks through this territory. The ultimate future arrangement will provide for four tracks throughout. Included under this contract are 264 color light signals, 93 interlocked switches, 117 electro-pneumatic automatic train stops, etc. Direct current at 630 volts will be used for propulsion purposes of the rolling equipment, with double rail return alternating-current track circuits through the entire block signaling territory. Six electro-pneumatic interlocking plants at City Hall station, Spring Garden Street, Girard Avenue, Erie Avenue, Olney Avenue and the yard portal will be installed, with two storage yard interlockings at Fern Rock, the northern terminus of the subway.

Contention of Toledo Torch Upheld

The United States District Court of the Northern District of Ohio, Western Division, in the case of Wilbert J. McCloskey, trading as McCloskey Torch Company, plaintiff, vs. the Toledo Pressed Steel Company, Toledo, Ohio, defendant, holds that U. S. Letters Patent No. 1,610,301, issued to Wilbert J. McCloskey on Dec. 14, 1926, is invalid as to all of the claims thereto and bill of complaint is dismissed in favor of defendant. This does not affect U. S. Letters Patent issued to the Toledo Pressed Steel Company covering its product the Toledo torch.

Lower Prices for All Metals

Lower prices characterize the domestic markets for all of the non-ferrous metals. Activity in lead has been well up to the average at prices only fractionally lower than a week ago. Zinc has been comparatively quiet, closing the week at 6.25 cents St. Louis. Tin has been moderately active, with prices off about ½ cent, and the copper market has been virtually dead, such sales as have been made in the last two days being at 12.50 cents delivered in the East. Quicksilver and antimony prices are lower, whereas platinum is practically unchanged. Silver has fluctuated within narrow limits, being quoted at 57 cents today. Buying of copper has been practically non-existent, aggregate sales being lower than for any week in the last two years at least. On June 9 two sales were made at 12.725 cents in Connecticut and subsequently several small orders were placed at as high as 13 cents delivered in the Middle West. However, the only sales of consequence since Saturday have brought only 12.50 cents for Connecticut delivery. Buyers, presumably, have been awaiting the appearance of the May statistics, which have just been issued.

With the volume of buying somewhat less than the average, zinc prices have ranged between 6.20 cents and 6.30 cents during the week, the closing price, 6.25 cents, being slightly lower than a week ago. Statistics issued by the American Zinc Institute in tons of 2,000 lb. show the following:

Stock, May 1	41,208
Produced	51,296
	92,594
Shipped	50,458
Stock, May 31	42,046
Shipped from plant for export	4,898
Total retort capacity at end of period	136,844
Number of idle retorts available within sixty days	53,749
Average number of retorts operating during period	79,846
Number of retorts operating at end of period	79,057

The American Smelting & Refining Company has all along maintained its contract price at 6.40 cents, New York, since May 26. On Thursday and Friday some business was done at five or ten points premium over this level, but in the last few days sellers have been unable to get any more than the Smelting company's price except for special lots. Forward lead sold as high as 6¼ cents, St. Louis, on June 9, and a good tonnage was also booked at 6.225 cents. Some sellers, however, were willing to book lead for delivery up to the end of July at no more than 6.175 cents on that day.

Rolling Stock

Houston Electric Company, Houston, Tex., has ordered twenty new street cars powered with four 35-hp. motors from the St. Louis Car Company. The new cars, one of which will be exhibited at the annual convention of the A.E.R.A., at Cleveland in the fall, seating more than 50 passengers, will be larger than any now in use in Houston, and will be of the most modern design, with clear-vision windshield and electric windshield wipers, many safety devices and fully upholstered. They will cost $17,000 each. It is reported that ten new buses have been ordered at a cost of $10,500 each.

Connecticut Company, New Haven, Conn., has ordered from Mack Trucks, Inc., three 29-passenger city type buses, 225-in. wheelbase, four-cylinder motors.

United Electric Railways, Providence, R. I., has ordered four 29-passenger, 233-in. wheelbase, six-cylinder city type Mack buses.

County Transportation Company, New York, bus operating subsidiary of the New York, Westchester & Boston Railway, has accepted delivery of two 29-passenger Mack city type buses, 225-in. wheelbase, four-cylinder motors. Operation in Westchester County will start with twelve buses of this type.

Washington Railway & Electric Company, Washington, D. C., recently purchased three street car type 21-passenger Yellow buses.

Illinois Power & Light Corporation, Peoria, Ill., recently bought seven street car type Yellow buses with a capacity for 21 passengers.

City Railway, Los Angeles, Cal., recently purchased six Yellow buses divided as follows: Four 29-passenger street car type buses on 230-in. wheelbase chassis and two 21-passenger street car type buses, all of Yellow base.

Pacific Northwest Traction Company, Seattle, Wash., has accepted delivery of three Fageol (Cal.) buses. Two of these are of the cupola observation type and the other is a regular observation type parlor car.

Los Angeles Railway, Los Angeles, Cal., has accepted delivery on four street car type buses manufactured by Fageol (Cal.)

Market Street Railway, San Francisco, Cal., recently bought a Fageol (Cal.) street car type bus.

Track and Line

Portland Electric Power Company, Portland, Ore., has received permission to replace the car tracks in Oregon City with the latest type of heavy rails, including the placing of a new concrete track base with cement instead of brick between the rails. Work is to go forward as soon as the new rails arrive. The cost is estimated at $50,000.

The Cincinnati Street Railway, Cincinnati, Ohio, started work June 1 on two additional major track reconstruction projects. One is on Anthony Wayne Avenue, from Lockland Avenue to Mills Avenue, and the other on Montgomery Road, from Blair Avenue to the Norfolk & Western Railroad. The work on Anthony Wayne Avenue involves 12,675 ft. of single track, at an estimated cost of $117,230, and the work on Montgomery Road, 6,253 ft. of single track, involving an expenditure of $66,467. The type of construction specified is 93-lb. T-rail, 7 in. high, on steel ties imbedded in concrete, and welded joints.

ELECTRIC RAILWAY MATERIAL PRICES—JUNE 14, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.50
Lead, cents per lb.	6.40
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.63
Tin, Straits, cents per lb.	67.75
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.475
Somerset mine run, Boston	1.875
Pittsburgh mine run, Pittsburgh	2.05
Franklin, Ill., screenings, Chicago	‡
Central, Ill., screenings, Chicago	‡
Kansas screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 9/16 in. and larger, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb.	3.95
Steel bars, cents per lb.	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb.	3.00
Sheet iron, galvanized (24 gage), cents per lb.	3.85
Galvanized barbed wire, cents per lb.	3.20
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7–14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.6
White lead in oil (100 lb. keg), cents per lb.	13¾
Turpentine (bbl. lots), per gal.	$0.59
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.00
Rubber-covered wire, No. 14, per 1,000 ft.	$5.15-$5.20
Weatherproof wire base, cents per lb.	16.00

Paving Materials

Paving stone, granite, 5 in.	
New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	10.625
Light copper, cents per lb.	9.25
Heavy yellow brass, cents per lb	6.875
Zinc, old scrap, cents per lb.	3.875
Lead, cents per lb. (heavy)	5.375
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.25
Rails, (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.00

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 69 New York, Saturday, June 25, 1927 *Number* 26

San Francisco's Municipal Railway Bond Proposals to Be Resubmitted

RESULTS of the bond election on June 14 leave San Francisco in a peculiar position. As things stand the city is faced with the problem of a municipal railway tunnel and no money to run the railway through it, the same situation with respect to the Bernal cut, and no place to put Hetch Hetchy water when it arrives. The proposal for municipal railway extensions and additions involved the sum of $4,700,000. So far as the extensions are concerned, a part of them, particularly the Sunset-Judah line, are in the nature of a moral obligation. They were pledged at a time property was assessed for other improvements. The Sunset District paid $1,700,000 for the tunnel and felt that it was entitled to a promised rail extension.

Proponents of the measures defeated at the election say the defeat was due to the small vote. Their idea is to realign their forces so that the matters can be resubmitted at the regular municipal election in the fall. The reasons advanced for the defeat of the measures may or may not be correct, but it is in the record that they were defeated and that the city officials are confronted with the serious situation to which reference has been made. It does seem, however, that the citizens of San Francisco were particularly apathetic about a matter so important to some of them. Certainly the proposals were not without their vociferous adherents. The leader of these quite naturally was the *Examiner*. One of its flights of editorial fancy was headed "Muni Cars Have Created Miracles in New Wealth." That paper said that while the city of San Francisco had grown 57 per cent in assessed value since 1912, five residential districts opened and served by the municipal street cars had grown 267 per cent, or five times as fast as the average. There is no reason to quarrel with this as a statement of fact, but even allowing full credit to the railway for its part in the increase, the statement is over-sanguine in its implications. The burden of the paper's song was that the bonds for extending the municipal cars into Sunset Parkside, Excelsior and other "new" districts deserved to pass by an overwhelming majority. With this the people of San Francisco, or at least the voters who went to the polls, did not agree.

All through the agitation over the submission of the issue to the voters, the Market Street Railway, privately owned, appears to have devoted itself entirely to minding its own business. Its activities took no cognizance of playing politics. Bereft of anything else to say following the election, the *Examiner*, realizing its position to be extreme, warned its readers to watch for corporation moves, saying that the Market Street Railway may confidently be relied upon to open up some sort of a drive to get the use of the people's Duboce tunnel and Bernal cut as its private right-of-way. Moreover, that paper renewed its prophecy to the effect that the "Market Street Railway will try to lengthen and strengthen its tentacles upon San Francisco." All of which goes to show the extent to which the propagandist will go in trying to bedevil a situation in which the only desire of the one who stood by was to remain a silent spectator. It will be interesting to see what the people of San Francisco do when the matter is resubmitted to them in the fall.

Things that Are Too Cheap Are Costly

BEING a large consumer of oil and its by-products, the electric railway industry necessarily is vitally interested in the chaotic condition now existing in the oil industry, which has taken the form of a hysteria of over-production and an uneconomic variation of price. In common with other consumers, the electric railways are concerned with the question, where will this lead? In such a frame of mind, therefore, it would be well for the industry to study the analysis of the situation as recently made by E. W. Clark of Los Angeles, president of the American Petroleum Institute.

While claiming to possess no panacea, Mr. Clark in addressing 600 oil engineers and technologists at Colorado Springs has unearthed some salient facts that should clear the air considerably.

In pointing out the possible causes for the present situation, this authority stated that the system of oil production was not designed deliberately by any one. It is not some prearranged co-operative thing. In times past the industry was in much the same position as a man who stokes his furnace in hot weather, thereby violating both an economic and a physical law. Production has run around the industrial cycle because this lesson has not stuck and the industry has failed to check or limit its individual activities until so late that none of the operators seems at this time wise enough or powerful enough to stem the flood. Continuing further, we read that the more wells the industry drills at the same time, the greater the per barrel increase in the cost of the total oil recovered from the pool; second, that the more wells drilled at the same time, the more gas pressure is immediately released, thereby diminishing the total ultimate oil recovery because maintenance of gas pressure increases the rate of yield and the total amount obtainable, and, third, that the more wells that are drilled at the same time, the greater the likelihood of bringing to the surface a quantity of oil which will be forced on an over-supplied market at a price so low as to lead to wastefulness and disregard of essential values.

Overshadowing these elements of inefficiency and waste, it is learned that the present critical situation must not be considered merely in the terms of the Seminole, Earlsboro, Spindletop and Panhandle strikes, but from the greater perspective of the world's ultimate production. Russia, Venezuela, Colombia must be considered; also the great Persian Mesopotamian area of the middle East, all of which dwarf the significance of a few local and temporary phenomena of oil production here in the United States.

From these very candid admissions, we may deduce much that is helpful. The oil industry, in other words, has no standardized program. Apparently it is every man for himself and the devil take the hindmost. There has been such a wealth of production in this country that it has neglected the future staggering competition that is breeding in other countries. Over-production has, as is always the case, opened the gates for mushroom operators who, when production decreases, are generally forced out of the game, thereby leaving the large producers to fight a competitive battle.

With this last deduction we come to the crux of the situation in so far as it affects the electric railway industry. As an industry we have stood for one management in one area. This stand does not necessarily mean that we approve of a combination in restraint of trade; rather is it a combination to give better service. But on the other hand, indorsing single management that furnishes adequate service creates a reserve for improvements and in general protects the public as opposed to fly-by-night operators, inadequately financed, who in the end work to the detriment of those who consume their products. This situation is analogous, in so far as the industry is concerned, with oil and oil production. As consumers the railway industry, therefore, must subordinate its desire to buy cheaply to the sounder economic consideration of helping a big industry to stabilize prices and production that will result in uniformity and in the long run greater economy. It must stop looking through the wrong end of the telescope and remember that the things that are too cheap are costly.

Public Transportation Operators Must Lead in Solving Traffic Problem

WITH each sale of an automobile the traffic problem increases. While a few years ago it was only in the largest cities that traffic congestion was serious, today even modest hamlets have their crowded intersections, with officers directing the movement of vehicles. So serious has the problem become that public transportation, whether by street car or by bus, is seriously hampered. The organizations giving this service cannot sit quietly by and allow the civic authorities to handle the situation unaided. All too often city officials do not sense the real difficulty, and even when they do they are prone to heed the owner of the automobile in his claim for preferment as against the street car or bus.

A situation such as this demands that the street railway man, instead of drifting along with the current, become the leader in devising plans to ameliorate conditions. It is true that the transportation company will be the chief beneficiary. It is equally true that every resident of the community and every visitor to it will be the gainer if a solution is worked out that brings real relief. Petty jealousies and claims for preferment must be cast aside, and every proposal must be judged on its merits.

That much can be done in improving traffic conditions is indicated by the analysis presented by L. M. Traiser in this week's issue. The importance of an adequate traffic survey cannot be over-estimated. Only with complete information can the true requirements be determined, and only with the facts before them can those in control deal justly with the various elements. Such things as the use of intersections, the waste of time due to wrongly placed and wrongly operated signals and the evils of street parking can be taken from the realm of conjecture into the field of cold statistics.

As to the answer, it may differ in each community. There is a certain similarity, however, which makes it possible to lay down rules that must be followed to obtain real relief. Some of the elements are mentioned by Mr. Traiser, and there are many others with which the experienced traffic man is conversant. As in so many other features of transportation service, only co-operation will bring about the best results.

Showmanship May Be a Necessary Element

ON ANOTHER page of this issue is an account of the celebration staged by the Cincinnati, Hamilton & Dayton Railway to mark the completion of its rehabilitation program. There is no need to repeat here the features of that event, the most spectacular one being a bonfire in which the old cars were destroyed, but it is fitting that its significance be considered for a moment.

First, there is the fact that the management of the C., H. & D. was quick to recognize a good idea developed on another property and to apply it as a means of winning public interest and attention to the completion of a laudable rehabilitation program. Grand Rapids had shown the way. The C., H. & D. took up the idea and used it with attention to arrangements and details that reflected a ready grasp of the mechanism of showmanship. In the past the tendency has been too pronounced to deprecate rather than to utilize new ideas developed on other properties.

That this public celebration to mark the passing of the old facilities and the coming of the new succeeded at least in arousing great public interest was indicated by the thousands of automobiles that jammed for hours every approach to the bonfire, and by the good-natured multitudes that cheered and applauded every event on the program. There was no question left in the minds of observers but that the effort and money expended by the railway were repaid many-fold in good will and community-wide publicity. It was evident also that the success achieved was attributable largely to the meticulous care with which even minor details of the event were planned and the accuracy with which public reactions were anticipated.

What, then, does this signify? Surely there is something more in the C., H. & D. celebration and the results accomplished than merely that another railway held a public bonfire of its old cars. That something seems to be that there is another component in the little understood term "Merchandising Transportation." The industry is just beginning to understand some of the rudiments of salesmanship and of advertising. It is beginning to understand that the first step in merchandising anything is to make the product fit the public demand. Now there seems to be reason for concluding that "showmanship" may also have an important place in attracting public interest as a step in a merchandising program.

Remember, There's Always a Private to Wield the Marshal's Baton!

JUST as though belated recognition were denied it, democracy occasionally does something sensational which focuses the attention of all upon its exploits, deals a blow to the persiflage of the superior ones and wins new sympathizers to the "up from the ranks" theory. Such a condition has arisen following the awarding of 1927 commissions at West Point to two honor men who were appointed from the regular army to the academy, entrance to which was barred to enlisted men until a few years ago. The accomplishments of these two cadets prove that they are at least not inferior to the West Pointers, and it may prove that their former training was instrumental in their success.

"Up from the ranks" is a drama with good material on any stage. On the railway stage there are many supers and extras who could well take the lead if they were given the opportunity to show their latent talents. The disposition has been growing to take into greater account the unheralded employee who is up for a position of responsibility and trust, but the road to success will be traversed by many more willing feet only as this inclination to consider the possibility of men who constitute the rank and file becomes more and more pronounced.

In the railway field the desideratum is the right man in the right job. Often it is realized. There will be occasional misfits, but there will be fewer maladjustments when the managements consider enthusiasm and capacity for hard work attributes of the prospective promotee, for frequently linked with them is a talent waiting only development.

Stories of men who came "up from the ranks" in the railway business may be lacking in the sensationalism attached to the success of the honor men at West Point, but nevertheless they are pleasing parallels. These recitals of "career" men should serve as an inspiration to the employee still groping his way out of the ranks and as a corrective to that fallacious note in "up from the ranks."

Progress that Is the Result of Intelligent Work

SOME one has said that progress is the result of intelligent work; that there is no goal previously attained but what can be passed. These maxims have been splendidly substantiated by the exhibit committee of the American Electric Railway Association, which after 29 working days reports the sale of 105,402 sq.ft. of exhibit space for the next annual convention. This figure represents both progress and the fact that a previously attained goal has been passed. It represents, however, more than this when we view the committee's endeavors in the light of the industry as a whole. The very fact that there were at the close of business June 18 22 more applications than for the same period last year reveals a fine effort on the part of the manufacturing interest allied to the industry to place before operators all that is best and latest in the way of improvements. The increase in applicants also gives the lie to those who assert that the street car is doomed.

So much then is the result of 29 days of consistent, intelligent work, into which has been infused the infectious enthusiasm of the man who is the director of exhibits for the association. But this is only a beginning. There are several months ahead in which opportunity will be given those who have not yet applied for space to build on the foundation which the committee has so thoroughly prepared. It is to their interest to follow the example of more than 200 co-manufacturers whose abiding faith in the industry points a moral and adorns a tale. Their faith has been expressed in deeds, and their leadership should beget many followers.

Keeping Abreast of Public Demands Is an Endless Process

MONEY in ever-increasing quantities must be poured by the railways into plant and equipment needed to meet increasing public demands. There is nothing new in this to railway men, but there is a great deal that is new about it to the general public. And the railway misses an opportunity when it does not enlighten the public on this matter.

No annual statement worthy of the name but contains some tangible reference to the sums so spent. One that comes forcefully to mind, however, is the record of the Boston Elevated Railway in this respect. The expenditures for plant and equipment do mean something, and in the case of this company they have meant the sum of $33,570,000 in the last 8½ years of the public trusteeship. This money has been divided as follows: Cars and buses, $15,463,000; carhouses, shops and garages, $6,171,000; power houses and transmission of electricity, $4,117,000; surface lines (track and line betterment), $4,906,000; elevated structure and appurtenances, $2,013,000; miscellaneous improvements, $900,000. In addition to these sums, $3,434,000 had been expended upon road and equipment in excess of any capital issues at the time the trustees took charge of the railway on July 1, 1918, making the grand total to be provided for during the 8½ years of public control about $37,000,000.

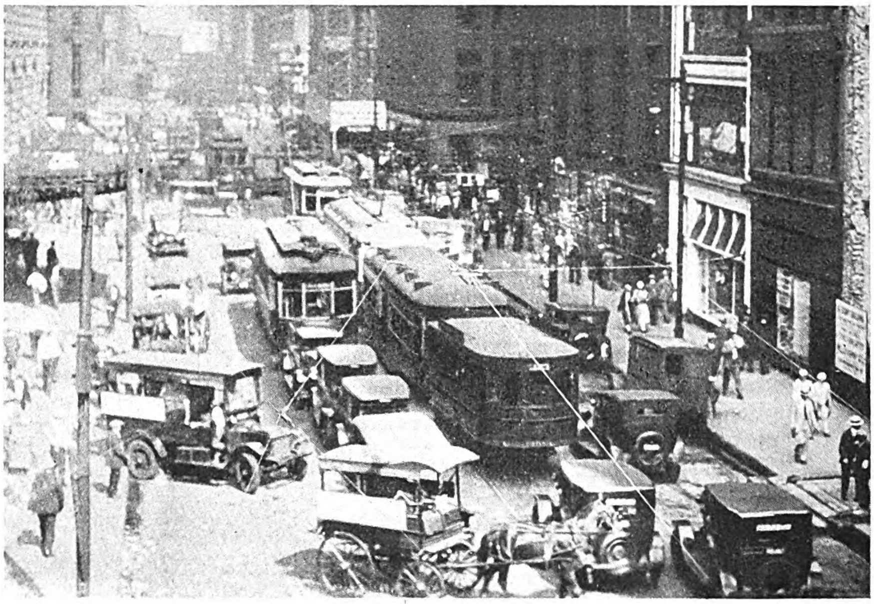
It is estimated that $18,856,000 of this was available from depreciation charges, but the rest had to be financed and it was no easy task. And the Boston Elevated hasn't overdone the thing by any means. Last year the system carried 6,000,000 more passengers than were carried in 1925. In all 2,385,255 more miles were run and 338,144 more round trips were operated. The number of bus-miles almost doubled. In its effort to keep abreast of its obligations replacement of the last wooden elevated cars, 100 in number, has been undertaken by an order for a similar number of modern steel cars. Eighty-one buses were added during the year to cover the lines on which bus operation had been started.

This, of course, is only one example, but the case is typical. On other roads it varies in degree but not in kind. Expenditures so made are an object lesson that may well be turned to account by electric railways everywhere. The power to influence of such figures is great when spread on the record, and the public cannot mistake their import in terms of increased service and added comfort. This increased service and this added comfort are not the public's inherent right. It is theirs only by virtue of their use of the service and their willingness to pay a fare that makes it possible to set up adequate depreciation reserves and to finance expansion that calls for the use of new money.

Railways Can Take Lead in Reducing Traffic Congestion

Reduction in cost of operation, increase in revenue and a better position in the community await leadership by electric railways. Intimate knowledge of the present situation, coupled with ability to make necessary engineering analysis, qualifies railway operators to aid solution of baffling community problem

By L. M. Traiser
Special Traffic Engineer Chicago Surface Lines



Mid-block turns on a busy street cause delay to all forms of traffic

RAPID increase in use of motor vehicles has produced a serious traffic situation in American cities. The opportunity which present street conditions offer to public transportation companies to reduce operating costs, increase revenue and build for themselves a better position in the community should induce railway operators to take an active part in helping their communities to work out measures for the relief of street traffic congestion. There is in the present traffic situation both a reason and an opportunity for railway executives to win a position of leadership.

Since every active person in a community must use the streets to carry on business or other activities, traffic dangers and delays are of common interest to all citizens. The cost of doing business, the expense of distribution and, as a result, the cost of living itself have been and are being increased by street traffic congestion. Street railways, earning practically all of their revenue on these streets, are particular sufferers in the form of increased operating costs and revenue losses. In serving their own interests, therefore, they are in the happy position of being able to help in the relief of a most serious and baffling community difficulty.

Traffic congestion not only delays car service directly and increases the cost of operation but it is also the cause of service interruptions caused by the breakdown of other vehicles using the tracks. In Chicago 30 per cent of all street car delays of five minutes or longer are caused by vehicles over which the company has no control. Thus participation in traffic relief work offers many benefits to railway managements.

RAILWAYS PROFIT THROUGH CO-OPERATION

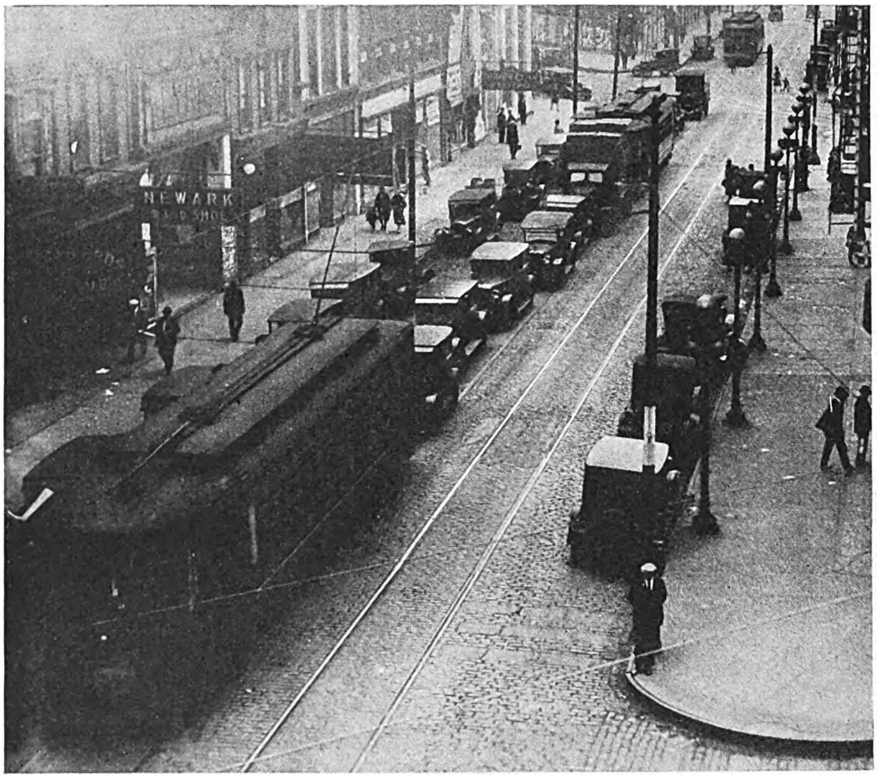
There are not only rising costs and service interruptions to combat but a genuine opportunity to improve the company's position in the community. Co-operation with municipal and civic groups opens to railway operators valuable contacts with leaders in business and civic life on a ground of common interest. Railway executives should be known for leadership. The street traffic situation in most cities offers to them the means of winning such recognition. City-wide knowledge of conditions on principal thoroughfares, in congested districts and at important intersections gives the railway management at once a broad view and authoritative data bearing on regulation and traffic control. Familiarity with traffic speeds, car headways and physical limitations of streets and districts are of great value to civic leaders in conducting intelligent traffic studies.

In working to expedite street car movement railway operators and their engineers have learned fundamentals which can be successfully applied to promote movement and reduce conflict of all street traffic. This intimate knowledge of the situation, coupled with experience which makes them expert in the conduct and analysis of traffic studies, may be profitably capitalized by railway operators.

TRAFFIC SURVEY ESSENTIAL TO INTELLIGENT CONTROL

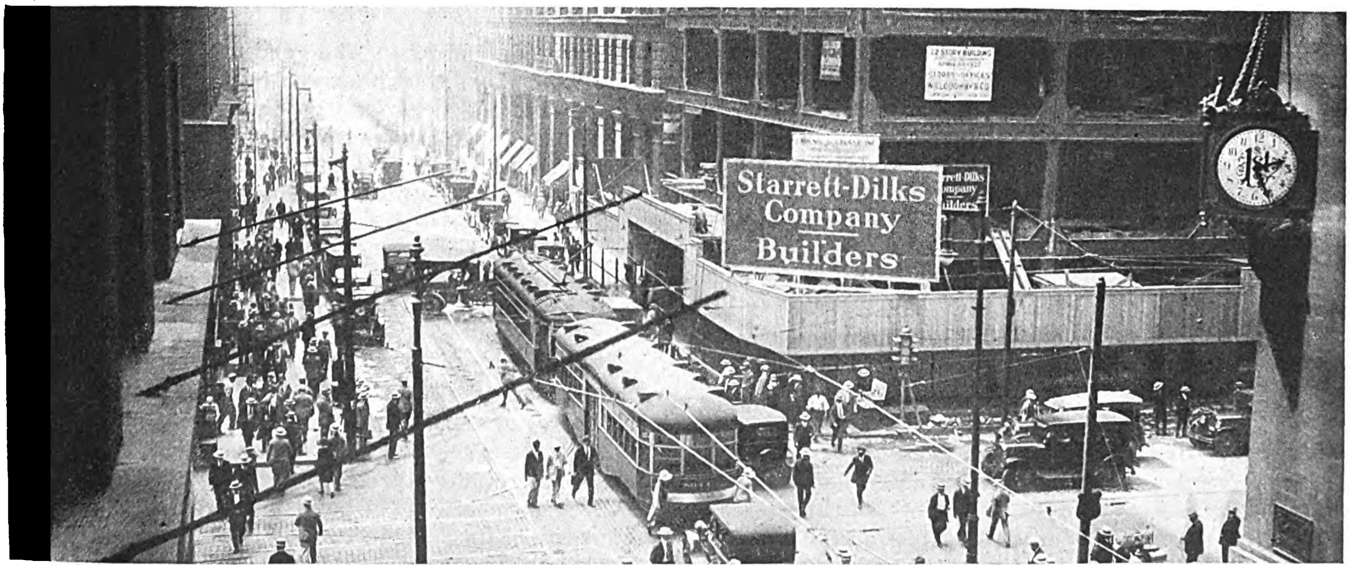
The purpose of traffic surveys should be to collect information and data with regard to the present situation and on this basis to determine means of using the existing street facilities more effectively. Of prime importance in this investigation is the collection and use of facts. Satisfactory traffic control cannot be built upon casual observation or guesswork.

The traffic survey should be city-wide. Congested streets are not limited to any one section. A comprehensive view of the entire community is needed for intelligent relief of congestion. Knowledge of volume and speed of traffic, types of vehicle used and flexibility of movement enjoyed are essential in the study of congested districts and intersections. To this should be added a study of the factors causing congestion. Foremost among these factors will be found: Growth in commercial activities; concentration of industrial and passenger traffic demands in given districts; physical limitations with regard to street space and traffic outlets.



Parking on narrow car line streets forces all traffic onto the tracks and delays car riders

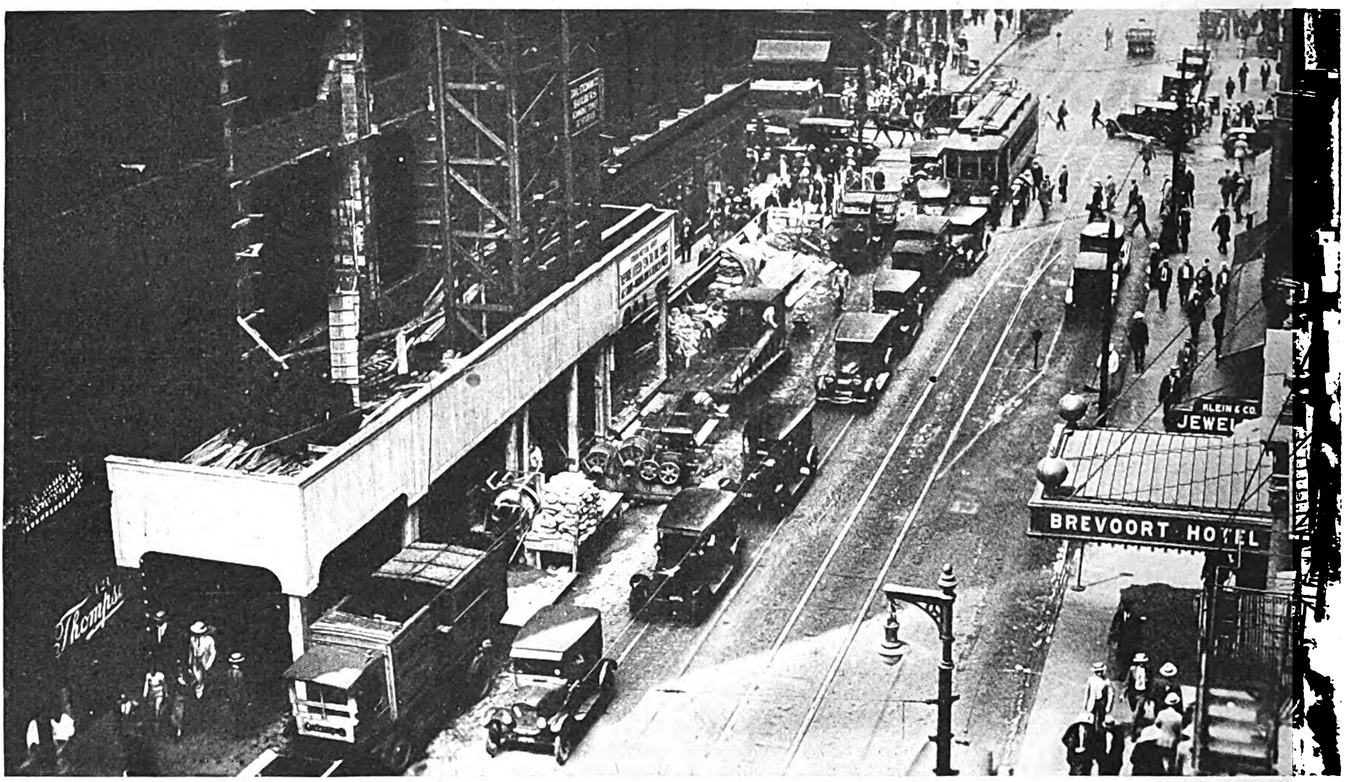
With this information known the second step is the application of this knowledge to bring about increased safety and convenience, while at the same time expediting traffic movement. Flexibility and convenience for the individual should be retained in so far as that is possible without serious delay to the major traffic movements. Investigation often shows, however, that unlimited flexibility and the conveniences represented by left turns, parking or turns within a block serve only a relatively small number of people at the expense of many who must use the streets. In such a situation the rights of the individual must give way to the needs of the community. The traffic regulation policy should be built on the principle of the greatest good to the greatest number.



Unloading building materials during heavy traffic hours is an example of street use which causes serious delay to traffic movement

A fundamental code of street use may be built up on this principle. It will have for its object the reduction of congestion and accidents through co-ordination of traffic movement to reduce friction and interference. This should be set down as a simple, enforceable code of regulations based on traffic requirements and street limitations.

The past five years have witnessed a tremendous increase in the use of traffic signals. Unfortunately, many installations have preceded proper studies of traffic volume and routes. Unnecessary and improperly timed traffic signals have been the result. Investigation of one installation on a heavy car line in Chicago exposed the fact that more than 20 per cent of the time was allotted to a movement of only 1/10 of 1 per cent of the passengers using the intersection. The time wasted by this signal in a single day was tremendous. Where a conflict of heavy traffic movements warrants the installation of signals to increase safety and flexibility they should be fitted to the intersection by a study of the particular traffic to be accommodated.



Use of important thoroughfares for the storage of building materials and hoisting apparatus is a serious obstacle to traffic which causes delay to thousands of people

Probably the greatest advantage of mechanical signal control comes in the progressive movement which can be brought about on heavy traffic streets or in congested districts. This progressive movement obtained with co-ordinated signal control has the obvious advantage over the present widely used synchronized control in that the time allotted to cross movement at each intersection may be in proportion to actual traffic demands at each intersection, instead, as is the case with the synchronized control, of being determined by the volume of traffic at the heaviest intersecting street. Progressive movement of traffic provides a high average speed and a definite check against high crest speeds that makes for safer and more orderly movement. Such a system, similar to one originally developed for the Loop district in Chicago, has been designed on Michigan Avenue to control traffic over 35 intersections covering a distance of more than 3 miles on this important thoroughfare. The installation displaces a synchronized system and is expected to improve materially the average speed and regularity of the traffic stream.

The co-ordinated control of heavy traffic at more than 45 intersections in the central business district of Chicago has been in successful operation for more than a year. In both this and the Michigan Boulevard improvement engineers of the Chicago Surface Lines suggested the method of control to be used and worked out the details of signal timing. Close co-operation in the work of improving conditions in the city has made the street railway one of the leaders in bringing about traffic relief in Chicago. The good will and public confidence which have thus been won insure continuation of the policy of co-operation that has been established. Thus the car rider is given proper consideration in the regulation of traffic and at the same time street conditions have been improved despite a constantly mounting traffic volume. There are situations in every city where better street traffic conditions will result from intelligent relief measures. In this work the street railway will do well to take an active part.

The city of Coral Gables, Coral Gables, Fla., through its engineering department, is drawing up plans for the building of a carhouse to house the cars of the rapid transit lines recently turned over to the city for operation. The carhouse will be built, if approved by the City Commission at its July meeting, in the industrial section in block 12. The construction will be of concrete block about 40 x 150 ft. E. Friedman, chief engineer for the city, is handling the plans.

German Road Makes Progress*

Proposed Rhenish-Westphalian high-speed line will have approximate length of 115 miles. The main line will serve nine cities and several branches are proposed

By W. Cauer
Director of Engineering, Professor at the Technical High School,
Berlin, Germany

DESIRE to give a high-speed connection between several of the principal industrial cities in the famous Ruhr district of Germany has led to plans for an electric railway that will provide frequent service with running time between the terminal cities about half that required by the State railway.

The project is not a new one. The first plan was made in 1904 for an interurban railroad from Cologne to Düsseldorf. The second project was for an interurban line between Düsseldorf and Dortmund. This project was worked out by order of a union of the towns in 1909 and provided for an electric line running on its own right-of-way and passing populated districts without entering the streets. The plan was rejected in 1911 by the Prussian Minister of Public Works as being an encroachment on the monopolized rights of the State railway, which would be able to cope with the traffic quite by itself by enlarging its existing system.

Due to the increased difficulties of handling passenger traffic after the war, all towns from Cologne to Dortmund combined again in 1920, in conjunction with the Rhenish-Westphalian Electric Company, to further a plan for an interurban railway from Cologne to Dortmund. In 1921 the State railway administration of Essen commented favorably on the plan of building a rapid transit railroad independent of the State railway system. By order of the town the Rhenish-Westphalian Electric Company worked out a preliminary plan, with the result that in 1922 the general preliminary design was submitted and a franchise to build the railroad was asked for. In January, 1924, the Prussian Government, with the consent of the German Empire, granted a 99-year concession for building and operating the rapid transit railroad system.

The time allowed for raising the joint capital stock and for the formation of the railroad company was two years. The main line plan was examined in detail. Estimates were made of building costs and the profits that could be expected. In view of the unfavorable economic conditions, an application was made for a three-year extension of the time limit to January, 1929, which was granted by the Prussian Board of Trade. The total capital required is 340,000,000 reichmarks.

The present plan covers a main line connecting the towns of Cologne, Düsseldorf, Duisburg, Mülheim, Essen, Gelsenkirchen, Bochum, Langendreer and Dortmund. A line between Duisburg and Essen by way of Oberhausen is also planned. Details of the branch line Duisburg-Hamborn-Dinslaken, Duisburg-Moers and Essen-Gladbeck are not yet settled, nor are the intermediate stations finally decided. The Essen-Gladbeck line will have to make a large number of stops as it has to compete against an existing tram line.

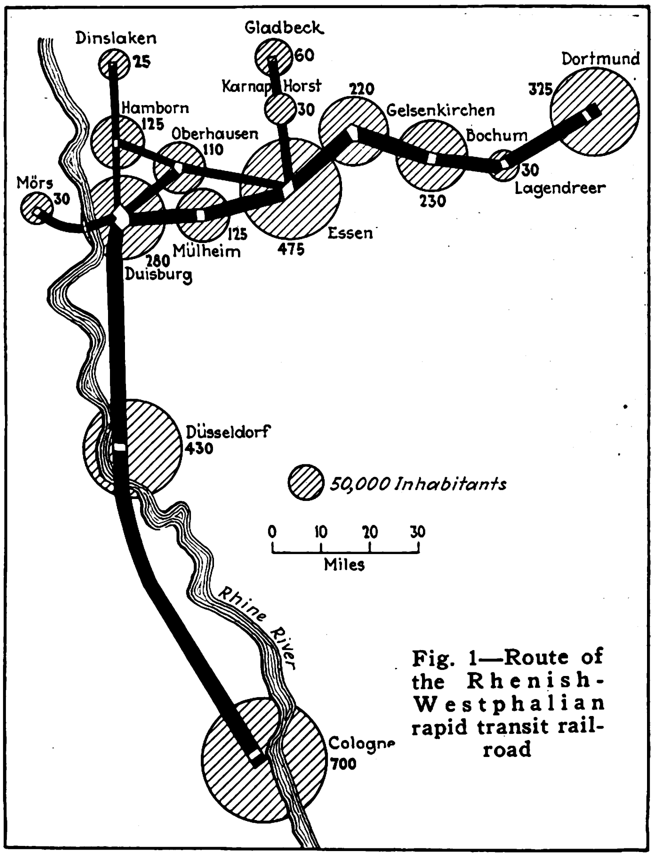


Fig. 1—Route of the Rhenish-Westphalian rapid transit railroad

All of the main line stations are placed in the business centers and, except in Düsseldorf and Bochum, the sites are close to the State railway stations. In general the stations are to be of simple design. At Duisburg, the junction of several lines, there will be a depot annex and a repair shop.

The main line will be built first. Between Cologne and Duisburg the maximum speed will be 81 m.p.h. and on the sections further east it will be 61 m.p.h. On the average, trips made will take only half the time neces-

PASSENGER CAPACITY OF TWO-CAR TRAIN ON NEW GERMAN HIGH-SPEED LINE

Car		Seats	Space for Standees	Total Passengers Each Class	Total Passengers In the Car
No. 1,	Third Class......	85	95	180	180
No. 2,	Third Class....	47	52	99	180
	Second Class...	33	48	81	180

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*This article is based on information contained in two articles published in *Verkehrstechnik* during 1926, supplemented by other information recently received by ELECTRIC RAILWAY JOURNAL from Mr. Cauer.

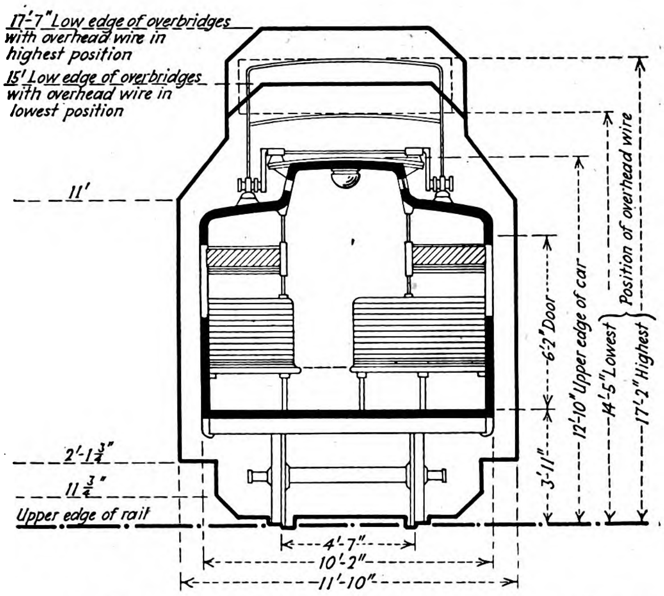

17'-7" Low edge of overbridges with overhead wire in highest position
15' Low edge of overbridges with overhead wire in lowest position
11'
2'-1¾"
11¾"
Upper edge of rail
4'-7"
10'-2"
11'-10"
3'-11"
6'-2" Door
12'-10" Upper edge of car
14'-5" Lowest
17'-2" Highest
Position of overhead wire

Fig. 2—Clearance diagram for the rapid transit railroad

sary to travel by the State railway. The whole journey from one end of the main line to the other will take less than 1½ hours. During off-peak periods trains will run at half-hourly intervals. This will be decreased considerably for rush-hour service.

To meet various traffic conditions long and short trains will alternate, spaced at varying headways. It is expected that service on branch lines will consist of short trains run at frequent intervals.

To provide a maximum schedule speed, all cars of a train will be motor cars. The shortest train is to consist of two cars. Each car will be 69 ft. 3 in. long, mounted on two trucks. The ends of the leading cars of a train are to be rounded to reduce wind resistance. Trains can be lengthened by adding intermediate cars with square ends up to a total of six cars. Stations and platforms are to be held in corresponding proportions. Each car will provide for a seated and standing load of about 200 passengers, according to the accompanying table. The power will be supplied to an overhead trolley at 1,500 volts direct current, transformed down from alternating current at 25,000 volts at substations and converted by means of mercury-arc rectifiers.

The track will be of modern heavy type, similar to that adopted by the State railway. Due to the high speed at which trains will run, all curves in the open country are to have a radius of not less than 3,280 ft. Fig. 2 shows a clearance diagram for the new line at the highest and lowest positions of the overhead wire. Fig. 4 gives a comparison between the rapid transit railroad clearance diagram at the lowest position of the overhead wire and the corresponding diagram of the State railway.

Crossing of roads and streets at grade will be avoided. In the open country the line will run as far as possible on embankments or through cuts. Inside towns it will be necessary to run underground.

In the Ruhr coal mining district lines must neither run through subways nor through tunnels, so the tracks will be elevated on an earth fill supported by retaining walls. Streets and plazas are to be crossed by bridges. All bridges within this area will be built with separate structures for each track so that it will be possible to repair tracks independently of each other.

The automatic block signal system adopted will employ three-position daylight signals which are visible even in foggy weather at great distances. Automatic safety stops will be provided to engage the brake mechanism if the train passes the signal in stop position. Besides this, at the approach to the terminals the train speeds will be reduced automatically. Other safety measures are provided by the use of three independent brake mechanisms. These are an air brake, a dynamic brake and a handbrake. If a motorman releases the dead man handle, an emergency brake application is automatically applied. Passengers also can stop the train by means of an emergency brake cord.

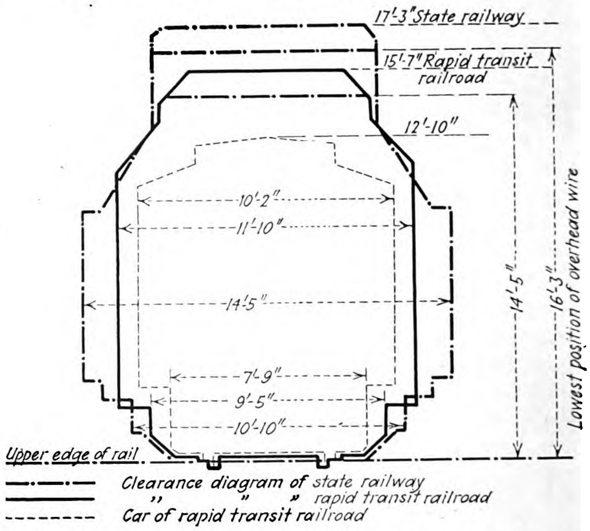

17'-3" State railway
15'-7" Rapid transit railroad
12'-10"
10'-2"
11'-10"
14'-5"
7'-9"
9'-5"
10'-10"
14'-5"
16'-3"
Lowest position of overhead wire
Upper edge of rail
Clearance diagram of state railway
" " " rapid transit railroad
Car of rapid transit railroad

Fig. 4—Comparison of clearance diagrams for the State railway and the rapid transit railroad

Plans for the branch lines are under consideration.

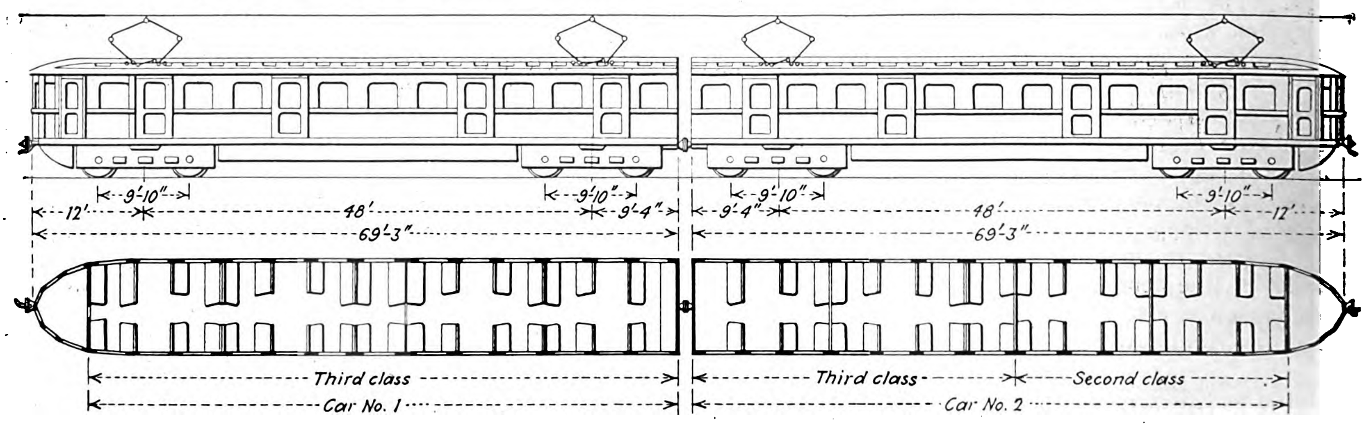
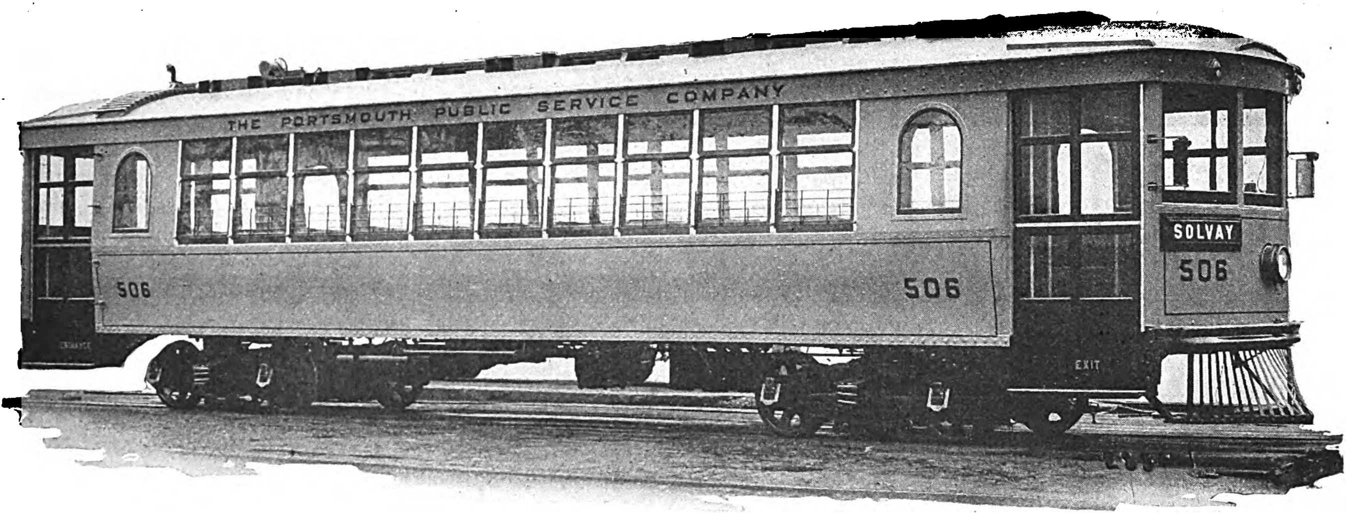

9'-10"
12'
48'
9'-4"
69'-3"
9'-10"
9'-4"
9'-4"
9'-10"
48'
69'-3"
9'-10"
9'-10"
12'
Third class
Car No. 1
Third class
Second class
Car No. 2

Fig. 3—Two-car train provides second and third class sections



New cars of this type have been of great advantage in holding the revenue of the rail lines in Portsmouth, Ohio

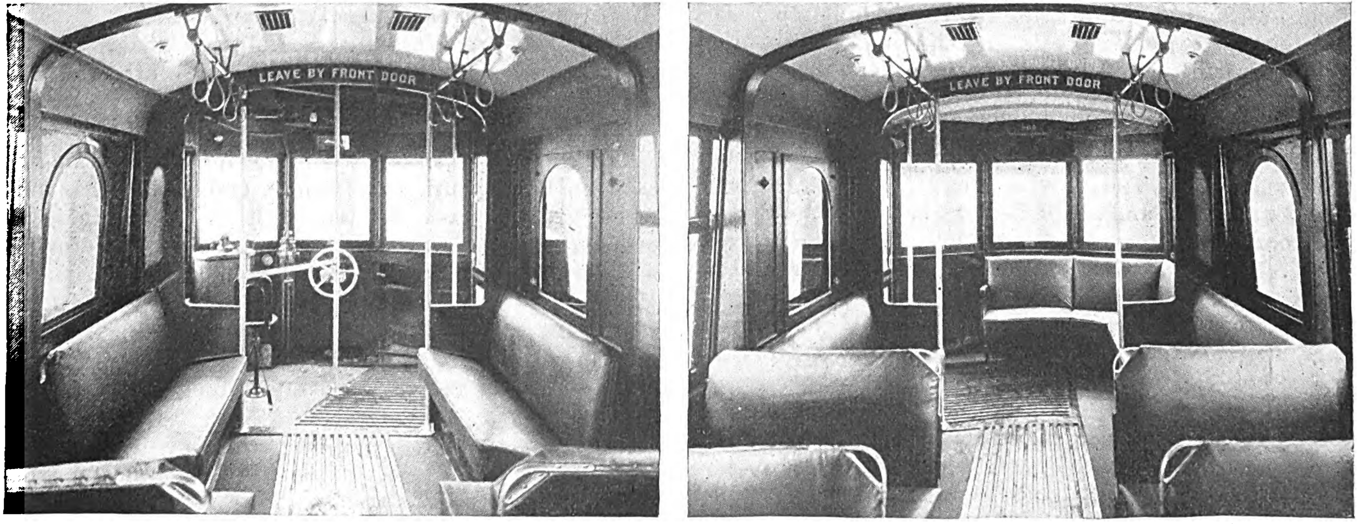
Co-ordination in Portsmouth, Ohio

Modern cars and buses have increased the total revenue of the Portsmouth Public Service Company in the face of automobile and independent bus competition

MEETING modern conditions in a city of 50,000 population is a matter of considerable difficulty. The automobile has made so many inroads on revenue that even the most-talked-of plans have to be worked out with care to accomplish the salvage of the transportation property. Conditions in Portsmouth, Ohio, during the past several years have been similar to those in many cities of like size. With the use of new cars designed to meet the conditions of today, supplemented by bus service where it can be effective, the Portsmouth Public Service Company has been able not only to remain in operation but actually to increase the number of riders on its lines.

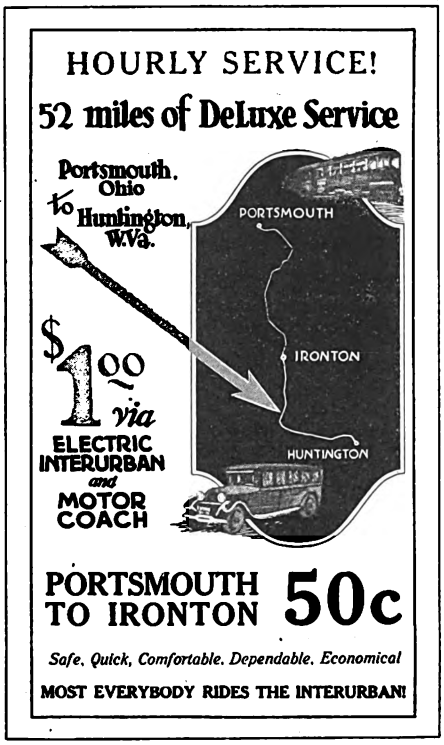
The company began modernization of its equipment in June, 1920, when six cars built by the Cincinnati Car Company were placed in service on one of the heaviest routes in the city. Three more of the same general type were installed in February and March, 1924. These nine cars give about 80 per cent of the local service, which takes altogether twenty city cars. A total of 1,580 car-miles per day was operated in 1926, at an average cost of about 39 cents per car-mile for all types of equipment.

The management is well pleased with the cars. They are light and have sufficient motor capacity so that they accelerate and retard quickly. Tests show that they are economical of power. The route is approximately 11 miles long, with light grades and good operating conditions. The tracks are on the heaviest traffic streets of the city.



The cars have a pleasing interior. At left, looking toward the front; at right, a curved seat gives comfortable accommodations in the rear of the car

The city railway service is now augmented by bus lines, as shown on the accompanying map. The first of these lines was started on Nov. 1, 1925. Bus service was inaugurated originally to care for a number of outlying residential districts that were not served adequately but did not have sufficient population to warrant the construction of car lines. At first two bus lines with a total length of about 5 route-miles were run into the northern part of the city. Following discussions with city officials during 1926, railway service was discontinued on the Sixth Street car line, consisting of about 1.83 miles, and on the Seventeenth Street line, about 1.84 miles, a total of about 3.67 miles of track, and bus service was started as a substitute.


HOURLY SERVICE!

52 miles of DeLuxe Service

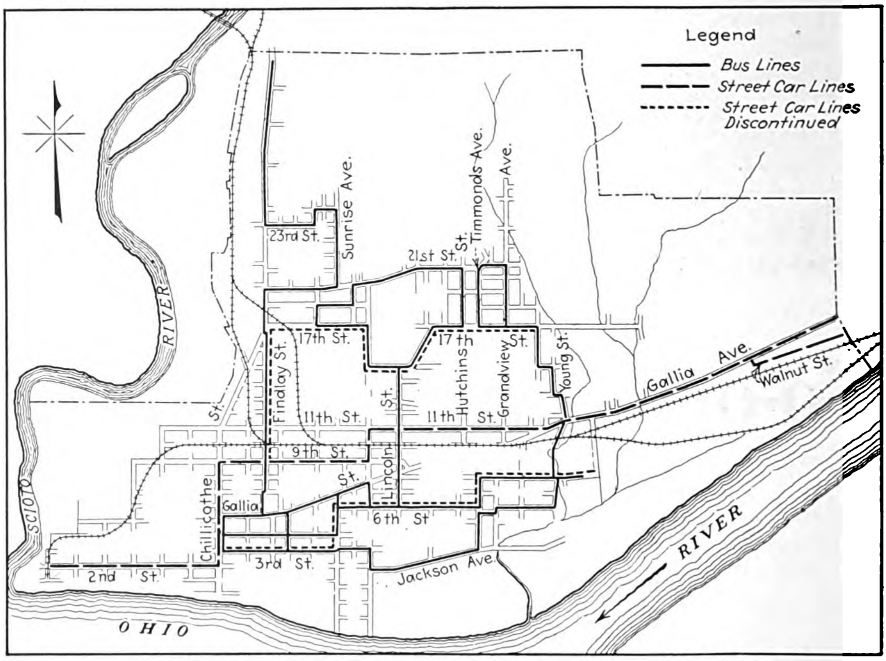
Portsmouth, Ohio to Huntington, W.Va.

$1.00 via ELECTRIC INTERURBAN and MOTOR COACH

PORTSMOUTH TO IRONTON 50c

Safe, Quick, Comfortable, Dependable, Economical

MOST EVERYBODY RIDES THE INTERURBAN!
PORTSMOUTH
IRONTON
HUNTINGTON



Above—Bus routes have been used to replace some unprofitable car lines in Portsmouth, Ohio. At left—Placard advertising interurban service to Huntington, W. Va.

The buses do not run exactly over the former street car routes, as may be seen from the map. The total length of the bus routes today constitutes about 9.5 miles.

The regular schedule calls for half-hourly service on each bus route, with a total of 688 bus-miles per day. The city railway service is on ten-minute headway in the base hours, with five-minute headways in the rush.

The cash fare is 10 cents, with five tickets for 35 cents and 60 tickets for $3. The average fare is slightly under 7 cents. In 1921 the railway passengers per day averaged 9,100. Today, with greatly increased automobile competition and a number of bus lines operated by the company, the average is 8,200. According to company officials, the decrease would have been much greater had it not been for the installation of the new cars.

The fare on the buses is the same as that on the cars, the same tickets being used. Free transfers are issued between all lines, both car and bus. The average number of bus passengers daily is 2,700, so that the total riding of the system, 10,900 per day, is considerably more than it was in 1921, prior to the introduction of the new cars and the buses.

There is an agreement between the company and the city that the street car lines will not be abandoned permanently, but are only discontinued. The rails and overhead are retained in position, so that rail service can be resumed at any time it is mutually agreed between the city and company to do so.

Besides the city service, the company operates a bus line from Portsmouth to Wheelersburg, a town of some 500 inhabitants at a distance of 10 miles. The route runs over the main highway between Portsmouth and Ironton as far as Wheelersburg and it averages 277 bus-miles per day on an hourly headway and carries an average of over 1,300 passengers daily. Two buses are used to fill the schedule, averaging fourteen trips a day.

Fares are collected on the zone system. There are four zones, the fares charged being the same as those on the city lines, with the exception that the cash fare is 10 cents in the first zone and 5 cents in succeeding zones, or 25 cents cash for the entire distance. Cleveland locked fare boxes are used on these buses and on the city cars, while Ohmer registers are used on the city buses and on the interurban cars.

The buses are Whites with Kulhman bodies and all of them are equipped with Westinghouse air brakes.

INTERURBAN MEETS BUS COMPETITION

The company operates a 30-mile interurban rail line between Portsmouth and Ironton, Ohio, which has suffered greatly from bus competition. The line was projected in 1902, and was built as far as Sciotoville, now within the city limits of Portsmouth, in 1903. It was extended to Ironton and service was begun in 1916. The cars run every hour on the hour from Portsmouth, the time being one hour 18 minutes. After a four-minute layover the cars leave Ironton at 22 minutes past the hour.

There are two competing bus lines, one of them running half-hourly service between Portsmouth and Ironton. These two lines were cutting seriously into the revenues of the interurban, reducing the net earnings of the company accordingly. As a remedy it was decided to make a cut in fares and the rate was reduced from 90 cents to 75 cents. This was followed by a 60 per cent increase in gross revenue. The result was so satisfactory that a further cut to 50 cents was decided on. This produced another increase in gross business of 23 per cent.

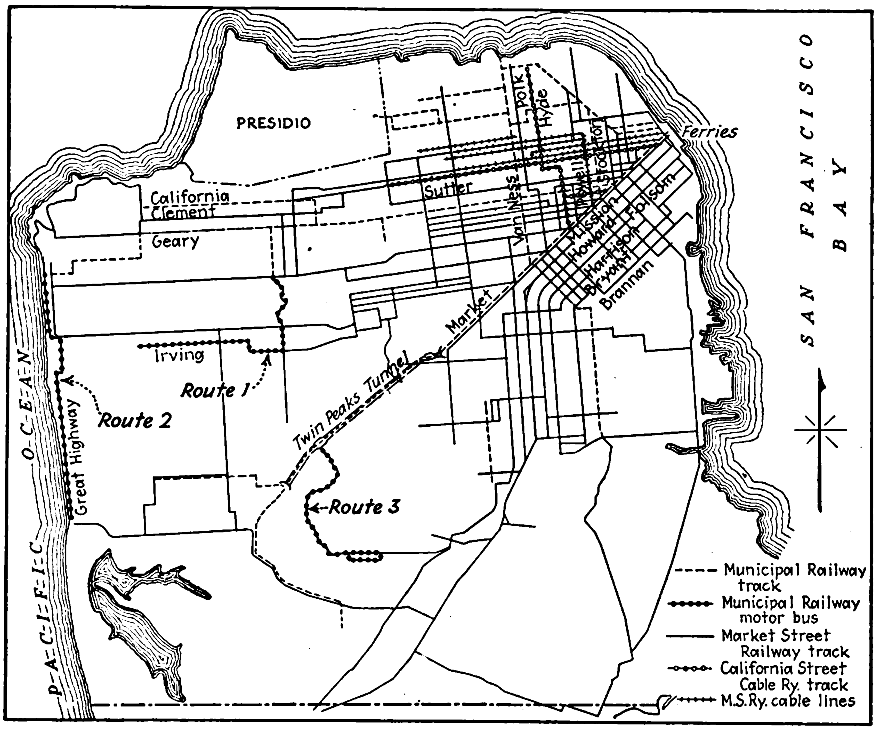
Prior to the reduction in fares, the bus lines had been carrying more passengers than the railway. Traffic checks taken at various points before and after the change showed that conditions were reversed following the reduction. The shift in riding was not confined to any one class, but affected both long haul and short haul in about the same proportion. The checks showed that the bus competitors are now working at a load factor which precludes any possibility of profit.

By co-ordinating with the Ohio Valley Bus company, a through service is rendered between Portsmouth and Huntington, W. Va., the buses furnishing the transportation between the latter city and Ironton, a distance of 22 miles. Schedules are co-ordinated so that close connections are made at Ironton. One of the advertising placards reproduced herewith shows how the through service has been featured. Combined with the low fare on the interurban, this joint service has been a material element in reducing competition.

Buses Operated in Feeder Service

Municipal Railway of San Francisco is using buses to augment rail lines in several districts where extension of tracks would not be justified

FEEDER and extension bus service is operated by the Municipal Railway of San Francisco to tap sections of the city unserved by rail lines of either the Municipal Railway or the Market Street Railway. Such service, however, is co-ordinated with the Municipal Railway and in no way competes with it or the Market Street Railway. Because of the very nature of the routes covered by the buses, the operation as a whole showed for last year a net loss amounting to approximately 7 cents per bus-mile. This loss is not viewed with any degree of concern by the management, because additions have been made to original bus routes so that they now render transportation service far in advance of the requirements. Moreover, bus operation serves as an indication of the need for transportation in a section of the city, and even now it is planned to replace a portion of one of the bus routes with rail service.



Bus routes of the Municipal Railway of San Francisco traverse sections of the city unserved by rail lines of either the Municipal Railway or the Market Street Railway

Three bus routes are operated, requiring thirteen buses. During the fiscal year ended June 30, 1926, the passenger revenue derived from these three routes amounted to $53,467. In addition to the passenger revenue obtained directly by the bus operation, a credit of 2½ cents is made on transfers originating on the street cars. This, together with school tickets and other revenue credits, amounted to $19,432, which brought the total passenger revenue and credits for the year up to $72,899. The operating expenses for the 449,886 bus-miles operated amounted to $105,945, resulting in a net loss for the year of $33,046, or 7.35 cents per bus-mile operated.

Bus service can be divided into two classes. First, feeders to the rail lines and, second, local or sightseeing routes along the Great Highway adjacent to the beach and amusement resorts. Under the first classification are routes Nos. 1 and 3, the former producing a direct passenger revenue of $27,691, constituting the most profitable of the bus lines, a portion of which is to be replaced by a rail line. Under the second classification is route No. 2, whose operation resulted in a passenger revenue of $20,836 for the year. This route, located as it is at western terminals of lines of both the Municipal Railway and the Market Street Railway, and covering the entire length of the beach for a distance of 2.75 miles, renders a local service in addition to feeding the rail lines. On Sundays and holidays the amount of local service requires five buses operating on approxi-

TABLE I—STATISTICS OF BUS ROUTES OPERATED BY THE MUNICIPAL RAILWAY OF SAN FRANCISCO

Route	Route Miles	Headway, Minutes Base	Headway, Minutes Rush	Buses Base	Buses Rush
1. Tenth Avenue and Fulton to 35th Avenue and Irving, through Golden Gate Park	2.67	7½	6	4	5
2. Great Highway, Cabrillo to Sloat Boulevard (Weekdays)	2.75	15	..	2	..
(Sundays)		7½	..	4	..
3. Monterey Boulevard	2.06	15	..	2	..

TABLE II—BUS LINE OPERATIONS OF MUNICIPAL RAILWAY OF SAN FRANCISCO, NOVEMBER, 1926

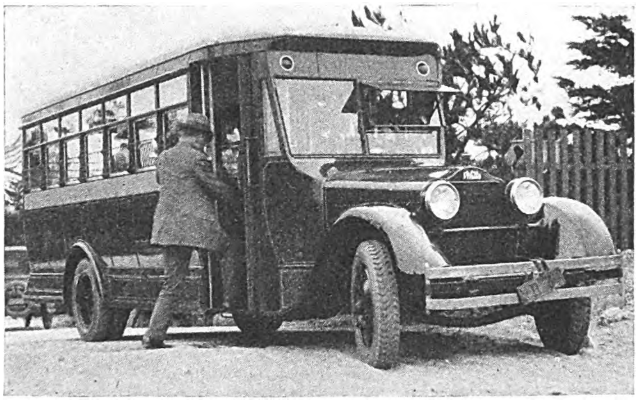
Receipts				
Route No. 1 (Tenth Avenue and Fulton to 35th Avenue and Irving)		$2,296.10		
Route No. 2 (Great Highway, Cabrillo to Sloat Boulevard)		1,275.10		
Route No. 3 (Monterey Boulevard Route)		807.65		
			$4,378.85	
Operating Expenses				
Group II.—Equipment				
Acct. No.				
39 A–Bus engines, labor and material	$823.96			
39 C–Chassis	370.54			
39 D–Tires, including repairs	882.90			
39 E–Bus body repairs	111.20			
39 F–Labor and material bus repairs due to collisions	4.21			
39 G–Transmission, labor and material, buses	187.93			
39 H–Brake work, labor and material, buses	161.53			
Total Group II		$2,542.27		
Group IV. Conducting Transportation				
78 A–Gasoline, buses	$1,067.81			
78 B–Oil, buses	154.38			
78 C–Conductor-chauffeurs, buses	3,461.40			
78 D–Greasing and servicing, buses	696.93			
78 E–Cleaning and washing, buses	172.89			
Total Group IV		5,553.41		
Group VI. General and Miscellaneous				
88 A–Pension costs, buses	$160.00			
89 A–Administration, buses	50.00			
89 B–Insurance, buses	987.50			
Total Group VI		1,197.50		
Total operating expense			$9,293.18	
Operating loss				$4,914.33
Fixed charges				
Accrued depreciation, 41,146 miles at 2 cents a mile	$822.92			
Interest on investment	245.55			
Garage rental	250.00			
Account No. 215, pro rate of taxes	21.67			
Total fixed charges				1,340.14
Gross excess of expenses over receipts				$6,254.47
Revenue Credits				
6 Q.M. tickets at 5 cents	0.30			
4,935 School tickets at 2½ cents	123.38			
66,092 Local transfers at 2½ cents	1,652.30			
Total revenue credits				1,775.98
Net loss				$4,478.49
Average net loss per day				$149.23

BUS MILEAGE—41.146 MILES. ITEMIZED COST PER MILE

Acct. No.		Acct. No.	
39 A-Bus engines, labor and material	$0.0200	78 C-Conductor-chauffeurs, buses	$0.0841
39 C-Chassis	.0090	78 D-Greasing and servicing, buses	.0169
39 D-Bus tires, including repairs	.0214	78 E-Cleaning and washing, buses	.0042
39 E-Bus body repairs	.0027	88 A-Pension costs, buses	.0039
39 F-Labor and material, bus repairs due to collisions	.0001	89 A-Administration	.0012
39 G-Transmission, labor and material, buses	.0047	89 B-Insurance, buses	.0240
39 H-Brake work, labor and material, buses	.0039	Garage rental	.0061
8 A-Gasoline, buses	.0260	215 -Pro rate of taxes	.0005
78 B-Oil	.0037	Depreciation	.0200
		Interest on investment	.0060
		Total expenses	$0.2584
Receipts per bus-mile (revenue credit not included)			$0.1064
Revenue per bus-mile (revenue credit included)			.1496
Total expenses per bus-mile			.2584
Net loss per bus-mile			$0.1088

mately a seven-minute headway, and at times the traffic becomes so heavy that no reasonable amount of equipment could handle it. On week days, however, the traffic is light, requiring two buses to give a fifteen-minute service. On Sundays and holidays a revenue as high as $160 is obtained from this operation.

Routes and service of the Municipal Railway bus operation are given in Table I.



Buses of the street car type are used by the Municipal Railway in both feeder and extension service to its railway lines

A statement of the bus line operations for the month of November, 1926, is given herewith. This indicates the method used by the Municipal Railway for setting up the itemized cost per mile for bus operation.

Depreciation on the bus equipment is figured at 2 cents per bus-mile. This is an average figured over the entire equipment, which includes some old buses that have operated in the neighborhood of 300,000 miles and are still used in tripper and extra service. The rate of depreciation is changed monthly so that a fair balance is reached in order to write off the equipment as it wears out.

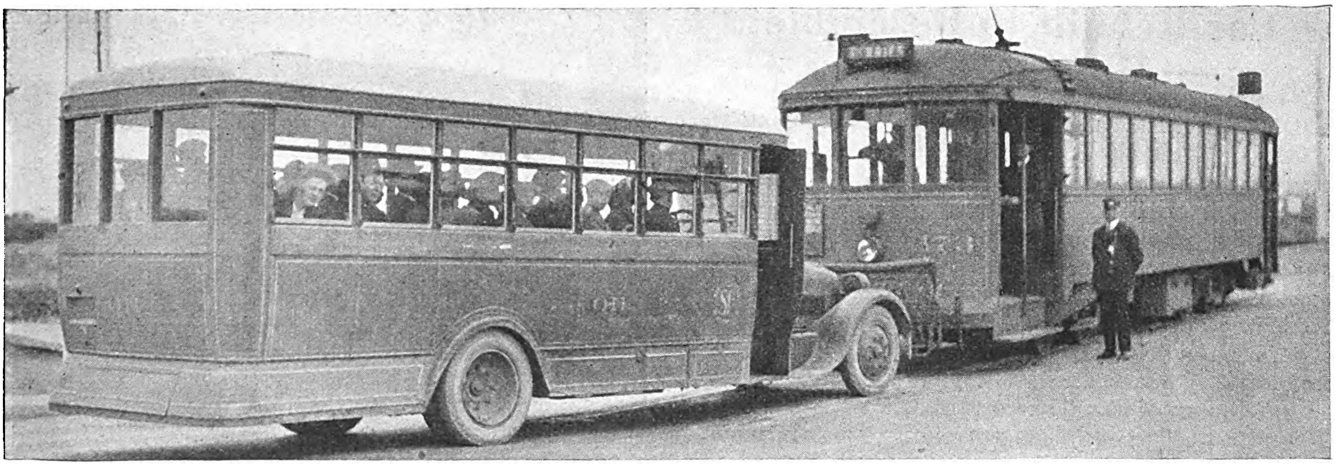
The detailed description of the bus equipment is given in Table II.

The ten buses purchased by the city are of several types, although all are of White manufacture. All are pay-as-you-enter. There are five TDS buses, weighing 7,800 lb. each, and seating eighteen passengers; two type 20-45 of the same capacity and weight, and three type 50-a, weighing about 10,000 lb. each and seating 25 passengers.

In addition the railway operates three Pierce-Arrow 29-passenger buses which were donated by a community and which are carried in the capital account under contributed surplus at $24,000. The operating expenses, however, are included in the general statement.

Many requests have been made for municipal bus line service connecting with the street cars, and recommendations have been made by M. M. O'Shaughnessy, city engineer, to inaugurate service on five new routes, St. Francis Wood, Balboa Terrace, Westwood Highlands, Westwood Park and the westerly portion of the Sunnyside Tract. All are closely built up portions of the city and are somewhat remote from street railway lines. The contour of the ground is such as to make it costly to construct and operate a street railway, although a bus easily could be operated to connect with the railway. A petition for this bus line signed by 600 residents of these districts was recently presented to the municipal authorities. The proposed route is 1.25 miles long. To provide service for this route an expenditure of $40,000 for equipment would be required.

For almost ten years the matter of transportation for the Potrero Hill District has been under consideration. A new street between Rhode Island and Carolina



Buses operated by the Municipal Railway of San Francisco meet rail cars at the line terminals and carry passengers into sections of the city not otherwise served

Streets is now under construction, and when this is completed a bus line connecting with the Potrero Avenue car line of the Municipal Railway is proposed to operate over Seventeenth, San Bruno, Vermont, Twentieth, Twenty-second, and Wisconsin Streets, to 23d Street. The length of this line would be 1.10 miles, and the cost of equipment is estimated at $30,000.

Another recommendation of the city engineer concerns bus service around the waterfront. The length of such a line would be 3.25 miles. The cost of the equipment necessary for its operation would be $60,000. In Lincoln Park the Legion of Honor Building has recently been opened. No direct car service is within easy reach of this building, which is being daily visited by many people. Service would be given by a bus line operating from 33d Avenue and Geary Street, via 34th Avenue and Lincoln Park. The length of this line would be 0.6 mile, the cost of the equipment $10,000.

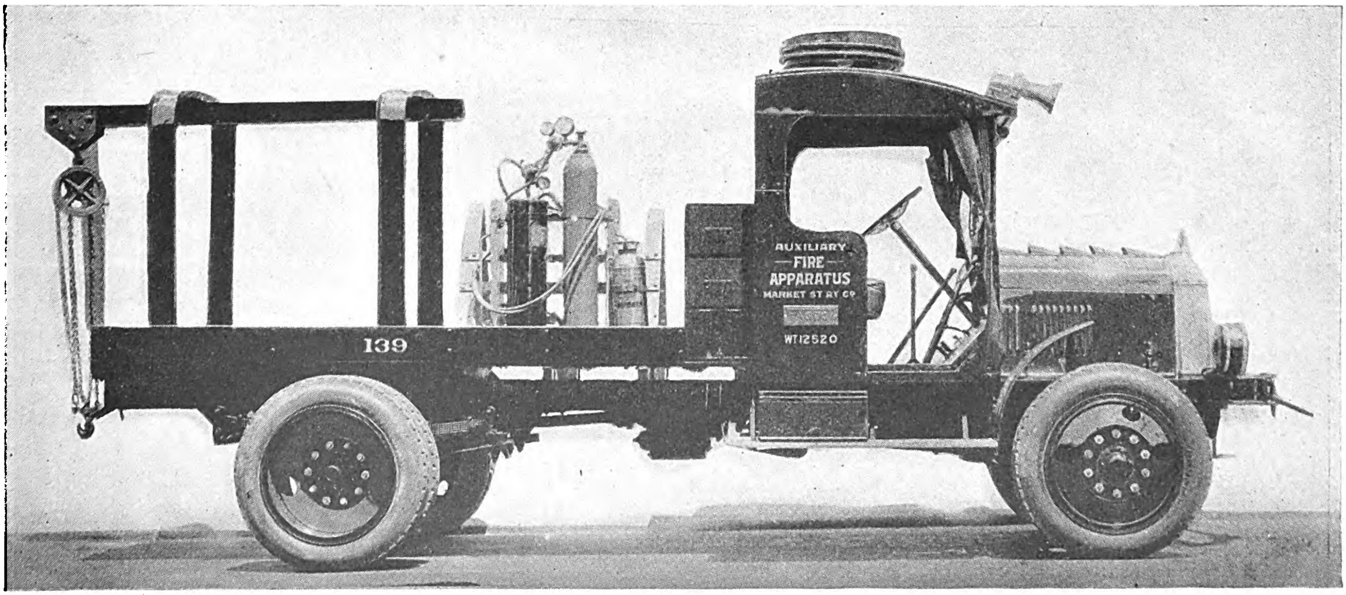
At the present time the vast area lying between Bruno Avenue and Mission Street is without any form of transportation. After the completion of the Excelsior District railway line, as now planned, a bus line would be operated over Silver Avenue from Mission Street to San Bruno Avenue. Its length would be 1.47 miles and the cost of equipment would be $30,000.

Railway Operates Auxiliary Fire Apparatus

VALUABLE service is being given by an auxiliary fire truck built in the shops of the Market Street Railway, San Francisco. It is housed at the Ferry Building and is always on call. Assistance is rendered to the city's Fire Department from time to time. It is equipped with a fire siren and is given the right of way over ordinary street traffic.

From time to time stalled trucks are towed out of the vehicular tunnel, which extends across the foot of Market Street near the ferries. For this purpose the truck is equipped with two drawbars, one at the front and the other at the rear, enabling it to hitch at either end onto a disabled vehicle. The truck also carries a specially built acetylene torch outfit capable of cutting through heavy girders in a few minutes. On the right-hand side of the body is a towing dolly. Over the driver's compartment is a spare tire. Other equipment carried includes fire extinguishers, wire rope, blocks, jacks, etc.

At the rear is a chain hoist capable of lifting a heavy truck. The body is mounted on a Fageol chassis equipped with pneumatic tires.



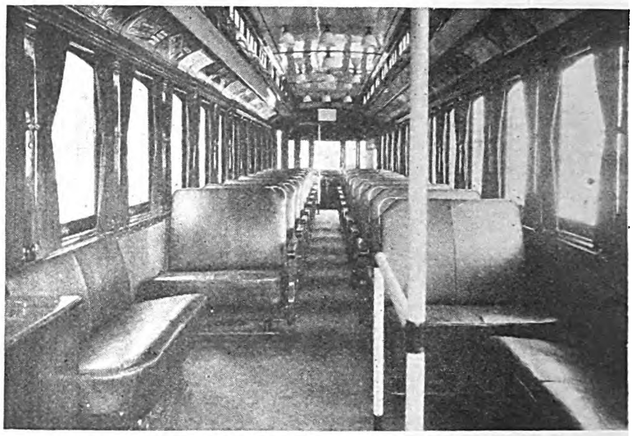
Emergency truck operated by the Market Street Railway of San Francisco is equipped for fire-fighting and wrecking activities

Car Rebuilt to Resemble Motor Coach

CONFRONTED with the problem of increasing the through riding on the 14-mile interurban line operating between New Bedford and Fall River, the Union Street Railway, New Bedford, Mass., recently remodeled a passenger car to resemble a bus. This company has for some time supplied duplicate service between the two cities, as its New Bedford-Fall River-Providence bus route parallels the electric railway line between New Bedford and Fall River. Each class of service has a 30-minute headway, the car making the run in 60 minutes at a 30-cent fare, while the bus takes 45 minutes, collecting a 50-cent fare. The car makes suburban stops en route, while the bus operates express service from city to city. Because a considerable number of passengers seem to prefer the trolley to the bus, it was thought advisable to encourage this class of patronage by operating a de luxe passenger car.

The modern motor coach was used as a model for the interior finish of the de luxe car and it was found that the car presented even more opportunity for finished workmanship than does the motor coach. The existing electrical and mechanical equipment was found to be in excellent condition, making it possible to rebuild the car at a cost of 10 per cent that of new equipment.

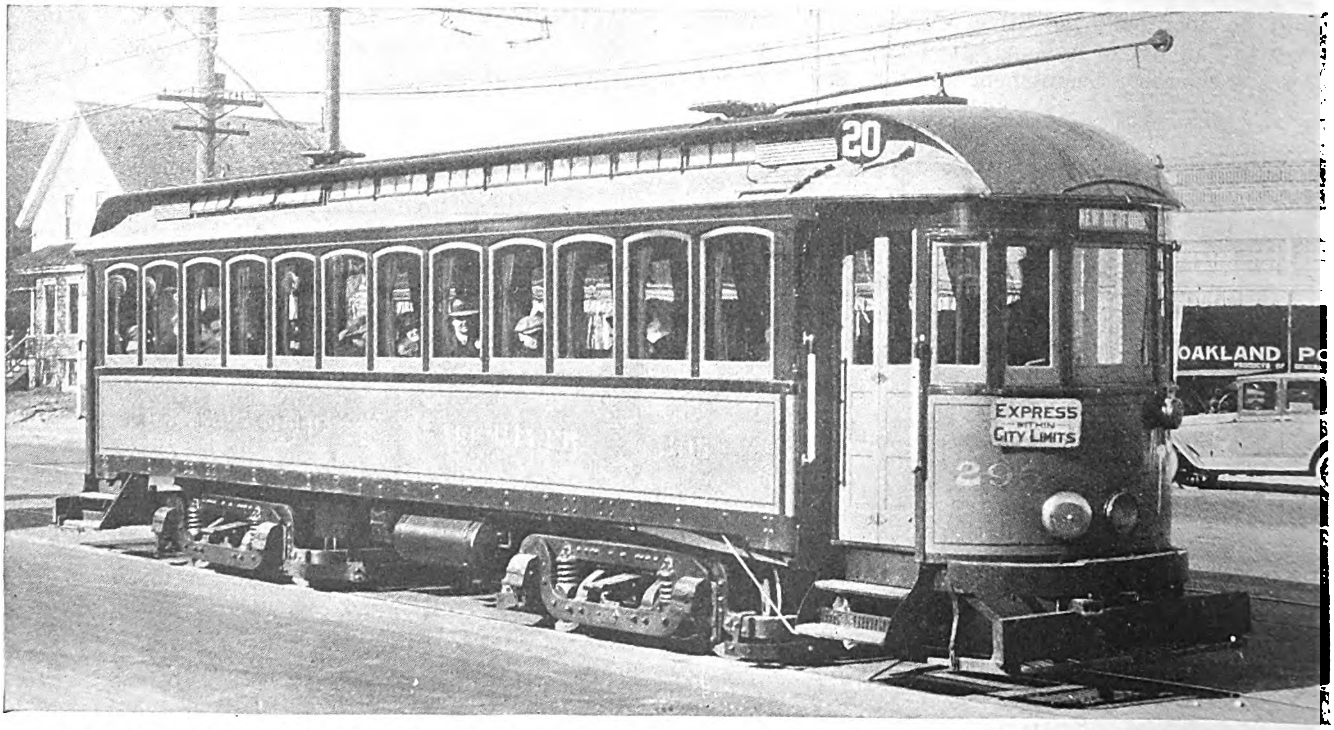
Exterior colorings were changed from Pullman green with gold lettering and striping to a tan and brown coloring (Mojave gray and London smoke) with gold lettering and orange striping. Exterior wooden grab handles were replaced by steel pipes, covered with white enamel. Vestibule doors were installed. To give an unobstructed view ahead, the bulkheads at either end of the car were removed and the platforms of the car finished attractively. Battleship linoleum was laid over the old wood floors. Side walls under the windows were covered with a heavy gray tapestry, similar to that customarily used in modern motor coaches. The ordinary street car window curtains were replaced by drapery curtains, held in place by horizontal nickel-plated rods and tie-back snaps. Natural finish ceilings were changed to white enamel with gold striping.



The interior has been refitted along the lines of current automotive practice

Reversible seats are required on this line on account of double-end operation. The seating capacity was not changed, but the rattan covered seats were replaced by air cushion seats, covered with heavy brown leather. Rearrangement of the seats made it possible to build sand boxes in the corners of the car, thus eliminating the necessity of removing a seat top in order to replenish the supply of sand. The lighting system was not changed, although 56-watt lamps replaced 23-watt lamps. The monitor window glasses were changed from amber to white frosted glass, so as to harmonize with the white enameled ceilings.

Only one car has been rebuilt. The success or failure of this piece of equipment will probably aid in determining further developments. The car has not been in service long enough to determine definitely what results will be obtained. A good indication of its popularity is that the company information office is continually asked by patrons what time they will be able to ride on "the de luxe car."



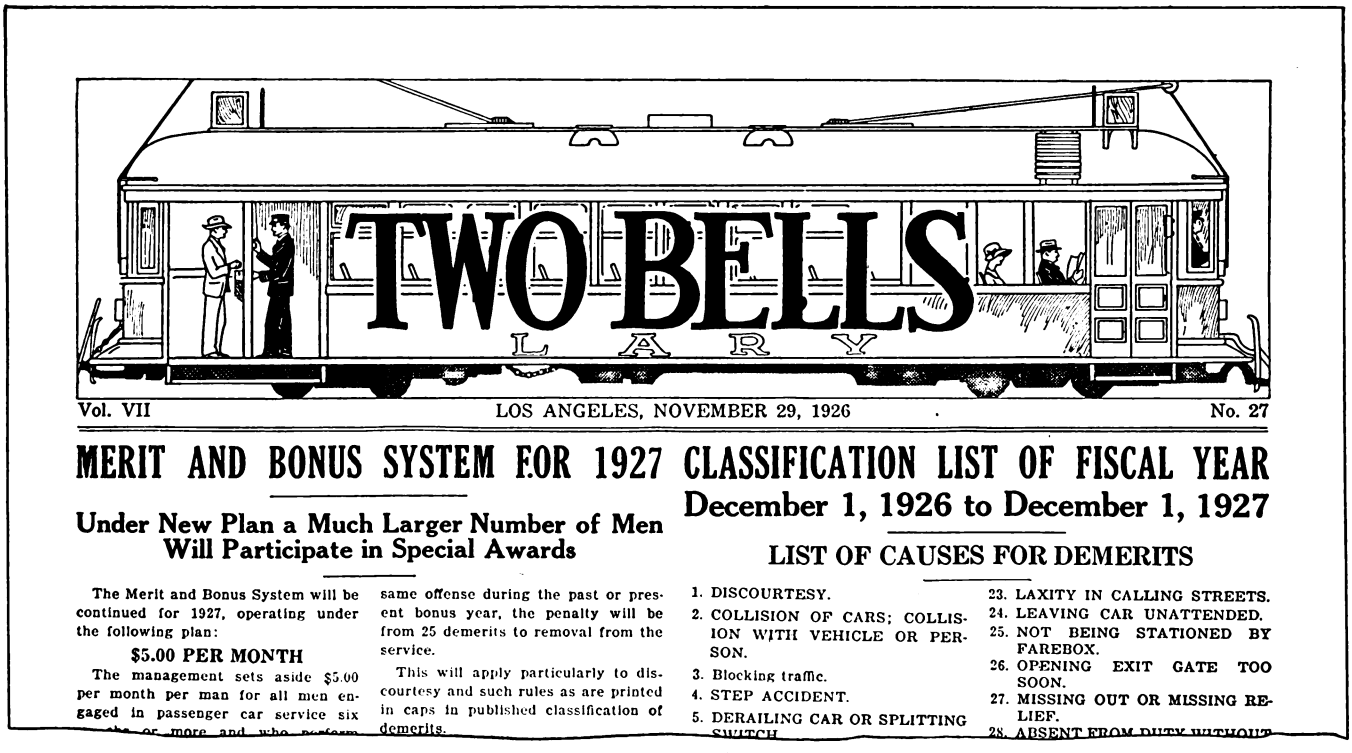
Popularity of this rebuilt interurban car operated by the Union Street Railway on the New Bedford-Fall River route is indicated by the number of inquiries concerning its time of departure

Operating Efficiency Raised Through the Merit System

Systematic administration of discipline, coupled with awards for good records and further bonuses for especially meritorious service, has proved popular with management and men in Los Angeles

IN A CITY where the ratio of population to automobiles is approximately two to one the problems of a street railway property are many. Add to this the difficulty of keeping on an even keel financially with a 5-cent fare and the solution of operating problems becomes more complicated.

Such is the situation in Los Angeles, where the Los Angeles Railway renders extensive city service under conditions far from what would be termed favorable. Efficient performance of shops, equipment and substations and modern track and roadbed have had their collective effect in assisting in the successful operation of the property. However, a large share of the success, according to the management, is attributable to the transportation department—2,700 platform men who on this particular property act as salesmen of transportation. It is this sales effort that has resulted in increased patronage from a public where every other individual is able to ride in an automobile of his own.


TWO BELLS

LARY

Vol. VII LOS ANGELES, NOVEMBER 29, 1926 No. 27

MERIT AND BONUS SYSTEM FOR 1927

Under New Plan a Much Larger Number of Men Will Participate in Special Awards

The Merit and Bonus System will be continued for 1927, operating under the following plan:

$5.00 PER MONTH

The management sets aside $5.00 per month per man for all men engaged in passenger car service six

same offense during the past or present bonus year, the penalty will be from 25 demerits to removal from the service.

This will apply particularly to discourtesy and such rules as are printed in caps in published classification of demerits.

CLASSIFICATION LIST OF FISCAL YEAR December 1, 1926 to December 1, 1927

LIST OF CAUSES FOR DEMERITS

1. DISCOURTESY.
2. COLLISION OF CARS; COLLISION WITH VEHICLE OR PERSON.
3. Blocking traffic.
4. STEP ACCIDENT.
5. DERAILING CAR OR SPLITTING

23. LAXITY IN CALLING STREETS.
24. LEAVING CAR UNATTENDED.
25. NOT BEING STATIONED BY FAREBOX.
26. OPENING EXIT GATE TOO SOON.
27. MISSING OUT OR MISSING RELIEF.

The successful operation of the Los Angeles Railway is based 90 per cent upon the efficiency of the men who man the cars

Trainmen work under what is known as the merit and bonus system, but which, in effect, is an efficiency plan based upon the principle that a man is rewarded with additional compensation for rendering service which is 100 per cent perfect. A bonus of $5 per month is paid to each man for giving safe and courteous service and a 100 per cent performance. In addition to this $60 a year, those whose records warrant it are entitled to additional awards, the maximum of which for the year 1927 per man will be $40. These additional awards are available to all trainmen who have perfect records, so the bonus for a large number will amount to $100 a year. However, service which is not meritorious is not rewarded, deductions being made from the $5 a month bonus for infraction of rules or established regulations.

In the application of the merit system to this property no attempt has been made to tie it down entirely to the claims department work in the prevention of accidents. Safety is only one of many factors entering into the plan. Courtesy is on a par with safety. It has been the aim of the management in establishing this system to better public relations, thereby gaining good will by improving its own relations with its train-

men. This effort has resulted in a personnel of satisfied salesmen.

To the company this system means an extra annual expenditure of approximately $125,000. The return from this expenditure cannot be measured exactly. However, one factor stands out above all others. It is recognized by those familiar with both the operating and financial status of the company, namely, that the good will of the public obtained through courteous service on the part of the trainmen has resulted in increased riding. This has made possible the operation of the lines on a 5-cent fare. Another tangible result of the system has been the noticeable reduction in accidents and also the reduction in claims. The first is attributable to safe operation, the second to the establishment of better public relations.

From the time a man enters the service of the transportation department a record is kept of his efficiency. This record card is made out annually by the merit department. It determines whether a man is entitled to the full bonus for each month or a portion of it.

Efficiency record cards are kept in the department office and filled out monthly, or at such time as the man receives a demerit or credit for his efficient or inefficient service. If entitled to it, the trainman also receives credit at the end of each month for safe and courteous operation. The award of credits or the allocation of demerits, with the exception of fixed cases where the case itself determines, and the number to be awarded or subtracted are in the hands of the supervisor of merits. This arrangement has proved more satisfactory than the previous arrangement whereby the division superintendent made the award or gave a demerit.

CAUSES FOR DEMERITS

A list of demerits has been set up by the department and contains 40 classifications, under any one of which a trainman may receive demerits. Each man is judged separately as to whether he is entitled to credit or demerit. Inefficient operation on the part of the motorman does not necessarily affect the record of the conductor. The same holds true in regard to the motorman's record. The accompanying list of causes for demerit has been set up under the 1927 plan.

It will be noted that some classifications of demerit have more prominence in the table than others. Under the rules for the ensuing year, where it is found necessary to assess demerits against a man who has been previously demerited for the same offense during the past or present bonus year, the penalty will be from 25 demerits to removal from service. This will apply particularly to disregard of such rules as are printed in heavy type in the classification. Demerits are assessed on recommendation of division superintendents, supervisors, instructors, safety men and others in authority. All reports on which demerits are based are checked in the main office by the supervisor of the merit system before being entered on the record and forwarded to the division superintendent.

Deductions from the bonus are made at the rate of 25 cents for each five demerits assessed (five demerits equal 1 per cent), regardless of previous efficiency as shown on the record. When a man's efficiency rating drops below 75 per cent he is subject to automatic dismissal from the service. However, dismissal from service for other offenses may be made regardless of the efficiency rating.

Ten credits are allowed each month for a clear courtesy record and ten credits for a clear accident record. As was previously stated, these credits are given automatically.

Demerits are canceled from a man's record only in case of an error in report or extenuating circumstances, which must be explained to the satisfaction of the supervisor of the merit system. Appeals from demerits assessed must be made within 30 days, first to the division superintendent and second to the supervisor of the merit system.

To establish a man's efficiency rating, which is upon a percentage basis, each five credits or demerits counts for 1 per cent. Thus, if a man's record is perfect for the month for both courtesy and safety and he has received neither demerits nor credits his efficiency rating would be raised 4 per cent. At the end of a year his efficiency record should be 148 per cent. With the possibility of a 148 per cent rating for courtesy and safe operation, the figure 75 per cent, which is about one-half of this amount, should warrant dismissal from the service.

Each year since the inauguration of the merit and bonus system, in 1920, there has been a gradual tightening up on the men, a stricter enforcing of discipline and the subsequent changing of the number of demerits

Classification List for Fiscal Year Dec. 1, 1926, to Dec. 1, 1927

LIST OF CAUSES FOR DEMERITS

1. **Discourtesy.**
2. **Collision of cars; collision with vehicle or person.**
3. Blocking traffic.
4. **Step accident.**
5. **Derailing car or splitting switch.**
6. Bending or breaking trolley pole, or operating against same.
7. Carrying passengers past destination.
8. Passing up passengers.
9. **Failing to report accident.**
10. **Doubling electric switch.**
11. **Excessive speed.**
12. **Running ahead of time.**
13. **Dangerous operation.**
14. Errors on cards and trip sheets.
15. **Remaining seated while passengers boarded or alighted.**
16. Failing to have watch inspected.
17. **Giving bells too soon, or with back to steps.**
18. Going against traffic signal.
19. **Failing to make safety stop.**
20. **Leaving terminal late.**

*21. Improper operation or flagging at railroad crossing. (Special rule).

22. Improperly equipping car. (Dash sign, T. R. No., or lights).
23. **Laxity in calling streets.**
24. **Leaving car unattended.**
25. **Not being stationed by farebox.**
26. **Opening exit gate too soon.**
27. **Missing out or missing relief.**
28. **Absent from duty without permission.**
29. Reading newspaper.
30. **Starting car too soon, or without bells.**
31. **Violating road space.**
32. Smoking while on car.
33. **Remaining seated on stool in zone 1.**
34. **Failing to sound gong at dangerous street or when starting up.**
35. **Visiting with motorman or riding front section.**
36. **Improper feeding of controller, or abusing equipment.**
37. **Wasting power.**
38. Failing to report accident or delay promptly or to dispatcher.
39. Unnecessary conversation.
40. Miscellaneous.

CREDITS

No classifications.

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*Note: Penalty for same: Sent to instruction department one day without pay.

given for certain offenses. Now a high percentage rating does not prevent a man from losing part of his bonus for being demerited during the month. Thus the illustration of the efficiency record card of R. P. Andrews shows that he received only $4 of his bonus for the month of December, the first month in the fiscal year of the bonus plan. He received twenty demerits during the month, which amounted to $1. In addition to the standing credit for courtesy and safety, there is also a standard demerit for loss of time. This amounts to 16⅔ cents for each day out of service over the five per month allowed each man. This deduction in bonus is not recorded as so many demerits on the efficiency record. It does not affect the percentage standing.

Los Angeles Railway

1. The following three examples give the leaving time at the terminals and the number of minutes running time between intermediate time points. In each case, what time would you arrive at the other end of the line?

Leaving at 9:53 a.m. Min.	Leaving at 10:59 a.m. Min.	Leaving 11:43½ p.m. Min.
7	9½	7½
8½	8	4½
9½	5½	9½
11½	7½	7
7½	13½	8½
9	8	15½
...	9½	7½
Arrive at...........	Arrive at...........	Arrive at...........

2. If you started to work at 7:59 a.m., and were relieved at 1:53 p.m., and resumed duty again at 2:39 p.m., and completed your run at 6:29 p.m., how much time would you put down on your trip sheet for the entire day's work?

Answer..............hours..........minutes.

3. If you started to work at 6:27 a.m., and were relieved at 9:19 a.m., and resumed duty again at 10:47 a.m., and were relieved at 12:07 p.m., and started the last portion of your run at 3:57 p.m., and completed same at 7:11 p.m., how much time would you put down on your trip sheet for the entire day's work?

Answer............hours............minutes.

4. Add the following two problems:

9839	796
784	3957
977	486
7459	9758
585	945

5. Subtract the following four problems:

79381	93775	71005	50738
68493	92887	70996	49849

6. Multiply the following five problems:

9397	8995	4807	69387	7698
5	7	9	5	9

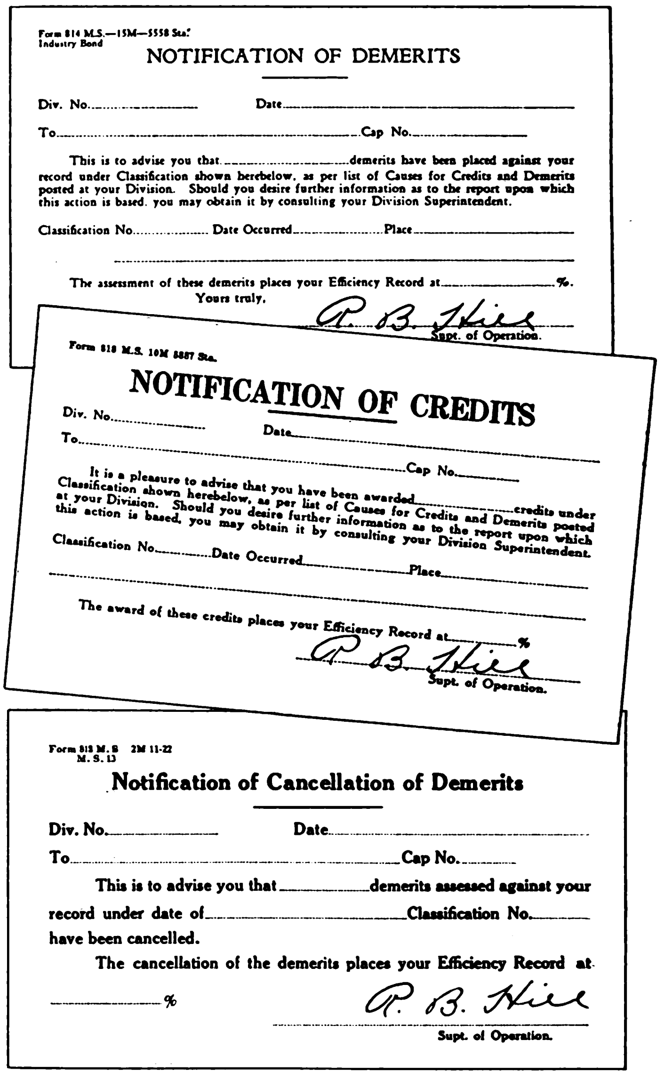
7. Divide the following four problems:

5)19790 5)9330 5)87505 5)3795

Date............19.... Signed.................................
Applicant.

Typical examination form used

In addition to the regular bonus, special awards have been given each year for particularly good service. During the year 1927 two classes of awards will be made. The first class gives an additional award of $40 to all men in active passenger service who have not lost more than 60 days time during the year, who have clear courtesy accident records and who have received no demerits. The second award gives an additional award of $20 to all men who have not lost more than 60 days time, who have clear courtesy and accident records, who have not been demerited more than three times and with no repetition under any one classification, and who have received no demerits for infraction of rules under the classifications printed in large type in the accompanying list. With these awards and the regular bonus, the company expects to spend during the next fiscal year of the bonus approximately $125,000 on the system. The bonus is credited monthly to the record and paid on the Dec. 15 for the previous fiscal year ending Dec. 1. If a man loses his job or leaves the company he automatically loses his bonus. Also a man does not participate in the bonus until he has been in the service of the company six months, a three months probation period being counted in this six months.



Form 814 M.S.—15M—5558 Sta.
Industry Bond

NOTIFICATION OF DEMERITS

Div. No.................... Date....................
To...Cap No....................

This is to advise you that....................demerits have been placed against your record under Classification shown herebelow, as per list of Causes for Credits and Demerits posted at your Division. Should you desire further information as to the report upon which this action is based, you may obtain it by consulting your Division Superintendent.

Classification No.............. Date Occurred.................. Place....................

The assessment of these demerits places your Efficiency Record at....................%.
Yours truly,
R. B. Hill
Supt. of Operation.

Form 818 M.S. 10M 8887 Sta.

NOTIFICATION OF CREDITS

Div. No.................... Date....................
To...Cap No....................

It is a pleasure to advise that you have been awarded....................credits under Classification shown herebelow, as per list of Causes for Credits and Demerits posted at your Division. Should you desire further information as to the report upon which this action is based, you may obtain it by consulting your Division Superintendent.

Classification No.............Date Occurred....................Place....................

The award of these credits places your Efficiency Record at..............%
R. B. Hill
Supt. of Operation.

Form 813 M.S 2M 11-22
M.S. 13

Notification of Cancellation of Demerits

Div. No.................... Date....................
To...Cap No..........

This is to advise you that..............demerits assessed against your record under date of....................Classification No.......... have been cancelled.

The cancellation of the demerits places your Efficiency Record at
..............%
R. B. Hill
Supt. of Operation.

Notification is sent to each trainman on these forms as to demerits or credits or the cancellation of demerits

In 1921, out of 2,150 trainmen, 1,977 received the full bonus or a portion of it and 77 of these received extra awards. These extra awards consisted of a double bonus for the motorman and conductor of each of the five divisions whose standings were the highest, with additional special prizes of $25 for each of the second men, fifteen for the third and four additional prizes of ten dollars each as separate prizes for one-man car operators.

In 1922, out of the 2,350 trainmen, 1,930 received a full or portion of the bonus and 110 of the high men at the various divisions received special prizes aggregating about $4,000. The highest conductor and motorman in each division received $60, the next $25, the third $15 and four other prizes of $10 each.

In 1923 approximately $100,000 in bonus money was distributed to approximately 2,500 trainmen out of the 2,700 trainmen in the service. Special prizes were awarded to 110 of the top men. In 1924 2,330 trainmen participated in the bonus and received $106,000. New high records were established as regards the number of men participating and in the amounts paid. In 1925 2,208 trainmen participated in the bonus and received $110,000.

In 1926 the plan of awards was slightly changed to avoid a condition which experience showed to exist. Under the original merit system the $5 monthly bonus was paid to each trainman unless he was demerited or penalized for lost time, so that if his efficiency rating was 100 per cent or over and if he was not penalized for lost time he would receive the full bonus of $5 a month. Under this plan a man whose rating was 120 per cent might receive 50 demerits, which would lower his efficiency rating to 110 per cent, without affecting his bonus, as the bonus was affected only when his efficiency rating dropped below 100 per cent. In the plan now in force, when a man receives demerits, regardless of his efficiency rating, he loses 25 cents for each per cent deducted at the time demerits are assessed.

In 1926, in addition to the regular $60 a year bonus, special awards ranging from $10 to $100 were made to the ten top motormen, to the ten top conductors of each of the five divisions and to the ten top safety car operators. These prizes are divided as follows: There is one of $100, one of $75, one of $60, one of $40, one of $25, one of $15 and four of $10 each. These special awards went to 110 men. The absence of demerits and the amount of time worked were factors considered in picking these men. Mere accumulation of credits did not come in for any great amount of consideration as each man automatically received ten credits each month for a clear safety record, as well as ten credits for a clear courtesy record. This same method of picking men for special award is in effect for the fiscal year of 1927, but under an arrangement by which the highest man will receive only $40 instead of $100. However, there is a greater spread of special award money for the ensuing year and more awards will be made.

HOW DEMERITS OR CREDITS ARE GIVEN

In checking trainmen, supervisors and inspectors exhaust every possible effort to correct deficiency before recommending demerits. If they find they cannot handle the case without recommending demerits they report the fact to the supervisor of the merit system, who determines the number of demerits to be assessed for such violation and has the necessary entry made on the man's record. In most cases a man receives ten demerits for the first offense, ten for the second, fifteen for the third, twenty for the fourth, etc. When a man's rating drops to 90 per cent a personal letter is sent to him or he is asked to call at the office so that the supervisor of the merit system may go over his record with him. He is given to understand that he must discontinue violating the company rules if he expects to remain in the service.

Reports of trainmen's operating efficiency are made directly to the supervisor of the merit system. They come in on various forms, depending upon their origin. However, the responsibility for making the award of merits or demerits rests on the supervisor of the merit system. When his decision is reached, a notification slip is sent to the trainman, a blue slip advising him of demerits and a pink slip of credits. At this time the entry is made on the man's efficiency record card and his percentage worked out to include the particular demerit or credit.

On the efficiency record the credits are entered in black figures, the demerits in red and the percentage column in black, 100 per cent or over, and below this in red. This enables the supervisor to glance at a man's record card and tell at once whether he has been repeatedly demerited.

The merit system has succeeded far beyond the early anticipations of the company and after six years neither the higher officials nor the supervisors could be prevailed upon to abandon it, nor would the trainmen themselves give their consent if they had their choice. During the fiscal year 1924-25 the company adopted the policy of automatic cancellation. Under this plan, after the man had been demerited for violation of some rule, if he did not repeat the violation for a period of 90 days the demerits would automatically cancel themselves. After working this plan for a short time, it was found unsatisfactory. The merit system was originated and placed in operation by George Baker Anderson, manager of transportation, and is now under the direct supervision of R. A. Pierson, who reports to R. B. Hill, superintendent of operation.

Questionnaire

Motormen

Motormen will fill in answers to the questions given below on the reverse of this sheet, using additional paper if necessary, and numbering same to correspond to the question, and will turn the completed sheet in, signed with name, cap number and division, to the division foreman not later than April 24.

Motormen failing to give correct answers will be called in for additional instruction.

No. 1. What is required of a motorman when using group movement from the third position?

No. 2. What is required of a motorman when railroad crossings are being flagged?

No. 3. What is the rule in regard to backing up, and how can you signal your conductor when wishing to back up a short distance?

No. 4. What does a plain yellow sign, or one with a black cross on same, indicate when suspended from span wire?

No. 5. When power is off, are cars to be allowed to coast down grade, and if not, why? And what cars start first after the power has been off?

No. 6. Under what conditions may passengers be passed up, and what precautions must be taken when doing so?

No. 7. Are cars allowed to group over electric switches, or double in opposite directions over same?

No. 8. What is the road space rule when operating in Zone No. 2, and why should a motorman so operate his car as to avoid having to make the 100-ft. stop?

No. 9. Mention five things which a motorman must not do while the car is in motion.

No. 10. At what speed should a car be operated, and what precaution should be taken when unloading newspapers?

No. 11. Is it permissible to pull a car in over the pits while passengers are still on board?

No. 12. Who is responsible for knowing that all necessary dash signs are on the car before pulling out?

R. B. HILL,
Superintendent of Operation.

Carpenter Shop Waste Disposal Plant

Shavings and Sawdust Are Conducted Directly to an Incinerator, Where They Are Disposed of Speedily and with No Excess Labor

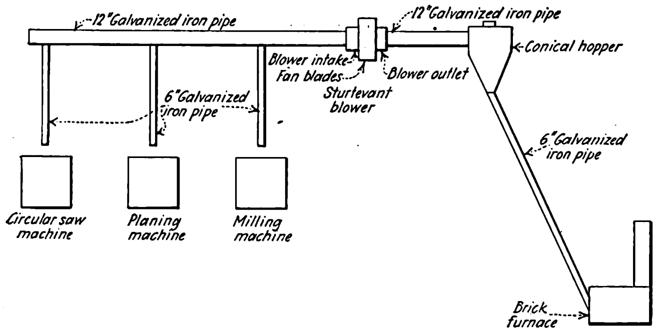
EQUIPMENT for the automatic removal of sawdust and shavings from the various wood-working machines to an incinerator is a feature of the carpenter shop of the Virginia Electric & Power Company, Richmond, Va.

A 36-in. Sturtevant blower erected on a solid foundation about 15 ft. above the carpenter shop floor is driven by a belt from a near-by line shaft. A 12-in. galvanized pipe connected to the intake of this blower extends longitudinally through the shop. A 6-in. galvanized pipe leads to the 12-in. pipe directly from each sawdust or shaving forming machine from which the refuse is to be collected. One end of the 12-in. galvanized pipe is connected to the outlet side of the blower and the other end is fastened to the top of a conical hopper erected in the yard directly back of the shop.

A 6-in. galvanized pipe connected to the bottom of this hopper extends downward at an angle of about 45 deg. and enters the firebox of a brick furnace erected about 15 ft. distant.

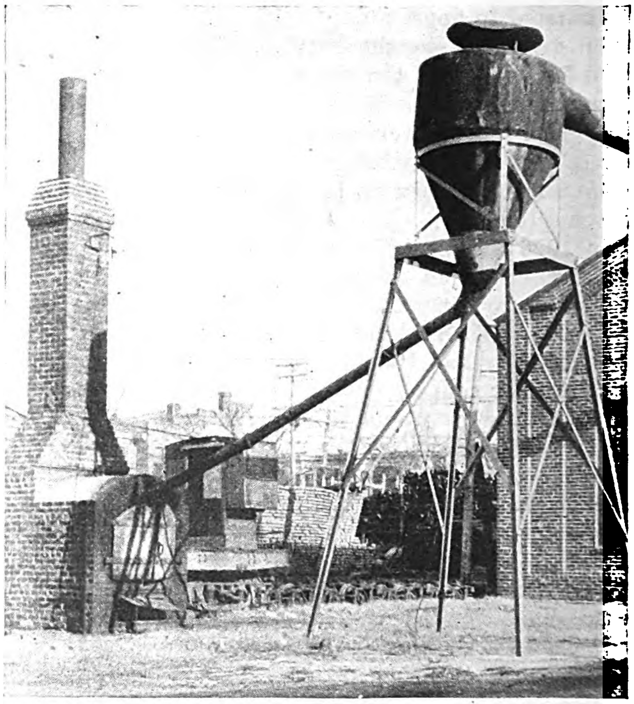
Immediately after its formation waste material is drawn up through the 6-in. pipe by the fan intake into the 12-in. pipe connected to the intake side of the blower. From here it continues on, passes through the blower fan blades, is blown through the 12-in. pipe connected with the outlet side of the fan and is deposited into the hopper in the yard. The waste swirls around inside of the hopper, drops to its bottom and passes out through the 6-in. pipe, finally falling into the firebox, where it is burned.

The pipes and hopper are made of No. 16 galvanized iron. Careful riveting and soldering of all joints provides an airtight line. The blower air is exhausted through a fine-mesh screened opening in the top of the hopper, which has an over-all depth of 9 ft. and a maximum diameter of 6 ft. The depth of the cylindrical portion above the supporting frame belt is 3 ft.



General arrangement of equipment for disposal of wood waste in Richmond, Va.

The furnace is built of ordinary red brick. Its outside base is 6 ft. x 6 ft. and the firebox is 5 ft. x 4 ft. x 4 ft. Above the firebox the base tapers down to 30 in. x 30 in. for the formation of the chimney. A damper in the chimney permits of draft regulation. The firebox is provided with an iron grate. Both the firebox and ash compartment are inclosed by heavy iron doors.



Tower, conical hopper, brick furnace and waste pipes used for wood refuse disposal in the Richmond, Va., shop of the Virginia Electric & Power Company

The tower uprights for the support of the conical hopper consist of 50-lb. T-rail imbedded in a concrete foundation. These four T-rails are bound together at the top by a 6-in. angle frame. The reinforcement is made of 2-in. angles. The supporting cradle for the conical reservoir is made of $\frac{1}{2}$-in. x 3-in. bar iron. All of the framing is carefully designed and riveted securely together.

This incinerator not only disposes of the carpenter shop refuse material, but of practically all inflammable waste collected throughout the shop and grounds. It has provided a means for maintaining a neat and clean carpenter shop appearance and has eliminated the necessity of constantly removing the rapidly accumulating waste by hand, thereby effecting a substantial saving in labor. The danger of fire has been reduced by the immediate disposal and burning up of the waste material.

Alarm Clocks for Bus Patrons

BUS patrons of the San Antonio Public Service Company, San Antonio, Tex., are pleased with an ingenious device installed at one of the company's loading stations for showing the time their next bus will arrive. An alarm clock with illuminated dial has been placed in the center of a square piece of cardboard on which are printed the names of the different lines, showing the time the next bus will arrive. For example, if a bus leaves the station every twenty minutes starting on the hour, then the name of that bus line is printed above the figure "12" on the clock, next to the figure "4" and the figure "8." Similar names printed around the face of the clock show the time each bus leaves, and a glance at the clock shows the patron how long it will be before another bus on that line is due. This practice has proved very popular with the patrons. Women who have one or two purchases to make are able to see by the clock that they still have a few minutes and are thus assured of making their purchases without missing their bus. The arrangement is simple and inexpensive, yet it is a point of service which cannot be readily overlooked.

The Readers' Forum

The Glory that Is Rome's

NEW YORK, June 2, 1927.

To the Editor:

Methods of transportation used in the Eternal City were brought home forcefully to me by the article in the JOURNAL for May 28. Many of the practices reviewed therein contain nothing new to the sophisticated European traveler, but not many men in America are foreign travelers or sophisticated when it comes to things European. For that very reason the account should be of the greatest interest to American readers. Not only that, but throughout the story there was just the touch of local atmosphere imbibed by the observer on the spot that was needed to convey the reasons for some of the differences between American and European practices.

Of course the main transportation problem, that of getting vehicles through the central district quickly, is the same here as it is abroad, but the difference in habits of the continental injects the elements that make for dissimilarity of detail. Consider the matter of peak loads! The taking of two hours for lunch is not unusual among American business men, but it does not extend to the rank and file here. Moreover, the noonday recess in American cities is not attendant with the formality that attaches to the process in Europe. Appreciation of the pomp and circumstance which attend this European noonday shutdown are essential to the American if he is to understand fully the differences in the peaks of riding which this leisurely practice introduces as a problem to the European operating executive. But this is only one of many things. The reference to the rarity of the traffic policeman in Rome is also another touch of local color, just as is the observation that motor traffic in Rome shuns the streets on which there are car tracks. It is interesting to reiterate that the present independent bus service is routed over streets that do not contemplate the ascension of any of the seven hills on which the city is built. That work is left for the trolley.

It is nothing new, of course, to know that the selling of the tramway service has long been a factor in the scheme of things of the tramway management at Rome, but the extent to which the process has been carried must have come as a revelation to many American readers. Particularly wise have the Latins been in so arranging the "tramway guide" that it is sold, rather than given away, for it is a notorious fact that human nature takes lightly the things that are free. Technically, of course, the American trainman may have the right to refuse admittance to the passenger who does not proffer the exact fare, but it must seem a little strange to the American operator to observe that it has been made plain to the riders of Rome that the trainman "has the right to refuse admittance to the car to all persons who do not present the exact fee."

The account of railway operation in Rome as set down in the JOURNAL was most interesting. It all goes to show, as the writer in the JOURNAL intimated, that transportation men the world over are kin and that dependable transportation is essential much of the time to the colonel and his lady and all of the time to Mr. and Mrs. O'Grady.

J. G. RAYMUR.

Performance Figures on Great Northern Oil-Electric Locomotive

PERSONS interested in the performance of oil-electric units will welcome the following figures compiled by the Great Northern Railway on its oil-electric locomotive No. 5100, now in switching service at Minneapolis. The compilations, furnished through the courtesy of W. R. Mills, general advertising agent at St. Paul, Minn., cover April, 1927. The engine was in service 575 hours at 6 m.p.h. and traveled 3,450 miles.

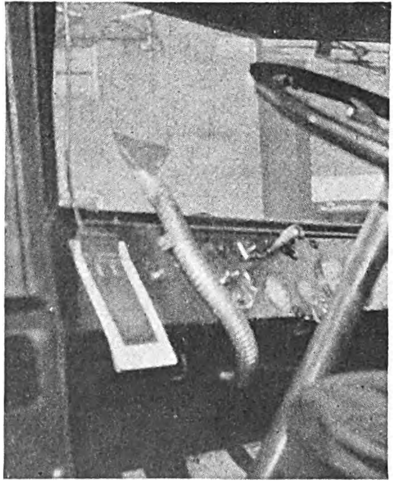
REPAIRS		
Labor		$177.64
Material		71.95
Total cost of repairs		$249.59
Cost of fuel oil—5,740 gal. at 3 cents per gallon		172.20
Cost of lubricating oil		53.79
Cost of miscellaneous supplies		3.26
Engine house expense, thirteen handlings at $4.184		54.40
Enginemen's wages:		
Engineers	$541.95	
Firemen	409.65	
Total		951.60
Total		$1,484.84

COSTS IN CENTS PER MILE TO RUN OIL-ELECTRIC ENGINE:	
Repairs	7.23
Fuel	5.00
Engine house expenses	1.58
Lubridants	1.56
Other supplies	.09
Wages	27.58
Total	43.04

The following comparison may also be interesting:

	Oil-Electric Engine	Eight-Wheel Switch Engine
Tractive power	60,000	58,500
Weight on drivers	209,500	232,600
Total weight engine and tender	209,500	375,500
Weight on drivers to T. P.	3.47	3.98
Superheated		Yes

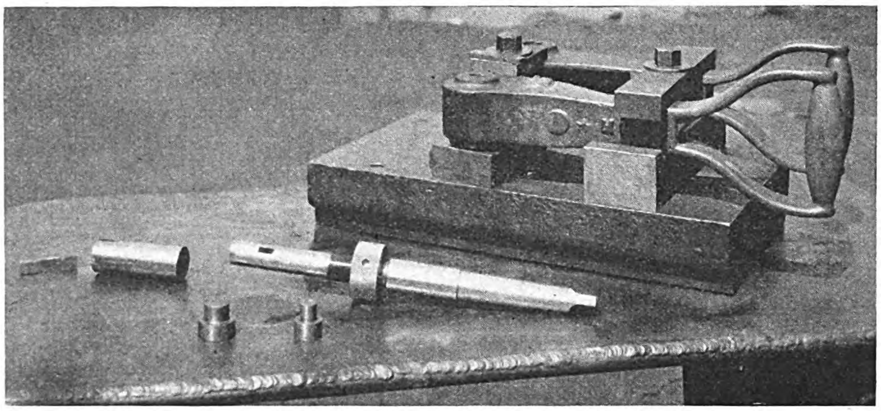
Windshields Kept Free of Frost



Hot air dries windshield

WINDSHIELDS of the interurban buses operated by the Indiana-Columbus Eastern Traction Company are kept free of frost by a small stream of hot air from the engine. The illustration shows a flexible metallic tube carried out over the exhaust manifold, through which the heated air is conducted to a flat-edged nozzle, so that it blows on the inside of the windshield, keeping it just warm enough to prevent the formation of frost or mist in any weather. This simple device, made in the shops of the company, has been used on practically all of the buses throughout the past winter. These buses operate between Dayton, Springfield and Columbus, a distance of 52 miles, at 30 to 35 m.p.h.

screws. The bottom end has two rectangular openings for inserting cutting tools. The second part of the tool consists of a sleeve which fits over the bottom portion of the shank. This has notches at one end so that when the cutting bit, which is the third part of the device, is inserted through one of the rectangular holes in the shank, the sleeve can be forced down against the bit by turning the knurled collar, and the notched portion fits over the cutting tool to hold it securely.



Fixture for finishing brake handles and plug gages for testing

For the finishing work, two handles are placed in a special jig. When the handles are rights and lefts one of each kind is used. When the handles are of the same type one is turned with the reverse side up. The holes cored through the center in the rough casting are first bored out to the required size. They are of two diameters, the top 1⅛ in. and the bottom 13/16 in. After the holes are bored out the facing tool is inserted and the top portion is finished. The cutting bit is then removed by loosening the knurled collar and the shank is lowered so as to project through the top surface. The tool is then inserted inside the casting and the underside of the top boss, together with the top side of the lower boss, is finished. The final operation consists of finishing off the face at the bottom. For this the handle is reversed.

In the accompanying illustration the cutting bit is shown at the extreme left, the sleeve which fits over the shank in the center and the shank itself with the knurled clamping collar to the right. The jig with

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$200
for 100 Words

First	$200
Second	$100
Third	$ 50
Monthly Prize	$ 25

AWARD of the first monthly prize in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition, announced in last week's issue, has stimulated efforts to be the winner of one of the capital prizes as well as a monthly prize. Who will be the winner of the next monthly prize? One thing that has received comment is that but a very short description of an idea can win the prize. This is one time that the number of words does not count. It is the value of the idea that receives first consideration.

The real stimulus in all sports is that there is a chance to win. We play harder, work harder and think harder when there is sure to be some recognition that the best effort will be acknowledged. The prizes in ELECTRIC RAILWAY JOURNAL'S Maintenance Competition are offered as a stimulus to maintenance men in any electric railway department to develop and adopt improved methods for performing a routine job. The prizes will be awarded primarily on the value of the idea presented and its adaptability to maintenance work. Still greater value than that afforded by the cash prizes may result from the recognition that the winners can be considered as leaders in improved maintenance.

GENERAL PROVISIONS

ANY employee of an operating electric railway or electric railway bus subsidiary may compete for the prizes to be given by ELECTRIC RAILWAY JOURNAL for short maintenance items. Full information is given in the April 16, 1927, issue, pages 700-701.

The author does not necessarily have to be the originator of the idea or device. An article may be submitted by several persons or by a department and need not be written by the person in whose name it is submitted.

Articles may treat of any maintenance practice or device used by any department of an electric railway and should be preferably 100 to 200 words in length and accompanied by one illustration. Brevity consistent with a proper presentation of information will be given weight in judging articles. In no event should they be longer than 400 words with more than two illustrations.

Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes, the envelope must bear a postmark dated before Aug. 1, 1927.

In addition, a prize of $25 will be awarded each month. Groups of articles submitted were published in the Maintenance Data Section of ELECTRIC RAILWAY JOURNAL for May 21 and June 18, 1927.

If sketches accompany the manuscripts they may be in pencil, or blueprints will be accepted. Each item submitted should bear the name or names of the individual or individuals by whom it is submitted and to whom awards are to be made. The manuscript should also be marked "Maintenance Competition."

The announcement of the winner of each monthly contest will be made in the issue devoted to maintenance and construction, the third issue of the month, following the one containing the item.

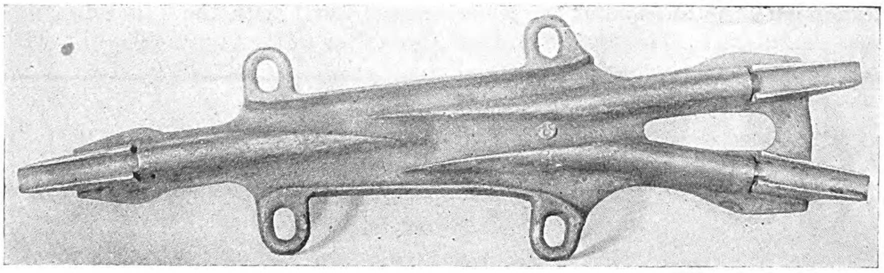
The winners of the capital prizes will be announced in the Annual Convention Number of ELECTRIC RAILWAY JOURNAL, to be published in September, 1927.

two handles in position, is shown in the background. The two small parts in the foreground are plug gages for checking the size of holes bored in the handle.

New Equipment Available

Overlapping Runner Trolley Frog

CUTTING of the pan by the trolley wheel is said to be eliminated by the type CF overlapping runner trolley frog developed by the Westinghouse Electric & Manufacturing Company. The open space in the pan has been removed by overlapping the runners so that at all times the wheel rides on the runners and the flanges do not touch the pan. This results in from three to four times the length of life of the open pan frog. This type of frog insures more positive tracking of the wheel. It is equipped with bayonet type approaches, which are easy to install and which give a smooth transition of the wheel from the wire to the runner of the frog. The frog is made in 15-deg. right-hand and left-hand V shape and 20-deg. right hand and left hand. It is made for all sizes and shapes of wire.



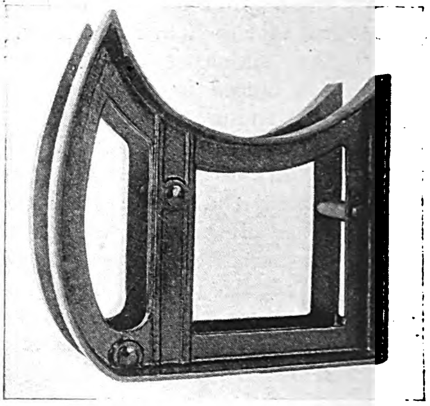
With this frog the trolley wheel flanges do not touch the pan

Cradle Assists in Framing Poles

DURING the past years of pole line construction crews have followed the practice of lifting the pole up bodily while a support was placed under it. To reduce the number of accidents which occur from this method and also to provide an easier means of framing poles the E-Z-Up pole cradle has been developed and is now being marketed by Farnham & Cunningham, Los Angeles, Cal.

This new pole cradle uses the cam principle to lift a pole into position for framing. It is made of malleable steel and a cant hook or peavey is the only additional tool equipment necessary besides the cradle. In using, the E-Z-Up pole cradle is placed against the pole and the point of the cant hook or peavey is dropped between the two rockers so that the end presses against the cross bar nearest the nose of the cradle. The hook then catches in the opposite side of the pole and by pulling the handle and pressing with the foot against the heel of the cradle the pole is rocked into position. In case the pole does not lie with the proper face up it can be rotated easily in the saddle of the cradle by the use of the cant hook.

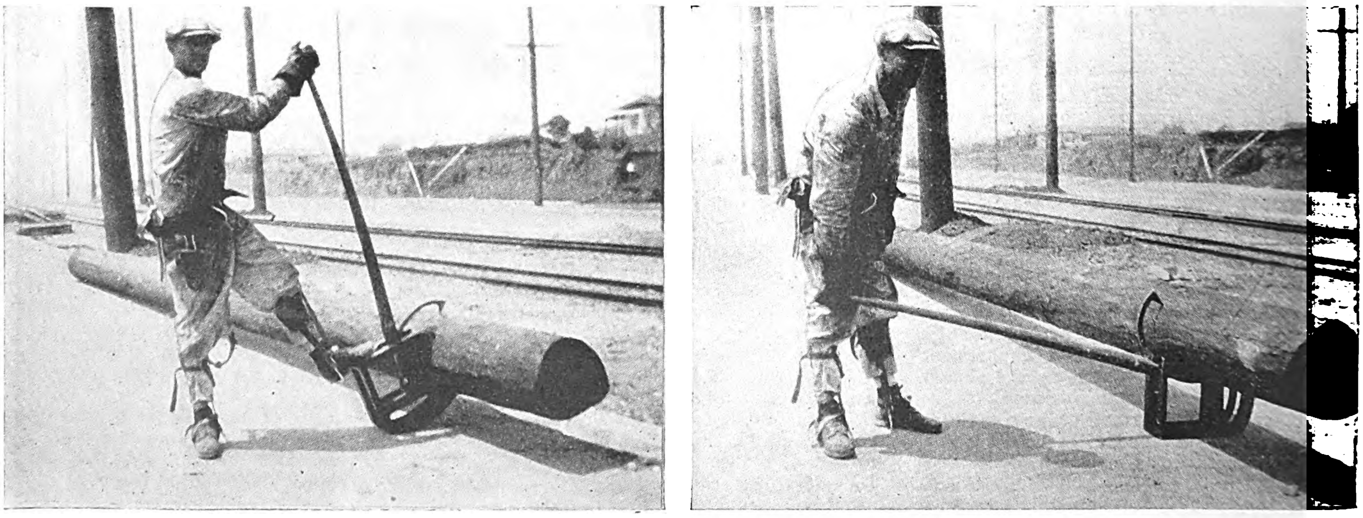
Cradle and cant hook in position to lift pole



The E-Z-Up pole cradle

If it is desired to raise the end of the pole to a higher position, the cradle should be placed further down on the pole. It can be placed at the approximate center of gravity of the pole and one man can turn the pole easily end for end by adding his weight to the high end of the pole. Where work is to be done on soft or sandy soil a board or thin steel plate should be placed under the cradle to keep it from sinking into the ground.

A lineman of average weight has no difficulty in lifting a 65-ft. cedar pole with this device.



At left, with the workman's foot pressed against the cradle, the handle of the cant hook is drawn toward him. At right, final position of the pole as it rests on the cradle

Field of the Motor Bus*

By A. J. Brosseau

President Mack Trucks, Inc.

If we glance at the statistics of bus use we will find that of the 80,000 vehicles now in service, 32,778 are employed in transporting children back and forth from school. This business is nearly all in the hands of the so-called independent operators. For future bus use here is one of the largest fields.

As to the rail carriers, there are indications on every side that they should extend the use of the bus in urban operations. Two of the most promising fields are:

The marginal area in every city, in which rail car services are performed at a loss.

The de luxe express service from these districts to downtown areas, or both of these services.

In these fields the wideawake and forward-looking rail carrier can employ the bus to his advantage and render his customers better service, at lower cost, than he can by using the trolley.

The place of rail lines in handling mass transportation in congested centers appears, at the moment, to be secure from an economic point of view. At what point of thinning density, however, the bus begins to give a superior all-round service upon an economical and profitable basis is a question upon which there is not yet conclusive evidence. We know that the vehicle has been substituted for entire trolley systems in 65 towns and cities, all of them under 100,000 population. Whether the bus, in its present state of development, can replace the trolley in cities of larger size must be decided by the experience of the rail operators with buses.

This experience, to be worth while, must be based on facts—all the facts. "Experience" to prove that buses are not as efficient or desirable as the trolleys can easily be upheld by any one who is determined to prove the superiority of the trolley by overlooking some of the facts. On the other hand, the case of the bus must be proved by facts—all the facts. The time has come when both trolley and bus must stand or fall on their respective merits.

Eventually, all street railway companies come to the point where new equipment has to be purchased, new rails or pavement or both installed, and power houses renovated. When this happens they must decide whether it is advisable to substitute buses for rail operations.

When the bus first made its appearance in the rural field there was a common impression among rail operators that it was destined to make serious inroads upon their passenger business. Events of the past year and particularly the investigation of the Interstate Commerce Commission have done much to clarify this situation and bring out the facts. We have only to read the testimony of such high railroad officials as P. S. Eustice of the Burlington, F. A. Wadleigh of the Denver & Rio Grande, F. A. Coley of the New York, New Haven & Hartford, and Lewis Saunders of the Gainesville & Northwestern, to appreciate that it was the private automobile—not the bus—which was responsible for nearly all railroad passenger business losses.

The experience of the 61 railroads now operating motor buses would tell a story of savings effected by the substitution of the bus for the unprofitable branch-line rail operation, and that the rail lines are beginning to realize the benefits of improved public relations, growing out of a more frequent and more comfortable service to the public.

I believe that as railroad men give more and more time to the study of savings in costs to be effected by motor transportation, they will turn increasingly to the use of the bus for local operations. In many instances this would mean competition with, or acquisition of, or contract relations with existing independent bus lines. But whatever the method, there will be an expansion of bus services by rail operators, who will then, without extra cost to them, be enabled to give the public more frequent and satisfactory service.

Regardless of the extent to which steam or trolley rail lines go into the bus business, there will remain for the independent bus operator a large field in which he can develop a much needed service to the public. It must be remembered that the greater percentage of the bus movement is not competitive. Assistant Secretary of Commerce J. Walter Drake has pointed out that the bus has placed in touch with the railroads some 45,000 communities not located on rail lines. I believe these independent bus operations will be in the hands of responsible owners operating large or small fleets as local conditions justify.

Liberal Regulation Needed

The troublesome question of regulation is as yet unsolved. I am not an authority on the subject, but permit me to point out some elements which I consider fundamental.

One of the chief virtues of the bus is its mobility. It does not run on rails, but it can go wherever there is an improved road.

It is not costly to stop, hence it can pick up passengers at any point.

Rates per mile should not be uniform unless road and other conditions are comparable.

Regulation should not be based on rail or bus practice of today.

Elaborate systems, such as apply to rail lines, are not needed.

Disregard all or part of these factors and you will retard bus development and so hamper it as to deny the public the benefit of its use.

I emphasize these points because in the initial stages of bus regulation precisely these things were attempted. Legislators, in many cases, did not take into consideration that the bus performs an entirely different service from that of the rail line and that it should be regulated as a bus—not as a rail vehicle.

Bus regulation, of the railroad type, is not only restricted, but it is contrary to the public interest. There are those who believe this sort of punitive regulation was, in the past, prompted by hostile rail interests. Regardless of where the responsibility lies, I am sure rail lines, now operating buses, will not approve of it.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 27, 28—**Public Utilities Advertising Association, Hotel Albany, Denver, Col.**

June 29-July 1—**Central Electric Railway Association, summer meeting, Book-Cadillac Hotel, Detroit, Mich.**

June 30-July 1—**Tramways and Light Railways Association, annual meeting, Bath, England.**

July 11-14—**American Society Civil Engineers, convention, Denver, Col.**

July 22, 23—**Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

July 27-29—**Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.**

Sept. 8—**Central Electric Railway Master Mechanics Association, South Bend, Ind.**

Sept. 13-15—**International City Managers Association, Dubuque, Ia.**

Oct. 3-7—**American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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*Abstract of address delivered before Bus Division, American Automobile Association, Philadelphia, June 15, 1927.

Bus development can only come as we have regulation based upon the following principles:

Varying standards of rates.

Liberal policies with respect to development of new lines.

Sympathetic co-operation on the part of regulating bodies with respect to flexible schedules, so adjusted as to give necessary service with a minimum of waste.

Protection of existing lines of one type against interlopers of the same type, so long as public service requirements are met.

In short, regulation which considers first the needs and desires of the public, and second, the interests of the carriers.

I do not say there should be no regulation. But I do believe that such regulation as may be adopted should be based upon the differences, as well as the similarities, which exist between rail and highway operation.

The bus industry is young. It is virile and growing. It will grow faster and on a more substantial basis if those interested in its development keep constantly in mind that the public interest should have first consideration. And in this connection one should not overlook the interests of the public in existing rail carriers.

I am not one of those who believe that if a rail carrier has adequate physical facilities to carry passengers over a given route the public should be denied the use of the bus if it wants and is willing to pay for that form of transportation. In such instances regulating bodies should determine to what extent the rail carriers may add or substitute bus for rail service, or grant franchises to an independent operator. The carrier—whether rail or highway—should be protected against destructive and uneconomic competition so long as it properly serves the public.

With respect to taxation—the bus, like any other highway unit, should pay a fair charge for its use of the public highway. It is doing so today, as government figures prove.

Unfair and punitive taxation levied against the bus will be reflected in increased cost to the consumer of highway transportation.

Remember that the bus is in its infancy; it has been in existence only a few years; it has a field all its own; it renders a character of service different from, and not furnished by, rail carriers.

If these principles are kept constantly in mind, the independent operator and the rail carriers will find a broad basis of co-operation to the mutual advantage of both.

International Association Holds Convention This Week

THE fourth annual convention of the Internationaler Strassenbahn und Kleinbahnverein was held this week in Copenhagen, Denmark. The members of this association are electric railway and bus lines in Central Europe, and its headquarters are in Vienna. Sessions were held each morning this week from Monday to Wednesday inclusive, and Thursday was devoted to a trip to neighboring points of interest. A list of the technical papers presented follows:

"The Effect of the Sorbitic Treatment on Rail Life."

"Problems of City Operation in Sweden."

"Disturbances to Radio Broadcasting."

"Bases for Operating Statistics."

"Car Cards and Other Advertising on Street and Interurban Railways."

"Economies in Local Railway Operation."

"Methods of Trans-shipment of Freight Between Main Line Railroads and Motor Trucks."

"Co-ordination Between Main Line Railroads and Motor Trucks from the Standpoint of the Public."

"Co-ordination Between the Motor Bus and Street Railways in Large Communities."

"Co-ordination Between Bus and Truck Operation and Interurban Railways."

"Recent Improvements in Carhouse and Repair Shop Practice of the Copenhagen Street Railway, with Special Reference to Brake Inspection and Painting."

"Improvements in Car Speeds in City and Interurban Service."

It is understood that at the Copenhagen meeting consideration was to be given to the question of the consolidation of the association with the street and interurban railway and bus association of western Europe.

American Association News

Power Transmission and Distribution

FINAL reports of sub-committees and decisions to clean up this year's work formed a busy two-day session of the power transmission and distribution committee which was held at association headquarters, New York City, on June 16 and 17. Those present were F. McVittie, chairman; J. Walter Allen, W. H. Bassett, M. W. Cooke, J. H. Drew, J. C. Damon, C. L. Hancock, S. S. Hertz, K. J. Keith, A. J. Klatte, J. Leisenring, H. S. Murphy, J. F. Neild, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger, R. D. Wade, C. H. Jones, sponsor, and H. C. Casey representing G. F. Wennagel.

A number of new subjects of interest to power transmission and distribution engineers were suggested for consideration by ensuing committees. Sub-committee No. 1 on review of existing standards reported some desirable changes and recommended that the specifications of electric conduit construction be referred to next year's committee, also that lightning protection on car and line equipment be studied by a special committee.

Sub-committee No. 2 on specifications for catenary material presented a progress report that was adopted and will be reprinted in this year's proceedings. Changes were suggested as a basis for revising these specifications.

Sub-committee No. 3 on trolley wire wear reported that the work of the last two years will be brought up to date and that tabulations and graphs will be prepared for comparative purposes. Mr. Murphy, chairman of the committee, presented a design for a measuring device for trolley wire.

Sub-committee No. 4 on specifications for high strength trolley wire reported that a compromise with the A.S.T.M. committee on specifications for high strength trolley wire has been reached. If this recommendation passes both the A.E.R.A. and the A.S.T.M., a final specification will be in effect.

A report was presented by sub-committee No. 5 on radio interference to the effect that this sub-committee be combined with the inductive co-ordination sub-committee in order to furnish information that may be desired regarding reports of interference. Sub-committee No. 6 on inductive co-ordination reported that no definite developments have taken place during the year and so a progress report only can be made.

A recommendation from sub-committee No. 7 on feeder ties between automatic substations was presented to the effect that the subject should be discontinued.

Sub-committee No. 8 on comparison of operating methods and sub-committee No. 9 on trolley wire reels presented progress reports.

A.E.R.A. Reports in Preparation

SPECIAL reports are being prepared by the Bureau of Information and Service of the American Electric Railway Association, and will be available upon request by member companies, as follows:

Bulletin No. 144.—*Operating Costs of Electric Railway Motor Bus Lines,* 1926.—A summary of the operating costs of 140 electric railway bus undertakings in 1926 and a comparative study of the operating costs of 102 bus operations in 1926 and 1925. The operations have been classified as city, interurban, or combination city and interurban service. Details of average operating expenses are given for each group and the depreciation methods adopted are analyzed and presented in tabular form.

Bulletin No. 145.—*Comparison of Electric Railway Operating Conditions, Operating Expenses and Results of Operation on Various Unit Bases.*—This is a tabulation of comparative unit figures and ratios derived from the operating reports of electric railways in 1926. The cities are grouped according to their population and there is shown for each city the riding habit, average speed, number of revenue passengers, car-miles per mile of track and per car operated, revenue per mile of track, operating ratio, number of passengers per car-mile, proportion of passengers using transfers, cost of maintenance of plant and equipment per car-mile, per unit of property maintained and in per cent of total operating expenses. The operating expenses as distinct from maintenance expenses are also given on comparative unit bases and in per cent of total expenses.

Bulletin No. 146.—*Accident Prevention and Safety Work of Electric Railways.*—Gives a list of companies carrying on accident prevention or safety work and shows the type of accident prevention work done and what these companies think of its effectiveness. The types of safety work covered are bonus awards to trainmen, competing contests, safety campaigns, organization of safety committees, employment of safety engineers, etc.

The News of the Industry

Fare Increase Accepted in Buffalo

International Railway Makes Statement in Which It Enters Plea for Public Support

Formal acceptance has been noted by the International Railway of the order of the Public Service Commission increasing the rate of fare in the city of Buffalo from 8 cents, with two tokens for 15 cents, to 10 cents with three tickets for 25 cents. The company has assured the commission that it welcomes the opportunity to proceed with track and paving reconstruction. As the opinion of the commission points out, the extensive program set up by the city cannot be completed in one season, nor can the company undertake it without revenues. In the memorandum of acceptance to the commission President Yungbluth said:

While at this time the International Railway has no desire to make any further statements in regard to its expectations from the new fare, it feels that it can do no less than again call attention to its letter of June 8 to the commission. In view of the facts therein set forth, it is obvious that the International Railway can make no further promise than that which it now gladly makes, that although it believes the additional revenue in 1927 will be only $150,000, during this period it will spend $250,000 for track and paving reconstruction. Materials will be ordered at once. The earliest delivery procurable is about Aug. 15, at which time this work will commence. Track and paving reconstruction this year will be done on streets approved by the public authorities.

The opinion of the commission further points out that prolonged and bitter controversy and litigation between city and company advantage neither. In the hope of ushering in the dawn of a new era the International Railway is willing to co-operate with the city, by settling at once all litigation, so that this new fare may have a fair trial under the most auspicious circumstances. Furthermore, the company will gladly enter into conference with the city, as suggested by the commission. The railway also again restates its readiness to serve the public convenience by starting bus lines in accordance with the plan agreed upon by the city, the business organizations and the company, and repeatedly demanded by citizens in the districts to be served.

Since the International Railway will devote this year more money to the reconstruction of track and paving than it believes will be produced by the new fare, it is hoped that the public will support this program by increased riding.

The letter of June 8, to which reference was made, follows:

Newspapers have recently indicated that the Public Service Commission may authorize an increased fare of 10 cents cash, three tickets for 25 cents, coupled with the requirement that the company this year undertake a track reconstruction and paving program of more than $900,000.

Upon the granting of any additional fare, the people of Buffalo, assuming the proceeds to be sufficient to meet the necessities, would expect the company to commence a substantial reconstruction program. That is the outstanding thing in the public mind.

The following facts are again brought to the attention of the commission lest by any utterance or order it should create in the public mind hopes and expectations which are beyond the power of the company to fulfill.

The additional revenue from such a rate of fare is by International Railway traffic engineers optimistically estimated at $300,000 a year. This is based upon a loss in riding of 7½ per cent under 1926. As the company is already experiencing a loss of 6 per cent under last year, a fare of 10 cents cash, three tickets for 25 cents, will produce revenue equal only to that of 1926.

Nearly nine months ago the railway petitioned the Public Service Commission to grant in the city of Buffalo increased car rates—a straight 10-cent fare. The outstanding circumstances demonstrating the necessity were stated. Briefly they are:

The International Railway has shown a loss each year from 1918 to 1925.

The International Railway stockholders have received no dividend since 1918, but have contributed $4,140,445 to the company.

There is an increasingly insistent demand for street repaving and track reconstruction. The cost to the company in Buffalo alone for such work, now pressing, exceeds $2,000,000. Additional reconstruction will be required from year to year, in the future.

The company desires to do this work, but can do it only as fast as the commission makes available the additional revenue necessarily required.

Master Celebration Staged by New C., H. & D. Railway

Old Equipment Burned Before Public Assemblage as Final Act in Program of Complete Rehabilitation of Ohio Interurban—Celebration Preceded by Dinner in Company's Shops

From 10,000 to 20,000 people gathered on the evening of June 22 in a natural amphitheater just north of the new Moraine shops of the Cincinnati, Hamilton & Dayton Railway and cheered as the flames fed by the 30-year-old electric railway cars lighted up the countryside.

The event was staged by the railway in celebration of the completion of a rehabilitation program costing nearly $2,000,000. This included the acquisition of a new steel and concrete shop building at Moraine, extensive additions to freight terminal facilities, purchase of an entirely new complement of 40 C.E.R.A. standard box cars with necessary locomotives, overhauling of the power transmission and distribution system, including the construction of eight full automatic substations, and practically complete substitution of new de luxe cars for all of the company's former interurban and city equipment.

New de luxe city cars built for the road by the Cincinnati Car Company for service at the Dayton end of the line have been in operation for six weeks and have already shown an increase in passenger revenue of 13 per cent over the six weeks prior to their installation, or 20 per cent increase in comparison with the corresponding period of last year. Delivery of ten new interurban cars by the G. C. Kuhlman Car Company marked the arrival of the last of the new equipment for the property and was the occasion for the community celebration to mark the beginning of a new era on this road through the Miami Valley, which has had a career of financial difficulties, lapsed leases, foreclosures, receiverships and legal battles.

One Car for Each Community

An old, decrepit car for each important town along the line was drawn up in the center of the field where the celebration was staged. The mayors of each of these cities touched in rapid succession the seven buttons which set the spark to the fire that spelled the end of run-down equipment and old-fashioned methods. Through an elaborate outdoor amplifier system Dr. Thomas Conway, Jr., president of the railway, whose imagination, faith and courage were responsible for the rebirth of the interurban railway, explained to the thousands within hearing of his electrically magnified voice the significance of each step in the program and the plans and hopes of the railway for the future.

Great Public Interest

Under cover of protecting darkness, all of the company's new interurban equipment had been lined up on the railway embankment above the heads of the gathering. As the flames from the rapidly consumed cars in the fire began to subside floodlights properly located in the field and suddenly switched on threw their rays full on the new cars, which shone in the darkness before the eyes of the large crowd.

Sirens and bells on the cars were sounded as a fireworks display burst in brilliant rockets and bombs far up over the heads of the crowd and a set piece announced in glaring letters the birth of "A New C., H. & D. Railway."

For nearly half an hour the display continued while the old cars burned themselves, until only the frames stood revealed like a skeleton. Train crews on the new cars above, in carefully groomed and pressed uniforms, clanged their gongs and yanked at the control cords of the sirens.

So great was the throng thus attracted to celebrate the rebirth of an interurban railway that every approach to the site of the spectacle was jammed with automobiles for hours preceding and following the event. The elaborate parking facilities provided were taxed to capacity. In addition, roadsides and vacant bits of property in every direction were jammed with cars while their owners sought a view of the strange spectacle presented by the burning of cars which they had seen daily since childhood and had come to look upon as inseparably associated with the idea of an electric railway ride.

PRECEDED BY DINNER

The public celebration was preceded by a dinner in the company's new shop and office building to more than 400 guests, comprising the prominent public officials and leading business men of the Miami Valley, security holders and officials of the railway and visiting executives from many other railway properties. These men came from various cities along the line in special cars and were permitted to inspect the property before attending the celebration. During the dinner President Conway reviewed the history of the property and described the extent of the rehabilitation program. He summarized the aims of the new management and made a strong plea for the active public co-operation and support so necessary to the success of the ambitious project which had been undertaken.

As the various special trains decorated with banners announcing the celebration proceeded through the communities along the line the population turned out in force.

Chicago Enabling Legislation Encounters Opposition

Chicago's five traction bills, after passing the state Senate with votes to spare, have encountered some little opposition in the committee of the House of Representatives, to which they passed from the Senate. Politics, both state and municipal, and newspaper criticism have been unusually heated in the controversy which has developed.

A number of amendments have been submitted to the committee which is considering the bills and a special meeting of the Chicago City Council resulted in an almost unanimous approval of these proposed changes. The representatives of the companies have not signified their approval of the amendments, at the present time, and it is considered doubtful that they will accept them. Among the changes proposed are:

Change in the indeterminate franchise bill to limit a franchise to a 40-year period and only in excess of twenty years upon a referendum vote.

Changing the bill giving the elevated lines power to merge the various transportation companies in Chicago so that any of the companies might carry out the consolidation.

Amendment of the bill creating a commission with authority over the transportation companies composed of state, county and city appointees so that a majority of the members of the commission will be city appointees.

Explicit definition of the terms "non-user" and "mis-user" used in one of the bills.

The Chicago Aldermen were loud in their demands at the meeting for home rule to its fullest extent. One of the City Council declarations on the amendments, showing clearly their stand on the bills, read as follows:

> We declare that if the bills are not amended, or if they are left in the unfair condition in which they passed the Senate, then the resulting legislation will not be enabling, but will be so obstructive that this body will be unable to make use of the legislation in attempting to solve the railway problem.

A committee of Aldermen was dispatched to the state capital to present these demands before the transportation committee of the House.

A statement setting forth the concise stand of Samuel Insull, head of the elevated lines, in the question was issued by him to the newspapers.

New York City Would Recapture Rapid Transit Lines

Columns of space have been devoted by the New York newspapers to the discussion of the tentative unification plan for New York City rapid transit lines proposed by the Transit Commission and the Board of Transportation. Reduced to their simplest terms the plan contemplates the purchase by the city of the Interborough Rapid Transit and Manhattan Elevated and recapture of the Brooklyn-Manhattan Transit Corporation's subway line. The city would buy Interborough stock at 30, guarantee 2½ per cent on Manhattan modified guaranteed stock, or as alternative pay 50 a share, exchange the city's 3 per cent bonds for $154,000,000 of I.R.T.'s first and refunding 5s, $34,000,000 of city 4 per cent bonds for $34,000,000 of Interborough's ten-year 7 per cent gold notes, and city 3 per cent bonds for I.R.T.'s $10,500,000 ten-year 6 per cent notes. The reduction in fixed charges on I.R.T. and Manhattan under this plan would be $7,500,000. The cost to recapture the B.-M.T.'s subway lines would be $52,728,000. Samuel Untermyer, special counsel for the commission, is said to have held conferences with members of J. P. Morgan & Company representing Interborough bondholders. The plan would merge the I.R.T. and B.-M.T.'s recapturable subway lines with the new city system now being constructed. A corporation would probably be formed to operate the new system, with the city having a substantial representation on the directorate.

Twenty-five Year Men Gather

The fifth annual reunion of the 25-Year Club of the East St. Louis & Suburban Railway was held recently in East St. Louis, Ill. The business meeting was in the office of President W. H. Sawyer, an honorary member of the club, and at this gathering fifteen new members were admitted and resolutions of respect to the memory of John Burke were adopted. Following this gathering the club members traveled in company buses to Loew's State Theater in St. Louis, Mo. After the show dinner was served at the Missouri Athletic Association. The place cards were checks for $25 each. Two of the charter members of the club are dead, but eight others were present. One of the honorary members of the club is dead, but the others present were W. H. Sawyer and F. E. Allen. Nine of the men admitted to membership May 18 are motormen, one a division superintendent, one an assistant superintendent of transportation, one a bus operator, and two are conductors and motormen.

Municipal Railway Proposed to Be Resubmitted in San Francisco

City officials of San Francisco, Cal., are shaping plans for another bond election in November linked with the regular municipal election, at which the Municipal Railway extensions and the Spring Valley purchase, defeated at the recent election, will be submitted again. As things stand now the city is faced with the problem of a municipal railway tunnel and no money to run the railway through it, the same situation with respect to the Bernal cut and no place to put Hetch Hetchy water when it arrives.

City Engineer M. M. O'Shaughnessy is reported to have said:

> The results on the Spring Valley and railway issues showed clearly that the people of San Francisco are in favor of these projects. Both received a substantial majority, but by reason of the light vote failed to receive the two-thirds majority required for bond projects. They should be resubmitted at the earliest opportunity.
>
> We now have a tunnel with no funds to finish the railway. A portion of the line can be laid, but it cannot be completed. There is no money to purchase the rolling stock, and no place to put it if we buy it. We cannot borrow equipment from other municipal lines as all are used to capacity.
>
> As to the Bernal cut, for which the people voted $1,400,000 bonds, we will proceed at once with the construction of both the vehicular roadway and roadbed for the railway tracks. But by failure to pass the railway bonds the voters leave us without funds to lay the tracks.
>
> Our plans are drawn for the cut, we have purchased $250,000 in rights-of-way, and will begin actual excavation in 90 days.

Unusual Turn Taken by Seattle Suit

Litigation over the question of the priority of the Seattle Municipal Railway purchase bonds came to a sudden but temporary halt in the federal court recently when the clerk of the court signed a *pro confesso* order on motion of the Puget Sound Power & Light Company in the suit of John G. Von Herberg against the city of Seattle, Wash., and its financial officers, in which suit the newer company had appeared as a cross-defendant. The order, however, is subject to suspension, alteration or rescinding by the trial court, on a proper showing. In a cross-complaint the power company had contended that before the transfer of the railway to the city the Twichell case was carried to the State Supreme Court and the contract held valid, giving the bondholders a first lien on gross revenues of the system. Mr. Von Herberg had attempted to have labor costs adjudged the first lien.

In the motion of the *pro confesso* order the power company recited that Mr. Von Herberg had failed to answer, plead or demur to the cross-complaint within 30 days, as required under the court rules. The order simply means that by his failure to make an answer Mr. Von Herberg is held to acknowledge that the allegations of the cross-complaint are true and that the bondholders have first lien against revenues.

The fact that the court can set aside the order or alter it leaves the way open for further proceedings, but the present status of the litigation in the federal court is that the power company has won its contentions and Mr. Von Herberg is eliminated.

Wage Negotiations in Chicago in Final Stage

Negotiations on the wage question between representatives of the union of surface lines and elevated trainmen and company officials in Chicago entered their final stage during the week ended June 18, when meetings to talk over the demands of the men were held by officials of both transit organizations.

At a referendum of the surface lines men the union officials were clothed with authority to declare a strike unless the demands of the men were met by the company. The poll resulted in 162 voting against the matter of clothing the union officials with authority to act for them, out of a total of 11,961 votes cast. The elevated employees vote resulted in nearly as overwhelming a majority in favor of the same proposal.

Both unions are asking a wage increase of 15 cents an hour, the present scale on the surface lines being 75 cents and on the elevated 77 cents. In addition the surface lines men ask a paid insurance policy of $1,000. Surface lines men, it is said, have agreed not to compromise on an increase of less than 5 cents an hour, bringing their scale to 80 cents and restoring a 10-cent cut made in 1922, when fares were reduced from 8 to 7 cents.

Changes in working condition are also asked by the two unions.

William D. Mahon, international president of the union, has been in Chicago for the past week, taking an active part in the negotiations.

Officials of the Surface Lines point to the federal receivership under which they are operating as militating against any wage increase. The company is also operating under temporary franchises.

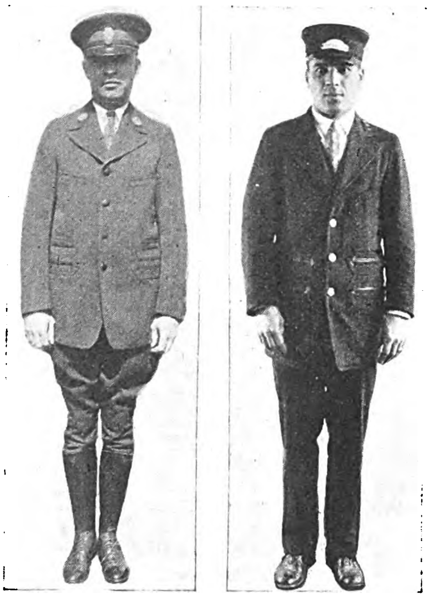
Tacoma Marking Time on Fares and Transit Report

In order to hasten the time when the Tacoma Railway & Power Company, Tacoma, Wash., may submit a written answer to the report of Kenneth G. Harlan, city utilities engineer, upon the operations and finances of the company, submitted some six weeks ago, the City Council has authorized Mr. Harlan to confer with the company accountants about the figures from which he made certain deductions. Richard T. Sullivan, manager of the railway, told the Council the company can have a written answer ready within 60 days. Mr. Harlan recommended to the Council that no attempt be made to discuss his report with company officials until after an answer in writing had been made by the company and he had had time to reply to this. The discussions could then be directed better. Mayor M. G. Tennant indorsed this.

The question of the fare basis to be used in the 60-day period allowed for the company reply has been left open for a meeting to be held on June 28. Mr. Harlan reported that the average fare under the new fare basis, with the weekly ticket at 30 cents, allowing rides at 5 cents, tokens at three for 25 cents and 10-cent cash fares, was 7.4 cents for the weeks examined. He estimated the increased income for the company at 6 to 7 per cent. The possibility of reducing the ticket to 25 cents has been discussed, but it is felt that data are still too meager to permit a decision. The present schedule will expire on July 2.

Outfits of New Design for New Jersey Men

Railway and bus operators of the Public Service Railway and the Public Service Transportation Company, Newark, N. J., are soon to be attired in natty new uniforms of a design and color entirely different from those now worn. The change is to become effective at once for new men entering the service and will be adopted by present employees as their old uniforms wear out and they buy new ones.



The new and the old on the Public Service Railway

The familiar blue uniform will give way to a uniform of heavy whipcord, olive green in color. The official Public Service design will be embroidered on each side of the collar. Breeches and black puttees or long trousers will be worn.

An innovation is the adoption of an army officer's style of cap, of the same material as the coat and breeches, but with brown visor and strap. A nickeled silver badge of attractive design will replace the enameled badge now worn on the cap.

Temporary Fare Increase Denied in Los Angeles

The Los Angeles Railway, Los Angeles, Cal., was denied a temporary increase in fares to 6 cents by the state Railroad Commission on June 20. This request was made by the company pending a decision on its application for a permanent 7-cent fare to replace the present 5-cent fare. The application for the permanent 7-cent fare is scheduled to be heard by the commission on Aug. 9.

Rehearing Ordered on Albany Fares

The Public Service Commission of New York on June 23 ordered a hearing on the application for a rehearing filed by Albany, Troy and other municipalities on the order of the commission made on June 14 increasing fares on the lines of the United Traction Company. The hearing will be held at Albany on June 28. The new tariff goes into effect July 1.

Injunction Against Birmingham Rerouting

A temporary injunction has been granted restraining the Birmingham Electric Company, Birmingham, Ala., from abandoning its Avenue C line, in accordance with the provisions of the traffic survey of Ross Harris, traffic expert. The petition was filed by an attorney acting for property owners along the line. J. S. Pevear, vice-president of the company, says that the Birmingham Electric Company "is merely carrying out the traffic survey, and this injunction will have no effect on the remainder of the traffic survey, which will go into effect June 26." Under this traffic survey a number of railway lines are to be rerouted, especially in the downtown loop section. The city is not made a party to the suit.

Department Store Owners Warned of Parking Menace

Unless drastic steps are taken to improve traffic conditions in Chicago and other large cities, the time will soon come when the inconveniences to shoppers will be so great that they will be virtually prevented from entering downtown shopping and business districts.

That is the opinion of Miller McClintock, director of the Albert Russel Erskine Bureau of Street Traffic Research, as given to members of the National Retail Dry Goods Association at their convention in Chicago, recently.

Mr. Mitten Not to Participate in Brotherhood Banking

Dr. A. A. Mitten, vice-president of Mitten Management, Inc., sent the following telegram on June 24 to William B. Prenter, president of the Brotherhood of Locomotive Engineers, at Cleveland, Ohio:

> The apparent impossibility of there being a sufficiently unanimous accord of the convention in approval prompts us now to request that the proposition by which our organization agreed to assist in the development of your banks and at the request of your advisory board, Mr. Mitten personally act as trustee in the working out of the venture and your other slow assets over an extended period be now withdrawn from further consideration by your convention.

It had previously been reported in the daily press that negotiations were under way between the Thomas E. Mitten interests of Philadelphia and the Brotherhood of Locomotive Engineers, looking toward a consolidation of the banking and financial interests of the brotherhood with the Mitten "men and management" interests.

Franchise Agitation Renewed in Omaha

Agitation has been renewed for another election to determine the status of the Omaha & Council Bluffs Street Railway with respect to the future franchise in Omaha. Business men feel that the city's standing abroad would be helped by a new franchise with definite limitations rather than to allow the matter to hang on until the federal courts have passed on the application of the trustee for the bondholders to have the franchise declared perpetual. A counter proposal by a group headed by Former Mayor Ed P. Smith is that no franchise be granted until the company agrees to sell to the city the bridge over the Missouri River across which its cars operate between the two cities and on which a large and profitable vehicular traffic is handled on a toll basis.

The city wants a free bridge. Under a law shortly to become effective the city would have the right to buy or build one, if the voters so authorize. Mr. Smith urges that the city buy the company bridge instead of building a competitive structure. The railway is understood to be reluctant to divest it of ownership of the structure, particularly in view of the present unsatisfactory earning status of its railway lines.

Valuation Figures for Louisville Expected Soon

The valuation of the property of the Louisville Railway, Louisville, Ky., now being completed by John A. Beeler, New York, is expected to be ready on July 15. This valuation will become the basis on which the Board of Works will regulate fares, under the franchise granted on Sept. 21, 1926, in which it was agreed that the city, through the Board of Works, would arrange for the appraisal of the properties.

Broadcasts Safety and Courtesy

The Nashville Railway & Light Company, Nashville, Tenn., has started a summer series of broadcasting hours through its school for safety and courtesy. Brief outlines of work being done by the railway and light department in furthering these desiderata among its employees were given by J. P. W. Brown, vice-president and general manager; Superintendent Davis of the railway, and W. A. Brown, safety director of the company. The programs, including musical numbers, will be broadcast every two weeks.

$143,175 Verdict Awarded in Washington Case

The Washington Railway & Electric Company, Washington, D. C., has been awarded judgment by Chief Justice Walter I. McCoy in the Circuit Court against the Washington, Baltimore & Annapolis Electric Railway for $143,175 and interest as the amount due under an operating agreement between the two roads by which the Annapolis company uses the tracks of the Washington company. Neither road is satisfied with the verdict, as both noted appeals to the Court of Appeals. The Washington company sued for $275,000. The Annapolis company admitted owing only $15,440. The case was tried twice without a jury. Justice Hoehling heard the case the first time and ordered a retrial without deciding any of the issues.

Boston Looks Ahead to Fall Courses

Opinions are many and honest in *Co-operation* on how the educational courses conducted by the Boston Elevated Railway, Boston, Mass., are regarded. In the May issue of this paper many comments are printed which speak for themselves. This forum is considered of value not only in regard to the action of the committee on education for next fall's program but also in assisting employees to choose courses best suited to their needs. In the discussion the chief electrician, maintenance department, has something to say about "Investing Savings"; the foreman, armature shop, expresses his views on "Foreman Conferences," and the general storekeeper passes judgment on the course in "Public Speaking."

Wage Negotiations in Connecticut

Proposals made by employees of the Connecticut Company, New Haven, Conn., for a wage of 75 cents an hour for operators of two-man cars and 15 cents additional for operators of one-man cars have been rejected by the Connecticut Company. The company has likewise rejected the proposition that the working schedule be fixed at eight hours a day instead of nine. It is considered likely that the men will continue their conferences and submit a compromise proposition.

President Punderford told the committee that the company could not afford to grant the raise in wages. It has paid no dividend since 1916 and is reluctant to increase fares, a contingency that could hardly be escaped under any upward revision of the wage scale.

"Low-Cost Riding"

In an eight-page pamphlet which it has issued the Beaver Valley Traction Company, New Brighton, Pa., sends a message to its patrons on the elements of low-cost riding yesterday and today. According to this company, Dad will tell you how the coming rails made low-cost riding possible. Now, according to this booklet, the question is being asked, will the street cars be replaced by the bus? The Beaver Valley Traction Company management states that as an auxiliary to the street car the bus is proving its value, but for carrying large crowds quickly and economically the street car is indispensable. The bus and railway management in the Beaver Valley territory is bound by the closest co-operation and its common end is to give the people of the Beaver Valley district a transportation service which is as near perfect as anything can be which is humanly operated.

Foreign News

Faster Cars in London

The Metropolitan Electric Tramways, which operates an extensive system in Middlesex and has a through running arrangement over the northern lines of the London County Council Tramways, London, England, has begun to equip its cars with new motors capable of giving a maximum car speed of 30 m.p.h., but the highest speed allowed by the Ministry of Transport is 20 m.p.h. This is an increase of 4 m.p.h. on the formerly permitted maximum. Increase in average speed will be aided by more rapid acceleration and by the abolition of a number of stopping places.

Rail and Road Competition in Britain

Transportation on the highways in Great Britain of motor vehicles carrying both passengers and freight has become so enormous as to be severely competitive with the railways according to a recent appeal of railway representatives. As a result of this increased traffic, a committee representing the main railways of Great Britain and three trade unions of railway employees, laid before Winston Churchill, Chancellor of the Exchequer, a weighty memorandum appealing for more parliamentary control over the highways. The government, Mr. Churchill said, is considering the question of block grants instead of percentage grants for road maintenance. And he pointed out that last year's budget showed by increased taxation on road motor vehicles that measures had been taken to meet the request of railway representatives.

Tramways' Overhead in England Goes to Relief of Taxpayers

Tramway revenue of £207,000 for the last 25 years has been contributed by Newcastle-on-Tyne toward tax relief of the community. The amount received for the last several years has been £14,000, meaning a reduction of 1½d. per £1 on the taxes. It has been the ambition of municipal tramway authorities in all England to make profits substantial enough to reduce the local taxes levied on the various communities. Most of the tramways, however, instead of showing a profit are working at a loss, and it is believed that this year's showing, especially, is dubious because of the general effect of the coal strikes during 1926.

Net Income Lower.—For the year ended Dec. 31, 1926, the gross revenue of the Berlin Electric Elevated & Underground Railways, Berlin, Germany, was $7,171,973, against $5,730,242 in 1925. Expenses and taxes increased from $3,024,430 to $4,031,296 in 1926. After the consideration of depreciation and amortization, the net income for 1926 was $1,743,599, against a net in 1925 of $2,021,785.

Recent Bus Developments

Railway and Coach Terminal Opened at Michigan City

A new $200,000 union station for the joint use of motor coach and electric railway passengers was formally opened at Michigan City, Ind., on May 21 by the Chicago, South Shore & South Bend Railroad and Shore Line Motor Coach Company. The dedication of the big structure attracted a throng of more than 12,000 persons from all parts of northwestern Indiana and southwestern Michigan. The station project, including an inclosed motor coach loading shed and a large modern brick and steel garage adjoining, represents an investment of more than $200,000.

The station proper has a handsome façade of buff-colored terra cotta, with side walls of brick and large plate glass windows and revolving doors. It is a two-story structure, the floor above the main waiting room providing office space for officials of the motor coach company. The interior of the station is finished in light colors, with marble columns and attractive trimming. A luxuriously furnished ladies' lounge and large smoking rooms for men are located adjacent to the waiting room.

A steel-canopied loading shed, accommodating nine large motor coaches at one time and affording protection to passengers in inclement weather, is directly connected with the waiting room. The terminal is so arranged that motor coaches will always be kept off the public streets when receiving or discharging passengers.

The garage provides space for the servicing and storing of 30 large motor coaches, with three repair pits, a storeroom for tools and materials and other necessary facilities.

The station was rushed to completion in the record time of twelve weeks in order that it might care for the heavy increase in rail and motor coach traffic during the summer months. The new station will be used as a transfer point from train to bus by thousands of persons traveling between Chicago and the Michigan resort region.

Service Between Dallas and Fort Worth

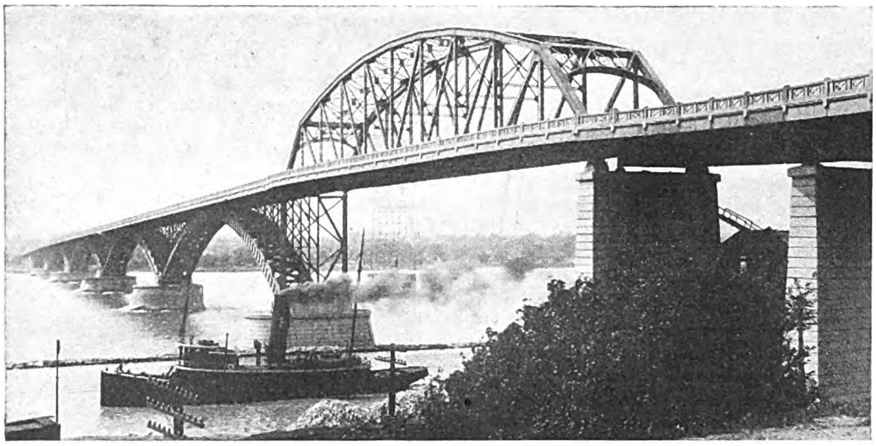
Alfred F. Townsend, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., announces that his company is to start bus service between Dallas and Fort Worth supplementing the regular interurban railway service. The new service is to be instituted as soon as a permit is granted by the Texas Railroad Commission, authorized to supervise and regulate bus service in Texas under the statute which went into effect on June 14. Mr. Townsend's company will purchase ten parlor buses, at a cost of about $10,000 each, and will operate these buses on a 30-minute schedule daily from 6:30 a.m. to 8:30 p.m. Bus terminals will be erected in both Dallas and Fort Worth, probably in connection with the interurban terminals. It is to meet growing bus competition between the cities that the new service is to be established.

Decision Expected in Louisville Case

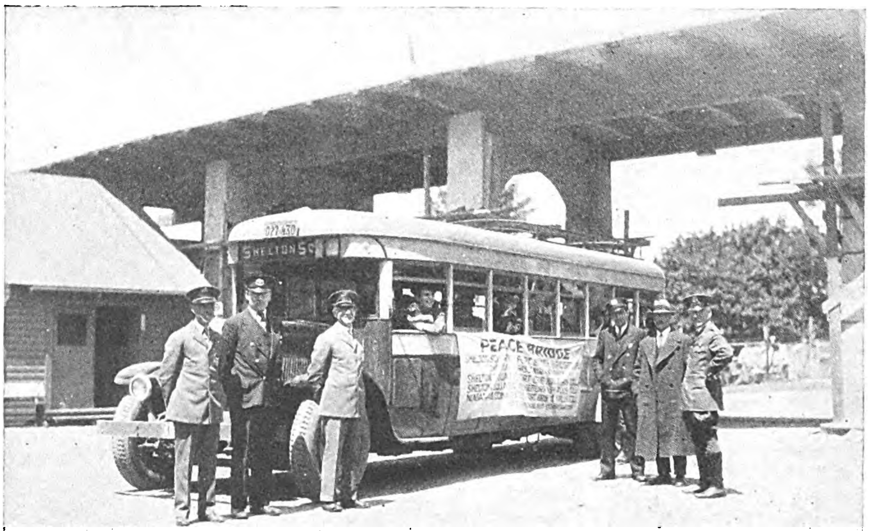
A decision is expected shortly in the case of the Peoples Transit Company, a bus operating organization, against the Louisville Railway, carried by the former to the Court of Appeals, after the Jefferson County Court held that the railway had the passenger carrying franchise over streets on which it has railway lines in Louisville. It will be recalled that an injunction was secured against the Peoples company restraining it from operating bus lines in competition with the railway and stopping the buses after they had started. The case was carried to the upper court some months ago. In the meantime the Peoples company is at a standstill.

Buses Running Between Buffalo and Port Colborne

With the formal opening of the new $4,500,000 Peace Bridge across the Niagara River connecting Buffalo with Fort Erie, Ont., the International Bus Corporation, a subsidiary of the International Railway, Buffalo, started a new bus line between Shelton Square at Buffalo and Fort Erie Plaza at Fort Erie, Canada. Eventually, the International Bus Corporation will operate an interurban line between Buffalo and Port Colborne, Ont. Ten-minute service is being maintained on the new Peace Bridge bus route. Only through passengers can be carried on this line as the company has no franchise to operate the line in the city of Buffalo. By entering Canada, the new bus line does not come within the jurisdiction of the New York State Public Service Commission. De luxe gas-electric buses carrying 27 passengers are being operated on the new interurban division into Canada. The fare from Shelton Square to Fort Erie Plaza is 20 cents each way, of which 10 cents represents the bridge toll and goes to the Buffalo-Fort Erie Bridge Corporation. Ferry service formerly handled the traffic across the river at Buffalo.



New Peace Bridge over which International buses operate



De luxe bus at American approach to Niagara bridge

Financial and Corporate

Merger Plans Maturing in Indiana

The proposed consolidation of the Central Indiana Power Company and Terre Haute, Indianapolis & Eastern Traction Company and certain of their subsidiaries into the Indiana Electric Corporation involves the readjustment and exchange of five bond issues and six stock issues now outstanding in the hands of the public. The face value of the bonds to be readjusted is about $11,900,000 and par value of stocks $27,600,000, or a total of $39,500,000.

All these issues are represented by committees, which have designated depositaries and asked for deposits. The percentage of bond issues deposited at latest reports ranged approximately from 60 per cent to 90 per cent. Five stock issues deposited range from 63 per cent to 95 per cent. About 50 per cent was deposited of the sixth issue, one of the three smaller stock issues. The average percentage deposited by holders of all eleven stock and bond issues was 83 per cent.

A plan and agreement for the consolidation has been drawn up in complete form and has been submitted to the eleven committees, most of which have already taken favorable action. If all committees approve and their decision is accepted by sufficient depositors the agreement will go before the Public Service Commission of Indiana. If that body approves it and consolidation is effected, material benefits are expected therefrom, since one company has ample generating facilities and favorable power contracts, while the other has a load in excess of its efficient generating capacity.

The Indiana Electric Corporation when formed will be a subsidiary of the American Public Utilities Company, of which Samuel Insull is chairman and Martin J. Insull president.

Kansas City Securities Being Distributed

Notice has been given that the new securities are ready for distribution provided for in the plan and agreement dated June 1, 1925, for the reorganization of the Kansas City Railways, Kansas City, Mo. As provided in the plan, a new corporation, named the Kansas City Public Service Company, has been organized under the laws of Missouri and has acquired the properties and assets in the state of Missouri of the Kansas City Railways. The Missouri corporation also owns all bonds and stocks (except directors' qualifying shares) of the Wyandotte Railways, its Kansas subsidiary corporation, which owns the fixed physical property in Kansas. The railway property in Kansas is leased to the Missouri corporation, which conducts unified operations over all lines. A new railway franchise, extending to Jan. 1, 1957, has recently been granted to the Public Service Company by the city of Kansas City, Mo., upon terms believed to be fair and just to the company and the city.

The Kansas City Public Service Company has an authorized capitalization of 150,000 shares of non-par prior preferred stock, 250,000 shares of non-par preferred stock and 250,000 shares of non-par common stock. It has issued, as provided in the plan, 83,364 shares of preferred stock, series A, and 182,645.4 shares of common stock, plus an additional 1,000 shares of common stock issued at time of incorporation. The company has also executed a mortgage and deed of trust, dated July 1, 1926, upon its property and has issued thereunder, as provided in the plan, $12,465,200 principal amount of first mortgage 6 per cent gold bonds, series A. Issuance of these securities has been approved by the Public Service Commissions of Missouri and Kansas. The preferred and common stocks of the company (except directors' and inspectors' qualifying shares) have been deposited under a voting trust agreement extending for five years from July 1, 1926, the voting trustees being Melvin A. Traylor, J. K. Newman, William G. Woolfolk, George W. Davison and Powell C. Groner.

Volume of Business Grows

Six Per Cent More Passenger Traffic Carried on Chicago Rapid Transit Lines in 1926—Net Income Greater—Property Being Used More Intensively

THE business of the Chicago Rapid Transit Company, Chicago, Ill., in 1926 exceeded in volume that of any previous year in the history of the elevated system, according to the company's annual report.

A total of 228,812,766 passengers was carried, an increase of 12,767,191 over the previous year. In the month of December 20,980,331 riders were handled, the greatest number ever carried in a single month. Passenger revenues, because of the large increase in the number of customers transported, rose to $18,891,998, an increase of $1,105,523. The average rate of fare received was 8¼ cents. Gross revenues, inclusive of both the amount received from fares and from non-operating revenues, were $20,420,659, an increase of $1,138,771. Net income for the year was $1,117,632, an increase of $74,231. Dividends paid on the company's prior preferred stock totaled $375,740. Taxes were $1,663,456, or approximately 4½ times the amount paid to the company's stockholders.

INCOME STATEMENT OF THE CHICAGO RAPID TRANSIT COMPANY

For the year ended Dec. 31, 1926

Passenger revenue		$18,891,998
Other transportation revenue		1,259,156
Gross operating revenue		$20,151,154
Operating expenses:		
Maintenance of way and structure	$1,922,496	
Maintenance of car equipment	1,545,600	
Power	2,119,020	
Conducting transportation	7,228,708	
General and miscellaneous	1,318,373	
Total operating expenses (*a*)		$14,134,199
Net operating revenue		$6,016,955
Taxes, city compensation		1,663,456
Operating income		$4,353,499
Non-operating income		269,504
Gross income		$4,623,003
Deductions:		
Rentals	$1,039,525	
Interest on mortgage debt and equipment obligations	2,367,825	
Other interest (*b*)	32,260	
Amortization of discount	65,760	
Total		$3,505,371
Net income for year 1926		$1,117,632
SURPLUS ACCOUNT		
Balance, surplus Dec. 31, 1925		$1,731,713
Net income for the year ended Dec. 31, 1926 (as above)	$1,117,632	
Less dividends paid on prior preferred stock	375,740	
Surplus earnings for the year unappropriated		$741,891
		$2,473,604
Miscellaneous debits and credits (Net)		40,813
Surplus, Dec. 31, 1926		$2,514,418

(*a*) Total operating expenses include $316,086 credited to retirement reserve.

(*b*) No interest declared or paid on adjustment debenture bonds.

The company operated a total of 57,486,898 car-miles during the year, compared with 54,525,633 car-miles in 1925.

The report says the substantial increase in business was made possible through the intensive use of the company's property. Station platforms were increased in length and eight-car trains were placed in operation on most of the lines during the rush-hour periods.

The amount expended for extensions and improvements in 1926 was $1,574,979. In addition a large amount of maintenance and renewal of structures and equipment was done at an expense of $3,219,381. Important improvement work included extension of Rapid Transit Lines service to the western suburbs of Maywood, Bellwood and Westchester, this being accomplished through a trackage lease with the Chicago, Aurora & Elgin Railroad, whereby use is made of the latter's tracks; practical completion of extension of station platforms, so as to permit of eight-car train operation; the starting of construction work on the new $250,000 Wells Street Terminal Building, which will be of great convenience to west side residents, and the letting of a contract for the first unit of new shops to be located at Niles Center.

TRAFFIC AND REVENUE FROM FARES ON THE LINES OF THE CHICAGO RAPID TRANSIT COMPANY

	1924	1925	1926
Customers carried	212,901,024	216,045,575	228,812,766
Per cent increase	•	1.48	5.91
Revenue from fares	$17,656,082	$17,786,474	$18,891,998
Per cent increase		74	6.22

INCOME ACCOUNT COMPARED

	1924	1925	1926
Gross earnings*	$18,775,933	$19,281,888	$20,420,660
Maintenance, renewals	3,537,147	3,222,965	3,468,097
Conducting transportation, power, miscellaneous	10,222,503	10,122,229	10,666,102
Taxes	1,407,460	1,622,315	1,663,457
Total expenses	15,167,110	14,967,509	15,797,656
Net earnings	3,608,823	4,314,379	4,623,004
Fixed charges	2,807,448	3,270,978	3,505,372
Net income	$801,375	$1,043,401	$1,117,632

*Includes revenue from fares and rentals from company properties.

During the year the company was given the first award in a national public relations contest conducted under the sponsorship of the American Electric Railway Association for having done most during the year to win the good will of its customers.

There were 6,061 persons in the employ of the company at the end of the year. Continuing its policy of providing group insurance for its employees, the company extended the scope of this method of protection to provide sick benefits of $20 a week and also obligated itself to pay the full cost of the premiums for $1,000 death benefit for each employee, with double indemnity in case of accidental death.

Besides indicating the company's progress during 1926 in its educational activities and accident prevention work the report is a chronology of the rapid transit lines.

The financial reorganization of all the elevated railroads of Chicago was perfected in January, 1924. At that time they were combined in one company under the present name, the Chicago Rapid Transit Company. The progress made since then is illustrated by the accompanying comparison of figures for the three years.

Surplus for Washington-Baltimore Interurban

For the year ended Dec. 31, 1926, the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., realized a net income of $24,106, but on account of profit and loss net credits the company finished the year with a surplus of $32,071, against $245,242 in 1925. These facts were contained in the annual report to the stockholders. The decline in the number of revenue passengers carried is noted as follows:

1926	3,871,600
1925	4,021,766
1924	4,429,387
1923	4,644,472
1922	4,570,996
1921	4,692,860

One per cent of the gross operating revenue was credited to "Reserve for Injuries and Damages." The balance in reserve account on Dec. 31, 1926, was $115,333. The disbursements in payment of accident claims, suits, judgments and other expenses of the department amounted to 1.48 per cent of the gross operating revenues.

Car-miles operated totaled 4,479,856; of this total 4,209,483 were passenger-miles, 259,888 freight and 10,485 service-miles.

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY FOR THE YEAR ENDED DEC. 31

		1926		1925
Operating revenue		$2,564,047		$2,694,910
Operating expenses prior to provision for depreciation		1,826,038		1,994,723
Net operating revenue prior to provision for depreciation		$738,009		$700,187
Taxes assignable to railway and other operations		121,713		128,867
Operating income prior to provision for depreciation		$616,295		$571,319
Non-operating income (net)		29,853		27,516
Gross income for the year applicable to interest on funded debt		$646,149		$598,836
Deductions from gross income.				
Interest on funded debt	$522,513		$518,804	
Amortization of discount on funded debt	53,994		47,077	
Provision for depreciation	45,535		46,488	
		622,042		612,370
Net income for the year		$24,106		*$13,533
Profit and loss net credits during the year		7,964		258,776
Profit and loss gross surplus for the year		$32,071		$245,242
Dividends paid		None		None
Profit and loss surplus for the year		$32,071		$245,242
Profit and loss surplus at beginning of the year		773,080		527,837
Profit and loss surplus at close of the year		$805,151		$773,080

* Deficit.

EARNINGS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

	1926	1925	1924	1923	1922	1921
Per car-mile (cents)	49.65	53.00	52.00	54.30	56.13	53.60
Per miles of track operated	$15,237	$16,627	$17,763	$18,152	$18,248	$18,841
Per mile of road	$27,702	$30,185	$32,212	$32,916	$33,092	$34,173
Per passenger (cents)	45.00	47.71	46.76	45.58	46.98	45.97

$55,563,737 for New York Subways

Contracts for This Sum Let in 1926 by Transportation Board—$76,498,606 in Awards Authorized in Two Years

Contracts for subway construction amounting to $55,563,737 were awarded by the Board of Transportation of New York City in 1926. During the 2½ years of its existence the board has awarded a total of $150,324,118 in subway construction contracts, of which $10,100,690 was awarded in the last six months of 1924 and $84,659,691 in 1925. The route mileage of the construction contracts awarded in 1926 is 5.82, of which 4.32 miles is for the new city system and 1.5 miles for the Brooklyn-Manhattan Transit system. The total route mileage of contracts awarded in the 2½ years is 16.12; 12.52 miles for the city system and 3.6 miles for the B.-M.T.

The awards made in 1926 are divided as follows:

City's new subway system	$47,736,576
Interborough system	1,526,604
B.-M.T. system	5,956,724
Miscellaneous	343,833
Total	$55,563,737

Payments for the new city-owned rapid transit facilities during 1926 amounted to $52,095,502.90, divided as follows:

For city's new system	$41,847,613
For Contract 1 (I. R. T.)	96,714
For Contract 3 (I. R. T.)	9,099,931
For Contract 4 (B.-M. T.)	7,952,754
For alterations	101,307

The total rapid transit disbursements approved by the board from July, 1924, to Dec. 31, 1926, amounted to $76,498,606.26, divided as follows:

For city's new system	$49,032,133
For Contract 1 (I. R. T.)	182,312
For Contract 2 (I. R. T.)	668
For Contract 3 (I. R. T.)	9,099,431
For Contract 4 (B.-M. T.)	17,886,668
For alterations	296,891

The $47,736,576 in awards for the construction of the city's new subway system last year embraced eight major contracts amounting to $47,671,644. For borings, removal of buildings, reinterment of bodies in Nagle Cemetery on the Harlem River yard site contracts were awarded aggregating $64,932.

There are now under contract for the city's new subway system twenty-five sections of the Washington Heights-Central Park West-Eighth Avenue-Sixth Avenue-Church Street line, extending from the vicinity of Fulton Street to the northerly end of Manhattan Island.

Contracts for the East River tunnel from Fulton Street, Manhattan, to Cranberry Street, Brooklyn, are nearly ready for advertising. As soon as the injunction action instituted by Jasper A. Campbell, president of the Central Park West and Columbus Avenue Association, is decided by the Court of Appeals, the board will take action toward awarding the contracts for the 53d Street tunnel under Welfare Island to Long Island City, where the Brooklyn and Queens lines will join.

Another major contract awarded by the Board of Transportation last year was $1,063,115 for the Coney Island yard and shops of the B.-M.T. system.

Of this amount, $266,900 was for the West End line connection to the yard, $69,247 for the Culver line connection, $271,292 for grading the yard site, $125,000 for fill, $103,019 for tracks for the Sea Beach and West End line connections and $52,759 for steel for the main repair shop.

The board also awarded in the year four contracts aggregating $743,498 for lengthening the platforms of forty stations on the B.-M.T. system in Brooklyn and Manhattan. These platforms, when lengthened, will be 539 ft. long, and will accommodate eight-car trains, increasing the passenger-carrying capacity of each train 33⅓ per cent and standardizing the length of all trains in service on the B.-M.T. subway system.

Other awards were $570,974 for additions to the Lenox Avenue yard of the Interborough system, $181,806 for the completion of the Corona-Flushing line, which will be ready for operation to Main Street, Flushing, this summer, and $178,712 for tracks and for finishing the Times Square station of the Queensboro subway at 41st Street.

The board awarded a total of $4,128,471 for the completion of the Fourteenth Street-Eastern subway and its connection with the Broadway elevated line in East New York.

Under contract No. 3 with the Interborough Company, the board awarded a $218,919 contract for the construction of a transfer connection between the subway and elevated lines at 149th Street and Third Avenue, the Bronx, and one of $116,723 for an additional passageway at Canal and Varick Streets to connect with the approach to the New York and New Jersey vehicular tunnel.

In the year just ended, the board acquired by private purchase or by condemnation ownership of 176 parcels of real estate in Manhattan, Brooklyn and the Bronx with a total area of about 43 acres. Permanent easements were acquired under 38 other parcels and temporary easements were acquired at many points to provide access to the work of subway construction. The total value of the rights in real property acquired is estimated at about $10,500,000, a closer approximation being impossible because the courts in many instances have not yet fixed the awards in condemnation proceedings.

Properties at Morgantown Sold

Signing of a contract by the Monongahela West Penn Public Service Company for the purchase of the physical property of the West Virginia Utilities Company, Morgantown, W. Va., was announced at Fairmont by Capt. George M. Alexander, president of the company. Immediately after the announcement Captain Alexander left the city and his bare statement of the facts could not be amplified by other officials of the concern. No reference to the purchase price was made, but estimates by persons familiar with the property place the sale price at $4,000,000.

The announcement by the head of the Monongahela West Penn Company follows:

> According to an announcement by Capt. G. M. Alexander, president, the Monongahela West Penn Public Service Company through one of its subsidiaries has signed a contract for the purchase of all the physical property of the West Virginia Utilities Company, located in and around Morgantown. These properties include the water, natural gas, railway and electric light and power systems now a part of the West Virginia Utilities Company.
>
> Morgantown and the growing communities tributary to it have a population of more than 40,000 and for the last five years have shown a most substantial and consistent growth. It is the seat of the state university, with an attendance of some 3,000 students; it is also the center of the most recent extensive soft coal developments in the state of West Virginia.
>
> Captain Alexander stated that the Monongahela West Penn Public Service Company would probably take over the operation of the Morgantown properties some time in July.

The statement by President Alexander indicates that the property is being purchased by a subsidiary of the Monongahela West Penn, but it is not known whether it will be operated under that name.

Net Income of Chicago Railways Improves

Net earnings of the Chicago Railways, Chicago, Ill., in the year ended Jan. 31, 1927, were $1,292,673. This is the sum available for interest on the adjustment income bonds, against $1,061,548 in the preceding year. The surplus for the year after all interest and other charges was $1,092,674, against $961,548 in the preceding year. These facts are included in the nineteenth annual report of the company.

The Chicago Railways, which owns the north and west side street car lines and is the largest operating unit of the Chicago Surface Lines group, went into receivership shortly after the expiration of the franchise at the end of January. This statement will have, therefore, an unusual amount of interest. Of particular interest in the balance sheet will be a comparison of property values and bonded debt. The city purchase price of the properties came to $94,438,640, against a total debt of $103,854,255. The road, equipment and franchise are carried in the

INCOME STATEMENT OF THE CHICAGO RAILWAYS FOR YEAR ENDED JAN. 31, 1927

	1927	1926
Company's share (60 per cent) of residue receipts of Chicago Surface Lines..	$7,981,267	$7,294,604
Deduct: Joint account expenses..............	298,934	70,646
	$7,682,332	$7,223,957
Deduct: Interest at 5 per cent on capital valuation	4,713,629	4,707,592
Income divisible with city of Chicago...............	$2,968,702	$2,516,365
City's 55 per cent of divisible income................	$1,632,786	$1,384,001
Company's Income:		
45 per cent of divisible income................	$1,335,916	$1,132,364
5 per cent interest allowed on capital valuation of property..............	4,713,629	4,707,592
Interest on bank balances..	162,513	124,549
Interest on treasury securities..................	73,778	73,786
Miscellaneous income.....	100	4
Total income........	$6,285,937	$6,038,297
Deductions:		
Interest accrued on—		
First mortgage bonds....	$2,784,700	$2,784,700
Consolidated mortgage bonds...............	1,693,329	1,693,329
Purchase money bonds..	203,650	203,649
Interest on loans..........	43,261	46,846
Federal income tax on interest coupons........	65,016	66,000
Corporate expenses and interest adjustments with Chicago Surface Lines...	203,304	182,222
Total deductions.....	$4,993,262	$4,976,749
Net income..........	$1,292,674	$1,061,548

Conspectus of Indexes for June, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	June 1927 **7.44**	May 1927 **7.44**	June 1926 **7.37**	Feb. 1927 **7.45**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	June 1927 **143.0**	May 1927 **144.2**	June 1926 **154.4**	Sept. 1920 **247.5**	June 1927 **143.0**
Electric Railway Wages* 1913 = 100	June 1927 **227.5**	May 1927 **227.4**	June 1926 **225.5**	Sept. 1920 **232**	Mar. 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	June 1927 **200.6**	May 1927 **201.0**	June 1926 **201.9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	June 1927 **205.6**	May 1927 **206.8**	June 1926 **204.8**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	May 1927 **144.1**	April 1927 **144.2**	May 1926 **151.7**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	June 1 1927 **12.43**	May. 1 1927 **12.44**	June 1 1926 **12.76**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	May 1927 **155.4**	Apr. 1927 **153.6**	May 1926 **161.1**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	May 1927 **163.7**	Apr. 1927 **163.7**	May 1926 **167.8**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	May.31 1927 **3.051**	Apr.30 1927 **3.456**	May 31 1926 **3.649**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	May 1927 **18.62**	Apr. 1927 **18.55**	May 1926 **18.32**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	May 1927 **1636** **39.71**	Apr. 1927 **1671** **55.36**	May 1926 **1635** **60.84**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

SURPLUS ACCOUNT OF THE CHICAGO RAILWAYS JAN. 31, 1927

Surplus, Jan. 31, 1926		$4,337,018
Add: Net income for the year		1,292,674
		$5,629,692
Deduct: interest on adjustment income bonds		
For year ended Jan. 31, 1926 (paid May 1, 1926)	$100,000	
For year ended Jan. 31, 1927 (payable Feb. 1, 1927)	100,000	200,000
Surplus Jan. 31, 1927		$5,429,692

balance sheet at the sum of $101,035,875.

The report states that the Chicago Railways during its twenty years of operation under the ordinance of 1907 and subsequent ordinances paid to the city of Chicago $24,589,605, as 55 per cent of the divisible net earnings. President Henry A. Blair said that there was expended during last year, as in the past, more than the ordinance requirements on maintenance and repairs, with the result that the physical property was in excellent condition.

Net Earnings of Illinois Power & Light Up 11 Per Cent

Gross earnings from operations of the Illinois Power & Light Corporation, Chicago, in 1926 were $31,189,628, an increase of more than 7 per cent over last year. The net earnings were $11,808,639, 11 per cent greater than in 1925. Dividends on all of the stocks outstanding were earned on a substantial basis, and a protective margin remained after the full payment of dividends. The balance sheet shows a very satisfactory financial and credit position at the end of the period.

Intensive efforts have been continued to increase the freight, express and through passenger business of the trunk line electric railroad of the Illinois Traction System connecting Danville, Champaign, Decatur, Bloomington, Peoria, Lincoln and Springfield with Edwardsville, Granite City, Madison and St. Louis. This property was originally designed as a passenger carrying line, but great strides have been made during the last four years in the development of other business, not only interchanges of freight with practically all of the steam railroads. During 1926 more than 3,000 tons of 90-lb. rail was laid on the main division, 40,000 tons of gravel ballast was placed and more than 60,000 creosoted ties were installed.

New large type electric locomotives and new cars were put in service, all of which were constructed at the Decatur shops. A considerable amount of overhead trolley was renewed, additional feeder lines installed, the capacity of three railroad substations was doubled on the main line, and crossing signal light installations increased. The capacity of the freight house at Peoria was materially increased and new or extended sidings installed along the line to accommodate larger freight business. On the Illinois Valley division additional capacity for railroad service was installed at the LaSalle power house and improvement made in the method of furnishing energy for the operation of the road.

Portions of the Illinois Central and the Wabash Railroad tracks around Champaign and Urbana were electrified and operating rights secured thereover, thus providing a freight belt around these cities. Construction of a new freight house was started at Champaign, to be finished some time in 1927.

On the St. Louis, Troy & Eastern Railroad, operated by steam, additional large locomotives and all-steel hopper bottom coal cars were placed in service to handle additional business.

Improvements and changes have been continued in the city railway lines to effect economies of operation. The use of buses has been increased to replace certain unprofitable railway lines and to furnish service where the growth of the community has extended beyond existing car tracks. A number of garages were completed or enlarged during 1926 in order to handle the buses efficiently.

CONSOLIDATED STATEMENT OF INCOME AND EXPENDITURES OF ILLINOIS POWER & LIGHT CORPORATION

(Year Ended Dec. 31, 1926)

Gross earnings from operation:		
Electric light and power	$16,467,204	
Electric and steam railroads	5,971,273	
City railway and bus lines	4,198,798	
Gas	3,336,916	
Heat	712,847	
Bridge	618,037	
Ice	261,304	
Water	110,476	
Miscellaneous	213	
Combined gross earnings	$31,677,074	
Less intercompany items	487,445	
Gross earnings from operation		$31,189,628
Expenses and taxes:		
Operating expenses (less intercompany $487,445.07)	$14,334,148	
Maintenance	3,772,226	
Taxes, local and federal	1,274,614	
Total expenses, maintenance and taxes		19,380,989
(Labor, fuel and other costs of producing and distributing utility service. Expenditures for repairs to keep the property in good operating condition. Estimated federal, state and local taxes.)		
Net earnings from operation		$11,808,639
(Balance remaining to pay interest on bonds and other current borrowings, dividends and to provide for depreciation.)		
Less fixed charges:		
Interest charges, etc	$5,850,033	
Bond discount amortized	262,641	6,112,675
Surplus available for dividends and depreciation		$5,695,964
Dividend on Preferred Stocks:		
Illinois Power & Light Corporation and subsidiary companies		2,590,883
		$3,105,081
Appropriated for depreciation, retirements, replacements, etc		1,721,892
(Amount appropriated from current earnings to provide for retiring, renewing or replacing physical property.)		
Balance		$1,383,189
Surplus Jan. 1, 1926		1,508,040
		$2,891,229
Dividends paid on common stock, 1926		900,000
Surplus per balance sheet		$1,991,229
(Surplus earnings reinvested in physical property or reflected in current assets, etc.)		

Toledo Losing Money—Little Variation in Passenger Traffic

Suggestion that the Community Traction Company, Toledo, Ohio, is losing money, patronage and good will by the dilatory methods of working out some agreeable solution to its transit problems, which will secure extensions of service, put streets in good conditions, secure better service at more reasonable fare and also enable the company to improve its equipment, is contained in the annual report made by acting Street Railway Commissioner E. L. Graumlich to the City Council.

INCOME STATEMENT OF THE COMMUNITY TRACTION COMPANY, FOR YEAR ENDED DEC. 31

	1926	1925
Passenger revenue	$3,404,105	$3,483,896
Special car revenues, express revenue, non-operating revenue, etc	156,417	149,039
Total revenue from all sources	$3,560,522	$3,632,935
Total operating expenses including taxes	$2,866,178	$2,794,724
Net income from operation	$694,344	$838,210
Depreciation	137,906	138,091
Sinking fund—City's purchase fund	299,899	284,149
Interest on floating debt	12,831	10,238
Total deductions from income	$450,637	$432,479
Balance is amount available for the stabilizing fund	$243,706	$405,731
Interest on bonds	409,955	426,260
Dividends preferred stock	87,704	86,562
Total interest and dividends	$497,659	$512,822
Net deficit	$253,952	$107,090

Total revenue of the company for 1926 was $3,560,522, compared with a gross revenue of $3,632,935 for the previous year. There was less than 1 per cent loss in passenger revenue, but a decrease in the income from rentals received from interurban lines for use of city tracks made up a large part of the difference in revenues. However, operating costs, taxes and other expenses increased, which for the year's operation produced a loss of $253,952, compared with $107,090 in 1925, after the required set-up for various reserves and charge was made for interest on bonds and dividends on preferred stock.

In explaining how the company can continue to operate on such a losing basis Commissioner Graumlich says the sinking fund credits should be taken into consideration as offsetting in a measure the deficit accumulated in the

STATEMENT OF PASSENGERS CARRIED BY COMMUNITY TRACTION COMPANY, TOLEDO

	Cash Fares	Token Fares	Children	Transfers	Total Revenue Passengers	Employees	Total Passengers
Total—1926......	7,199,994	30,955,606	1,650,087	8,510,260	48,315,947	1,695,707	50,011,654
Total—1925......	7,052,954	31,477,335	1,330,664	8,516,534	48,377,487	1,738,278	50,115,765

	Revenue-Miles Operated		
	Cars	Coaches	Total
Total—1926....................................	6,667,419	338,769	7,006,188
Total—1925....................................	6,727,174	....	6,727,174

	Car-Miles Operated	
	Community Traction Company Cars	Interurban Cars
Total—1926..................................	6,675,677	513,174
Total—1925..................................	6,737,633	521,499

stabilizing fund. Total loss as reflected in the stabilizing fund was $910,544 at the close of 1926. This covers the entire six years of service-at-cost operation under the Milner ordinance. However, during this period the sinking fund accounted for retirement of $1,406,000 of the bonds with some additional cash balance in the fund.

INCOME AND EXPENSE OF COACH OPERATION OF COMMUNITY TRACTION COMPANY, TOLEDO, JULY 1 TO DEC. 31, 1926

		Per Coach-Mile, Cents
Revenue		
Passenger....................	$71,738	21.176
Special coach—contract.........	8,018	......
Special coach—misc'l...........	2,367	3.066
Total revenue..................	82,123	24.242
Expense		
Maintenance..................	$7,996	2.360
Gas and oil....................	12,108	3.575
Garage expense................	7,511	2.217
Transportation................	31,331	9.248
Traffic........................	492	0.145
General and miscellaneous......	6,943	2.050
Rent of coaches................	23,378	6.901
Total operating expense........	$89,759	26.496
Net operating revenue............	$7,635	2.254
Taxes..........................	3,952	1.167
Deficit..........................	$11,587	3.421
Adjustment of expense No part of the general expense of the company has been charged against coach operation. Amount which we believe should be prorated to coaches is estimated at (based on revenue miles).................	11,590	3.421
Deficit is adjusted...............	$23,177	6.842
Ratio expense (as adjusted) and taxes to total revenue, per cent.........		128.223

Commissioner Graumlich said in his report:

> The result of the operation under the ordinance, however, is not equally satisfactory to the car riders nor to the citizens of the city generally. The loss in revenue due to competitive bus service and the high operating costs resulting from duplicated car service and excessive power charges, together with the heavy requirements for the sinking fund, have not left sufficient money available for the required maintenance and renewal of the company's property even at a maximum rate of fare and with curtailed service.
>
> This is not only reflected in the inability of the company to render satisfactory service but it also seriously interferes with the city's public improvement program, since new track construction cannot be financed and consequently new pavements on important thoroughfares are being held up or can only be partially completed.
>
> The operation of the company has not only been handicapped, as stated, but during the past year franchise negotiations which have been continuously under way have seriously interfered with the management of the system.

Commissioner Graumlich points out that under such unsettled conditions it has been impossible to take advantage of the aggressive policies being developed by street railways in other cities for winning business. It is estimated that independent buses cause a loss of about $250,000 in revenue annually to the street railway property. Through special investigation and a more careful inspection system, pull-ins were reduced 40 per cent. The company spent $82,501 in paving between tracks and laid the equivalent of a street 36 ft. wide and 3 miles long in new and relaid brick paving.

Net Income in London, Ont., Increases

The gross earnings of the London Street Railway, London, Ont., for the year ended Dec. 31, 1926, was $626,690, a decrease of $2,202 compared with 1925. Operating expenses were $528,528, a decrease of $482 as compared with 1925. The expense of allocation was as follows: Maintenance and structure, $70,335; equipment, $54,180; power, $45,022; operation of car, $258,564; operation of buses, $44,750, and miscellaneous, $55,676. The net income after deductions for fixed charges, depreciation and Dominion income tax, amounted to $14,958, showing an increase over 1925 of $107. These facts were disclosed in the 52d annual report, submitted at the annual meeting held in February.

Continuing the policy of making improvements to the property, the company reconstructed approximately 75 per cent. of the double trackage and new special work was accomplished. Improvements covering road and equipment for the year amounted to $27,291. In addition to these improvements, the company purchased during the year, six Yellow Cab buses at a total cost of $46,160. The total improvement for the year amounted to $73,451.

The report refers to the 5-cent fare agreement renewed during the year and to the negotiations carried on with the City Council for an extension of the franchise and the purchase of the railway, both of which propositions were defeated at the municipal elections held on Dec. 6, 1926.

Included in the annual report are a seven years comparative statement of revenue and expenses under old fares (except temporary increase — five months in 1919) and a five-year comparative statement of revenues and expenses under 5-cent fare, June 14, 1922, to Dec. 31, 1926. The latter statement is reproduced in this digest.

May Abandon One Line.—Abandonment of the Detroit, Lake Shore & Mount Clemens line of the Detroit United Railway, Detroit, Mich., operating between Detroit and Mount Clemens, is possible in the near future. In this connection St. Clair Shores village gave notice more than a month ago that the franchise in that village granted in 1897 and expiring June 21 would not be renewed. The line's franchise in Grosse Point Village and Grosse Point Farms has seven years more to run. The line, unprofitable for a number of years, was built as a rival to the Rapid Railway system operating between Detroit and Mount Clemens and which also was absorbed by the Detroit United Railway.

FIVE YEARS COMPARATIVE STATEMENT OF REVENUES AND EXPENSES OF THE LONDON STREET RAILWAY

Under 5-Cent Fare—June 14, 1922, to Dec. 31, 1926

	1922	1923	1924	1925	1926
Earnings from passengers..........................	$586,442	$685,608	$657,572	$621,079	$618,877
Other sources....................................	8,141	7,803	7,729	7,838	7,813
Gross earnings....................................	$594,583	$693,411	$665,302	$628,917	$626,690
Operating expenses................................	494,986	572,082	546,364	529,010	528,528
Net earnings......................................	$99,597	$121,329	$118,938	$99,907	$98,162
Deduct interest on bonds, interest on loans and taxes	34,620	37,086	43,200	45,418	43,792
Net income before providing for depreciation........	$64,977	$84,242	$75,737	$54,489	$54,369
Depreciation of road and equipment..............	35,423	37,364	38,091	38,125	38,125
Net income..	$29,553	$46,877	$37,645	$16,364	$16,244
Deduct dominion income tax.......................	2,896	4,720	3,748	1,513	1,286
Balance, net income...............................	$26,657	$42,157	$33,897	$14,850	$14,958
Dividends paid....................................	*15,937	†31,874	None	None	None
Balance to surplus................................	$10,720	$10,283	$33,897	$14,850	$14,958
Return on capital, per cent........................	4.18	6.61	5.32	2.33	2.34

*2½ per cent. †5 per cent.

STATISTICAL STATEMENT OF THE LONDON STREET RAILWAY

	1922	1923	1924	1925	1926
Passengers carried.....................	13,413,945	13,865,148	13,299,634	12,552,064	12,514,582
Transfer passengers....................	1,536,969	1,782,195	1,749,234	1,644,584	1,780,643
Total passengers.......................	14,950,914	15,647,343	15,048,868	14,196,648	14,295,225
Car earnings per revenue passenger, cents.	4.37	4.94	4.94	4.94	4.94
Car-miles operated.....................	1,853,622	2,124,160	2,087,746	2,040,484	2,160,678
Revenue, cents per car-mile.............	32.08	32.64	31.87	30.82	29.00
Total expenses in cents per car-mile......	30.63	30.65	30.25	30.09	28.31
Net income per car-mile in cents.........	1.45	1.99	1.62	0.73	0.69

Personal Items

H. B. Cobban Heads Midwest Association

Operating Head of Oklahoma Road Elected at Recent Meeting of Railway Men in St. Louis

H. B. Cobban, Miami, Okla., secretary-treasurer and general manager of the Northeast Oklahoma Railroad, was elected president of the Midwest Electric Railway Association at the meeting held in the Hotel Chase, St. Louis, Mo., June 9, 10 and 11. The association is composed of officials and employees of electric railways in six states, Missouri, Kansas, Oklahoma, Arkansas, Nebraska and Colorado. Incidentally it might be said that Oklahoma is in line for the June meeting in 1928, as an invitation has been extended to the association to meet in Miami, the home of the new president-elect.

H. B. Cobban

Mr. Cobban has been secretary-treasurer and general manager of the Northeast Oklahoma Railroad since Dec. 1, 1919. This represented his entrance into the railway field, for before that he had been engaged in manufacturing and in jobbing. He was born in Wakeman, Ohio, on Aug. 3, 1877, and attended the grade schools in Springfield, Mo. He is a man of many interests, linked not only with the agricultural Middle West but with its mining activities and its banking and general business. He is president of the Miami Building and Loan Association, a director of the Miami Chamber of Commerce, a director of the Oklahoma Utilities Association, chairman of the industrial committee of the Miami Chamber of Commerce and president of the Miami Rotary Club. In the past he has been vice-president of the Oklahoma Utilities Association, secretary of the Miami Chamber of Commerce, president of the Miami Chamber of Commerce, a member of the Oklahoma Council of Defense, vice-chairman of all Liberty Loan drives, secretary of the Miami Building and Loan Association, vice-president of the Ottawa County Chapter of the American Red Cross, and chairman of the United States Boys Working Reserve.

Henry S. Day Goes to Providence

Henry S. Day has been appointed superintendent of equipment of the United Electric Railways, Providence, R. I. He assumed his new duties on June 16. Mr. Day has had 25 years experience in contact with direct maintenance of electric railway equipment.

He started his career with the Westinghouse Electric & Manufacturing Company as a road engineer, specializing on railway equipment in the New York territory. For five years he was in charge of maintenance and inspection of electric motive power for the New Haven road. Valuation and appraisal of electric railway properties engrossed his attention for three years when he was connected with Sanderson & Porter of New York. After duty overseas in the World War, in which he served as captain of engineers, Mr. Day returned to this country and took a position with the Kansas City Railways, Kansas City, Mo., as equipment engineer in charge of the mechanical department. In this capacity he succeeded in reducing the expenses of the department to the extent of several hundred thousand dollars a year. During the past three years he has been manager of the transportation division of the Westinghouse company.

Changes in Philadelphia Personnel Approved

The resignation of W. K. Myers as president of the Philadelphia Rapid Transit Company, effective on July 1, was submitted to the board of directors at its regular monthly meeting on June 20 and accepted by that body. Mr. Myers is relinquishing active control of the Philadelphia Rapid Transit Company to assume the duties of executive vice-president of the recently organized Mitten Bank Securities Corporation. He will continue a member of the executive committee and of the board of directors of the railway.

R. T. Senter, at present vice-president of the Philadelphia Rapid Transit Company, was elected president to succeed Mr. Myers.

In his letter of resignation to T. E. Mitten, chairman of the board of directors of the Philadelphia Rapid Transit Company, Mr. Myers said:

> At the request of the board of directors of the Mitten Bank Securities Corporation, I have accepted the position of executive vice-president of that organization.
>
> As the duties of this office will require all of my attention, I will be unable to continue as president of the Philadelphia Rapid Transit Company. I therefore submit my resignation as president of this company, effective July 1, 1927.

This formal action represents the consummation of a plan to which extended reference was made in the Journal for June 11, 1927, page 1067.

J. R. Fitzpatrick Vice-President of Haskelite

James R. Fitzpatrick has been made vice-president of the Haskelite Manufacturing Corporation, Chicago, Ill. Mr. Fitzpatrick continues as secretary and member of the board of directors. He also continues in charge of sales.

Briefly, he has been with the Haskelite Manufacturing Corporation almost since the organization of the company in 1917, and has served it in all capacities from factory manager to purchasing agent and sales manager and also as an executive.

Mr. Fitzpatrick is very active in trade associations in the electric railway field. At the present time he is a member of the American Electric Railway Association special manufacturers' committee and a member of the committee on meetings and subjects. He served on the American Electric Railway Association exhibit committee in 1925. He is a member of the American Society of Civil Engineers and the Society of Automotive Engineers.

J. R. Fitzpatrick

Mr. Fitzpatrick was graduated from the Rensselaer Polytechnic Institute of Troy, New York, with the degree of civil engineer. Some time ago he was elected trustee of this institution.

J. T. Foster Purchasing Assistant to New Jersey Vice-President

Joseph T. Foster has been appointed purchasing assistant to the vice-president of the Public Service Corporation of New Jersey, Newark, parent company for the Public Service Railway and the Public Service Transportation Company, in charge of real estate and purchases. He has been in the employ of Public Service since 1914, the year in which he was graduated from Columbia University. He started in the testing laboratory of Public Service Electric Company and a year later was transferred to the engineering department of that company. In 1917 he was made an assistant engineer and in 1922 was promoted to assistant to the vice-president and general manager of Public Service Production Company. Two years later he was made assistant to the chief engineer of that company, the position he held just prior to his recent promotion.

G. H. Kelsay has resigned as electrical engineer of the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, and has accepted a position as assistant to the president in charge of the Montpelier Foundry & Machine Company, Montpelier, Ind. He was with the property at Cleveland for eight years, a greater portion of the time in charge of substations, car maintenance and maintenance of overhead lines. He engineered and supervised the installation of the 60-cycle railway substation equipment, installing automatic substations and semi-automatic stations at a substantial saving in the power distribution and substation operation on the Cleveland Southwestern Railway. Previous to his connection with the latter company he was superintendent of power in charge of power plants, substations and distribution lines for the Union Traction Company of Anderson, Indiana. This work covered a period of fourteen years.

Judge James H. Reed Dead

Jurist Was Long an Officer of the Philadelphia Company and the Pittsburgh Railways—Notable Record in Realm of Corporation's Legal and Financial Activities

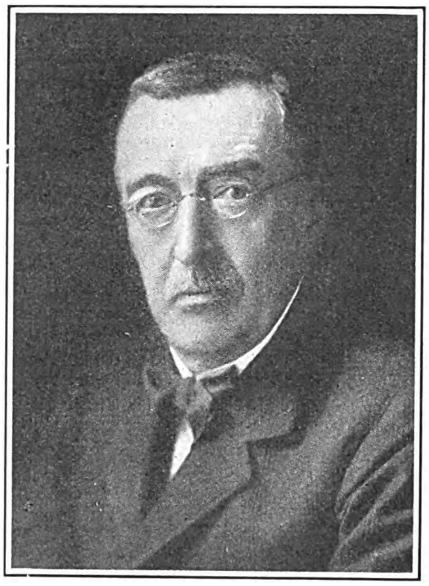
JAMES H. REED, senior vice-president and a director of the Philadelphia Company, Pittsburgh, senior vice-president and a director of the Pittsburgh Railways and an officer of many other corporations, died on June 17 after an illness of about two weeks. Judge Reed, although nearly 74 years of age, had never retired. He was at his offices daily attending to his manifold duties until two weeks before his death, which was due to a complication of ailments. At times in the course of his illness Judge Reed rallied and hopes were entertained for his recovery, but on June 15 it became apparent that the end was drawing near.

For nearly half a century Judge Reed had been one of the leading attorneys of the country. He was a leader in finance and industry, who, while active in law practice all his life, organized and aided in directing many of the greatest corporations in the United States. He was deeply interested in many philanthropic and educational activities and gave unsparingly of his time and effort in their organization and administration. He was the founder and president of the Pittsburgh Skin & Cancer Foundation and a director of the Western Pennsylvania Hospital. He was treasurer and a member of the board of trustees of the Carnegie Institute, Carnegie Institute of Technology, Carnegie Library and the Carnegie Hero Fund Commission, also vice-president and director of the United States Steel Pension Fund.

Judge Reed in 1899 prepared the charter and other preliminaries to the organization of the Consolidated Gas Company of Pittsburgh, and after this and other companies had been acquired by the Philadelphia Company he became president of the consolidated interests. He retired as president in 1919, but continued his connection with these enterprises as senior vice-president and director.

When Andrew Carnegie was approached concerning the sale of his steel company and allied possessions to the United States Steel Corporation, Judge Reed was delegated to attend to the various legal and other technicalities incident to this transaction. When the sale eventually was consummated Judge Reed became a member of the directorate of this noted organization.

An idea of the variety and extent of his associations and activities may be obtained in reading the list of some of his connections: Senior member of the law firm of Reed, Smith, Shaw & McClay, president and director of Pittsburgh, Bessemer & Lake Erie Railroad, president and director of the Union Railroad, chairman of the board of Farmers Deposit National Bank, director of Farmers Deposit Savings Bank, director of Farmers Deposit Trust Company, director of Fidelity Title & Trust Company, director of Gulf Oil Corporation, vice-president and director of Philadelphia Company and its associated companies, president and director of Reliance Life Insurance Company of Pittsburgh.



J. H. Reed

Judge Reed's elementary education was obtained in the public schools of his native city and was supplemented by study in the old Western University of Pennsylvania (now the University of Pittsburgh), from which he was graduated in 1872. He began the study of law in the office of his uncle, David Reed, at that time a foremost Pittsburgh and Pennsylvania lawyer. He was admitted to the Allegheny County bar in 1875, and soon afterward the firm of Knox & Reed was formed, the senior member being Philander Chase Knox, afterward Attorney-General of the United States and Secretary of State, closing his career as United States Senator from Pennsylvania.

This firm was successful from its start, both attorneys being corporation lawyers, with many of the largest manufacturing and commercial concerns in the city as clients. Later, when Marcus W. Acheson, judge of the United States District Court for the Western District of Pennsylvania, was elevated to the Circuit bench, Mr. Reed was nominated to the District Court vacancy, which he accepted with great reluctance. Due to this disinclination for judicial work, Judge Reed resigned within a year, and the firm of Knox & Reed resumed its activities. This firm was finally dissolved when Mr. Knox became Attorney-General under President McKinley, and the firm of Reed, Smith, Shaw & Beal, now Reed, Smith, Shaw & McClay, was formed by the remaining partners.

Judge Reed was for many years general counsel and vice-president of the Pittsburgh & Lake Erie Railroad Company, one of the most important parts of the New York Central system. Later he became general counsel for the Carnegie Steel Company, having been counsel for many of the constituents of this corporation for years before their general merging. He outlined the basis for the organization of the Pittsburgh, Bessemer & Lake Erie Railroad Company and had been its president from its formation.

Judge Reed was born on the north side of Pittsburgh on Sept. 10, 1853, son of the late Dr. Joseph Allison and Eliza (Hay) Reed.

Samuel G. Boyle

Samuel G. Boyle, for 28 years secretary-treasurer of the Louisville Railway, Louisville, Ky., and the oldest active officer of the corporation, died on June 11 at his home in Louisville. Mr. Boyle went to Louisville in 1900 as secretary-treasurer of the Louisville Railway, an outgrowth of the first railway in Louisville, founded by his father, General Boyle, and known as the Portland Avenue line. At that time Louisville was a big river handler, and there was need of a line connecting Portland and Louisville. Samuel Boyle, the son, was born at Danville, Ky., in 1860. He attended Centre College at Danville, Ky., and Johns Hopkins University. Later he edited and published the *Kentucky Stock Farmer*, was editor and publisher of the Lexington *Herald* and was also an editorial writer for that paper from 1921 to 1924.

George E. Patterson, long a resident of St. Catharines, Ont., and a pioneer in street and electric railway work in Canada, died in Pasadena, Cal., on June 12. He was 88 years old. Mr. Patterson established a carriage building business in St. Catharines in 1874 and later constructed horse cars, one of which was converted into an electric car and operated between St. Catharines and Thorold in 1887. Thirty years ago he went to Philadelphia and manufactured electrical equipment until his retirement five years ago.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Treasury Department Drops German Rail Dumping Case

No evidence having been obtained to support a suspicion of dumping, the Treasury Department has ordered collectors of customs to release appraisement reports on steel rails imported from Germany and the investigation as to dumping has been dropped.

The investigation was ordered by the Treasury last March following a complaint from a domestic producer of steel rails that an importation of rails from Germany for the Boston & Maine Railroad was at a price below the market price in Germany and hence violative of the anti-dumping law. Investigation among other producers of steel rails in this country, however, coupled with inquiries in Germany, failed to substantiate the suspicion and the complaint was withdrawn by the company which filed it.

Large Switching Equipment Order Goes to Westinghouse

The Pennsylvania Railroad has just placed with the Westinghouse Electric & Manufacturing Company a large order for switching equipment for installation on the Philadelphia to Wilmington electrification project. The order includes 39 high-speed oil circuit breakers and their relays for the operation and protection of the 11,000-volt trolleys. Breakers are rated at 1,500 amp. and insulation is provided to permit a wet test of 112,000 volts. The combined maximum operating time of the breakers and their relays under short-circuit conditions is 0.04 second. This high-speed action is necessary to prevent interference with parallel telephone cables.

Included in the order also are seventeen 66,000-volt outdoor potential transformers, six type 331 oil circuit breakers, 50 type "SV" lightning arresters and choke coils and three large grounding resistors.

Centenary Celebrated by Dixon Crucible Company

By means of a handsomely finished brochure prepared by Floyd W. Parsons, author of "American Business Methods," etc., the Joseph Dixon Crucible Company, Jersey City, N. J., is celebrating its hundreth year of business life.

Mr. Parsons' story, entitled "A Tale of Yesterday, Today and Tomorrow," has a distinct literary style skillfully employed to dignify one of America's oldest business concerns. After painting the prejudices and trials which Joseph Dixon faced in creating his business, Mr. Parsons recounts the steady and consistent strides of the company from the time Dixon's attention was called in 1827 to the discovery of graphite on a New Hampshire farm.

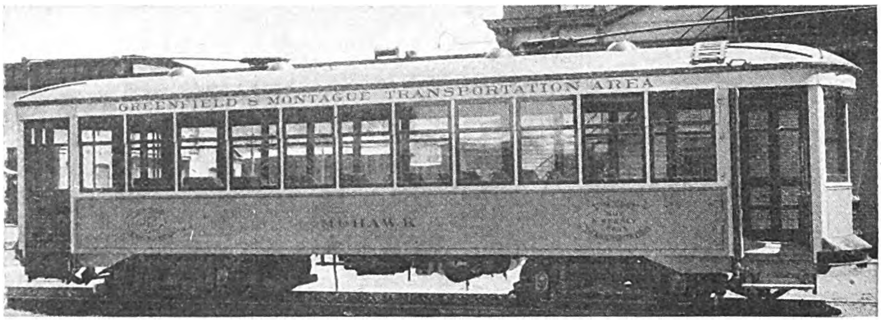
In paying tribute to the founder, this keen critic of American business methods writes: "It requires a peculiar type of mind and character to establish a business that will live and grow throughout a century. A study of American industry clearly discloses that the founders and builders of our oldest commercial institutions had certain characteristics in common. First was the urge to pioneer. Some satisfied this spirit by staying home and digging deep the foundations for an enduring trade structure. . . . The chief equipment of the scientist of yesterday was nothing more than inquisitive persevering minds. . . . Joseph Dixon was of that school, his was the restless, questioning brain!

S. H. Blake Chairman of G. E. Standardization Committee

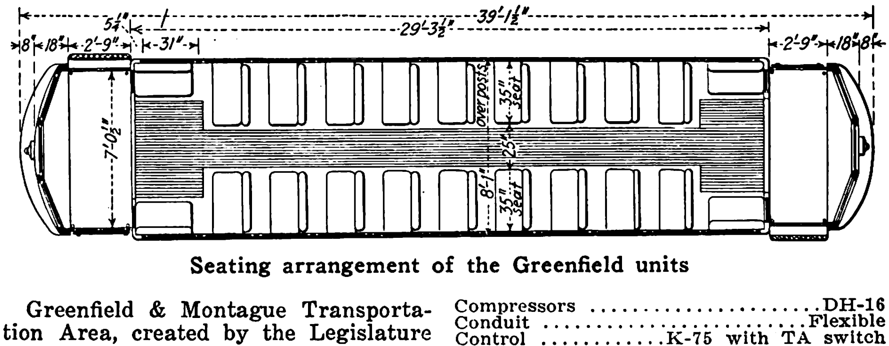
A. H. Moore, after 39 years of faithful and effective service with the General Electric Company and its associated foreign manufacturing companies, will retire on Aug. 1, 1927, on account of ill health.

S. H. Blake will succeed Mr. Moore as chairman of general and other standardizing committees and will take over his duties as of June 1, 1927.

Two New Interurban Units for Greenfield-Montague Area



Two of these trim interurban cars were added to the equipment of the Greenfield & Montague Transportation Area last month. They have a seating capacity of 32 passengers each



Seating arrangement of the Greenfield units

Greenfield & Montague Transportation Area, created by the Legislature to provide for the operation of the electric interurban line connecting Greenfield, Turners Falls and Montague, Mass., under municipal auspices, accepted delivery in May of two one-man, two-man, semi-steel interurban cars constructed by the Wason Manufacturing Company, Springfield, Mass. Specifications follow:

Date of order	Dec. 12, 1926
Date of delivery	April 30
Number of units	2
Type of unit	One-man, two-man, motor, passenger, interurban, double-end, double-truck
Number of seats	22
Length over all	39 ft.
Length over body posts	29 ft. $3\frac{1}{2}$ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. $2\frac{11}{16}$ in.
Height, rail to trolley base	10 ft. $10\frac{3}{8}$ in.
Window post spacing	31 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Brill
Car signal system	Faraday high voltage
Compressors	DH-16
Conduit	Flexible
Control	K-75 with TA switch
Couplers	$1\frac{1}{4}$-in. drawbar
Curtain fixtures	Curtain Supply Co.
Curtain material	Fabrikoid K-2 color 86
Destination signs	Hunter 128 R.R.
Doors	Folding
Floor covering	Goodrich rubber
Gears and pinions	Westinghouse helical
Glass	DTA
Hand brakes	Peacock type A-14-34
Heaters	Gold Car Heating & Lighting Co.
Headlights	Crouse-Hinds portable
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Brill $3\frac{1}{4}$ x 6 in.
Motors	Westinghouse 510-E No. 4, inside hung
Roof type	Arch
Roof material	Cotton duck
Sash fixtures	J. L. Howard
Seats	Brill 201-B
Seat spacing	31 in.
Seating material	Genuine Spanish grain leather
Steps	Folding
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	U. S. 20-A
Trucks	Brill 177-E-1
Ventilators	Brill exhaust
Wheels, type	Rolled steel diameter 27 in.
Wheelguards or fenders	Wood

Trend and Status of Adopted and Eliminated Varieties of Paving Brick

Considering the varieties adopted as recognized by the permanent committee on March 20, 1925, and again on April 1, 1926, it is noted that in 1914 these four varieties constituted 53 per cent of the total shipments of paving brick, and with minor fluctuations have shown a constant gain until in 1924 they constituted 82.1 per cent of the total shipments of the industry. Shipments in 1925 in these four recognized varieties show a falling off to 74.2 per cent of the total and to 65 per cent in 1926, due primarily to the decrease in shipments in the 4-in. depth brick. The decrease in shipments of the thicker brick, accompanied by a more marked increase in shipments of the thinner brick, stands out prominently in the trend of shipments in 1926.

The one variety (3x3½x8½-in. Dunn wire-cut lug brick) eliminated on March 20, 1925, has never amounted to a big percentage of the shipments. It was first listed in 1916. Shipments of this variety during 1926 amounted to 2.8 per cent of the total shipments.

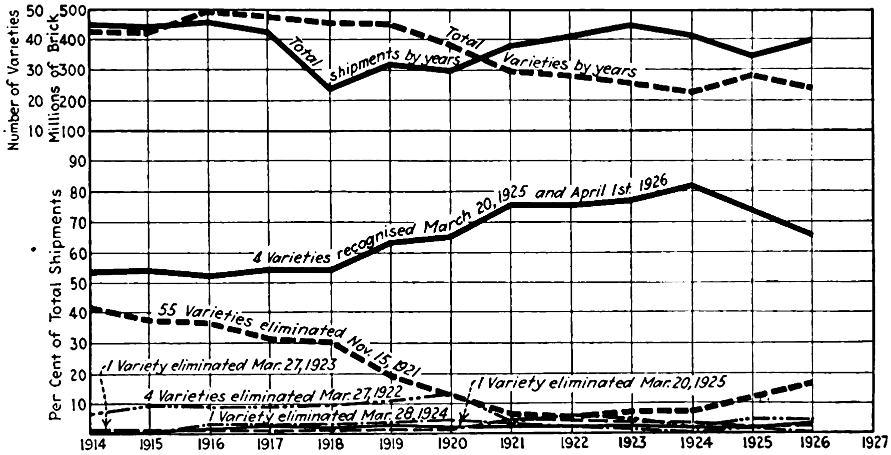


Chart of paving brick eliminated and recognized, 1914-1926

The one variety (3½x3½x8½-in. Dunn wire-cut lug brick) eliminated on March 28, 1924, has likewise never amounted to a big percentage of the shipments. It also was first listed in 1916, with 2.5 per cent. Since that year shipments have declined until in 1926 no brick of this variety were shipped.

The one variety eliminated on March 28, 1923 (4x3½x8½-in. repressed hillside brick), reached its maximum in 1921, when shipments of this variety constituted 4.8 per cent of the total for that year. It has fallen off steadily from that time, being only 2.2 per cent of the total shipments for the year 1926.

The four varieties eliminated on March 27, 1922, constituted in 1914 only 6 per cent of the total shipments of paving brick. The increase in shipments of these varieties was steady until 1920, when it reached the maximum of 15.7 per cent. Since 1921 shipments of these varieties have decreased to a total of only 4 per cent in 1926.

The 55 varieties eliminated on Nov. 15, 1921, constituted in 1914 40.9 per cent of the total shipments. The decline in shipments of these varieties was steady from 1918 to 1922 inclusive, when they constituted 5.2 per cent of the total shipments. Due primarily to the increased shipments of the 2½x4x8½-in. plain wire-cut brick, the percentage of these shipments has risen steadily since 1922, until in 1926 the total amounted to 16 per cent of those of the industry.

European Engineers Interested in Lincoln Arc Welding Prize

Mechanical engineers the engineering world over are expressing keen interest in the announcement made in New York recently by the American. Society of Mechanical Engineers that they had accepted the custody of $17,500 in prize money to be given to the writers of the three best papers disclosing new information that will tend to advance the art of arc welding.

Any one in any part of the world may compete for this prize, which is being given by the Lincoln Electric Company, Cleveland, Ohio. Entrants must submit their papers in duplicate and in accordance with the rules of the competition by Jan. 1, 1928, to Calvin W. Rice, secretary of the American Society of Mechanical Engineers, 29 West 39th Street, New York City. The first prize is $10,000, the second $5,000 and the third $2,500. Mr. Rice will furnish other details if desired.

3,634 Sq. Ft. a Day

was the A.E.R.A. Exhibit Committee's average for 29 working days. Which means that at the close of business on June 18

105,402 Sq.Ft.

had been sold to

223 Applicants

This beats last year's score for the same period by 32 applicants and 3,956 sq.ft.

IT WON'T BE TOO LATE UNTIL OCT. 3

Eight One-Man Cars Ordered by Beaver Valley Traction

The Beaver Valley Traction Company, New Brighton, Pa., announces that eight one-man, city type, double-truck cars are now being constructed in the plant of the Osgood-Bradley Car Company at Worcester, Mass., on which delivery is expected in the early fall. The order, previously announced in the JOURNAL of March 12 as embracing only six units, was placed May 10. It followed the rehabilitation of ten of twenty recently purchased cars that were found not to conform with the standard of ease and refinement set by the company for its patrons.

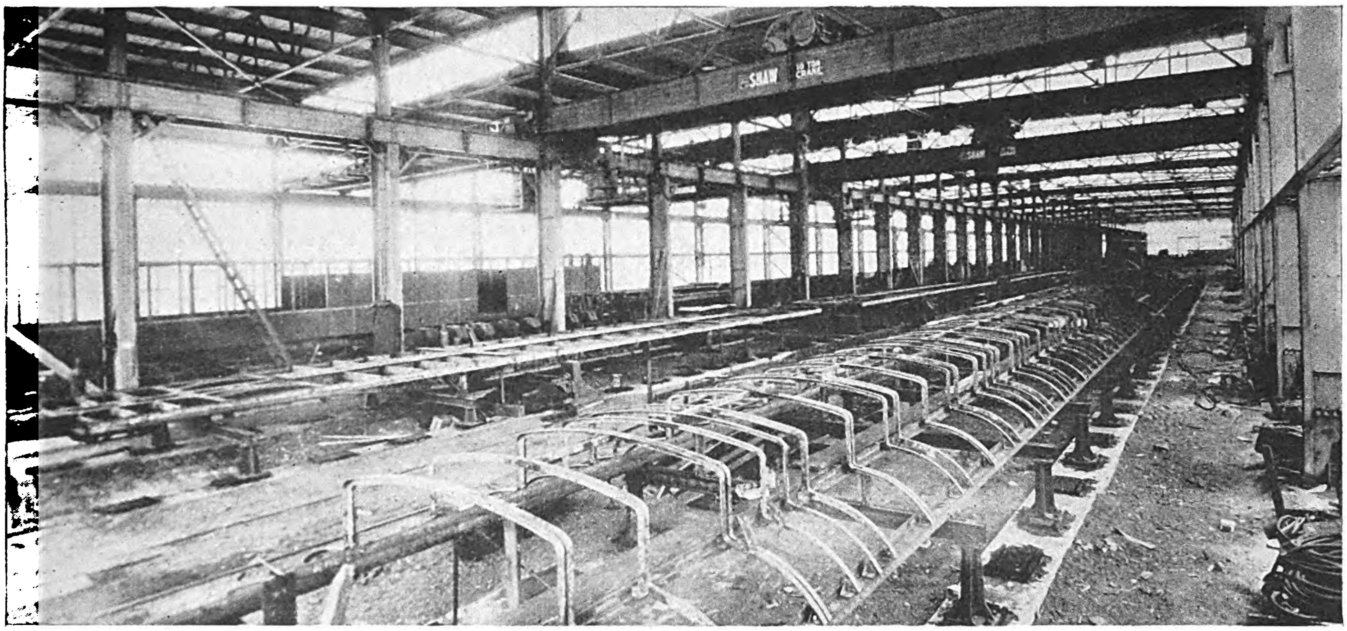
The car bodies will be semi-steel, 44 ft. over all and seating 52 passengers. Westinghouse 510-E motors have been specified. Doors will be located on the right side only.

Clinton D. Smith, general manager, has released the subjoined specifications and plans and photographs will be published in a latter issue of the JOURNAL.

Number of units	Eight
Type of unit	one-man, motor, passenger, city, double-end, double-truck
Number of seats	52
Builder of car body	Osgood-Bradley
City and state	Worcester, Mass.
Date of order	May 10
Date of delivery	Oct. 30
Weights:	
Car body	20,000 lb.
Trucks	9,600 lb.
Equipment	5,970 lb.
Total	35,570 lb.
Bolster centers	20 ft. 0 in.
Length over all	44 ft. 0 in.
Length over body posts	30 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 1½ in.
Window post spacing	28½ in.
Body	Semi-steel
Roof	Arch
Doors, right side only	End
Air brake	Westinghouse Traction Brake Co.
Armature bearings	Plain
Axles	Standard Steel Car
Car signal system	Consolidated
Compressors	Westinghouse DH-16
Conduit	Flexible
Control	K-35
Curtain fixtures	Curtain Supply Company
Curtain material	Curtain Supply Company
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Paint
Floor covering	Battleship linoleum
Gears and pinions	Helical
Glass	Crystal sheet
Hand brakes	Peacock
Heaters	Consolidated
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Standard Steel Car Co.
Lamp fixtures	30-volt lamp dome feature
Motors	Westinghouse 510-E, inside hung
Painting scheme	Body orange-sash
Roof	Arch
Roof material	Canvas
Safety car devices	Westinghouse
Sash fixtures	Edwards
Seats	Hale & Kilburn
Seat spacing	28½ in.
Seating material	Leather
Slack adjusters	Westinghouse
Steps	Folding
Step treads	Kass
Trolley catchers	Ideal
Trolley base	Nuttall No. 14
Trolley wheels	More-Jones
Trucks	Standard Steel Car Co.
Ventilators	Nichols-Lintern
Wheels	Rolled steel, diameter 28 in.
Wheelguards	H B lifeguards

More Cars for Sheffield, England

The total number of 50 new double-deck cars built under contract for the Sheffield Corporation have now been delivered. The Council's capital estimates for 1927-28 include £117,000 for



St. Louis Car Company is greatly increasing its car capacity by the opening of this modern steel erecting shop. The new structure is 1,000x135 ft. An L-shaped section at the lower end of the building will house raw materials

50 more double-deck cars, half of them to be bought under contract and the other half to be built in the corporation's shops.

$100,000 Car Modernizing Program for Virginia Company

The Virginia Electric & Power Company will spend about $100,000 in modernizing sixteen of its double-truck street cars in service at Norfolk, Va., according to latest reports. The cars will be changed from the two-man type to the one-man type. Work will be done at the Norfolk shops of the company. In many respects the rebuilt equipment will resemble the new units recently placed in service on the Naval Base line. They will have leather-upholstered seats, front and rear exits and an automatic air brake control system.

Canadian Bridge Approach to Be Improved

Anticipating heavy travel over the Falls View Bridge, the International Railway, its owner, recently announced that improvements to the Canadian bridgehead will be begun immediately after approval of plans now being prepared by Findlay & Foulis of Niagara Falls, Ont. The plans are in accordance with an outline discussed by B. J. Yungbluth, president of the railway, with prominent business men, newspaper publishers, city and park officials from both sides of the river early this year.

Work on improvements of the American end of the bridge, providing a maximum of eight inspection lanes instead of two, with greatly increased parking space and diversion of the electric railway tracks from the motor traffic lane, is now under way. Improvement of the Canadian end will involve demolition of the present buildings and construction of new buildings, harmonizing with the surroundings, and a widening of the bridge approach.

St. Louis Car Company Opens New Steel Erecting Shop

To increase its electric railway equipment capacity and to facilitate the building of steel coaches for steam railroads the St. Louis Car Company is just completing a new steel fabricating and erection shop of the most modern type. This shop is 1,000 ft. long and 135 ft. wide, built in two bays with two 10-ton traveling cranes in each bay. The shop is particularly well lighted, as the construction is of steel, erected on a low concrete foundation. The sides and roof bays are glazed with fenestra steel sash, as shown in the illustration.

Raw material, such as steel plates and shapes, are protected from the weather in a completely inclosed building, constructed for the purpose, forming an L at the lower end of the shop, and this building is also equipped with an overhead crane and runway for the expeditious handling of materials.

Shears, presses and punches are at the lower end of the shop where the material is prepared for fabrication. Four tracks built on steel jigs and concrete bases on which the cars are erected are outstanding features of the new shop. They will be perfectly aligned and surfaced for accurate construction. Facilities are such that either freight cars or passenger equipment can be efficiently produced.

When these cars are turned out at the upper end of the building they are ready for the finishing and paint shops. Additional capacity for finishing results from the new shop, as the former steel car department building No. 3 hereafter will be utilized for that purpose.

Non-Union Production Will Supply Demands for Coal

A seasonal slowing up of industrial activity is shown in the April coal consumption tonnage. The total consumption of bituminous and anthracite coal in the United States and Canada was 38,600,000 tons as of May 1. The average daily consumption amounted to 1,286,666 tons. Business in general shows a gradual seasonal curtailment; no marked recessions are in evidence.

The National Association of Purchasing Agents' coal survey gives a total of 72,288,000 tons as the amount on hand as of May 1, an average day's supply for all industries of 56 days.

The effect of the strike in union bituminous fields is clearly reflected in the production figures for April. More than 35,775,000 tons of bituminous were produced and 7,334,000 tons of anthracite, giving a total production of 43,109,000. The April bituminous figure compared with the March production of 60,147,000 at first glance might arouse some concern. However, when the present rate of consumption is taken into consideration, and the fact that industrial activity will diminish as the summer wears on, it shows clearly that the output of the non-union mines can very nearly provide for current needs.

The April production of byproduct

COMPARATIVE ESTIMATES OF U. S. PRODUCTION AND CONSUMPTION, AND STOCKS OF ANTHRACITE AND BITUMINOUS COAL IN INDUSTRIES OF THE UNITED STATES AND CANADA

	U. S. Production	Industrial Consumption	On Hand in Industries
December	66,104,000	45,085,000	49,373,000
January	63,128,000	44,671,000	55,010,000
February	58,756,000	43,536,000	57,450,000
March	64,075,000	43,237,000	65,735,000
April	43,109,000	38,600,000	77,455,000
May 1	....	....	72,288,000

coke was 3,707,000 tons, a decrease of 172,000 tons compared with the output during the preceding month. Seventy-seven active plants produced about 85 per cent of their capacity. The output of the beehive coke declined, the estimated total for the month being 780,000 tons, a decrease of 110,000 tons, or 12.4 per cent as compared with March. The output of all coke was 4,487,000 tons, of which 82.6 per cent was contributed by byproduct ovens and 17.4 per cent by beehive ovens. Production in the non-union fields has been well sustained, and if coal in storage is reasonably retained through the summer there is little reason to expect a change in the situation much before September.

The market conditions along the Atlantic Coast are dull. Considerable quantities of coal are available and some of it is being offered at a price that is not very attractive to the distributors. This is the quiet season for bituminous and, coupled with the ample stocks generally held throughout the East, practically no market stimulus exists.

On the West Coast the continued overproduction of oil has had some effect on coal consumption. Low prices on fuel oil have heightened the competitive situation.

New Home for Rockford Public Service Buses

Buses of the Rockford Public Service Company, Rockford, Ill., will be quartered in a new second-floor garage to be built by the company at its carhouse at Kishwaukee Street and First Avenue. Construction work will start as soon as bids are received and formal award made this month. The building is 200 x 98 ft. and the second floor will cover practically all this space. The enlargement will cost $50,000. A brick, fireproof structure has been specified.

Worm-Drive Axles Discussed in Timken Magazine

The May issue of *Timken Magazine*, published by the Timken Detroit Axle Company, Detroit, Mich., carries two interesting articles on the application of worm-drive axles to electric railway cars. Another article presents the Timken worm gear "driving unit." The first article explains the experimental installation made on the trucks of a car owned by the Chicago & Joliet Electric Railway, this having been treated in the JOURNAL for March 26, April 2, 16, 23 and 30 and May 7, 14 and 28. Both articles are profusely illustrated.

More Buses to Be Purchased for Cleveland

Traction Commissioner Ballou at Cleveland has announced that he will urge the City Council to approve at once the purchase of 25 new buses for the Cleveland Railway. Fifteen of the new buses would be used in rush hour service and emergencies and ten be reserved for chartering for picnics and other social outings. Mr. Ballou is quoted:

> It is imperative that these buses be purchased immediately. They are badly needed to keep the company's bus service in operation on an efficiency basis. Any argument that we should not have them because all of our bus routes are running at a loss is unsound. If we didn't have the buses we would have to lay tracks for street cars at a much higher cost.

Mr. Ballou declared that while the railway could use 50 buses he would recommend the purchase of only 25 at this time.

Metal Prices Show Little Change

The week ended June 22 has been a quiet one in the non-ferrous metal markets. Copper has sold in better volume than for two weeks, but the total business has not been large. Prices are steady. Lead has been somewhat quieter, with prices about the same as last week. Zinc has been reasonably active.

Some copper groups continue out of the market, quoting nominally 12⅜ or 12¼ cents for Eastern deliveries, but there are several sellers, and have been all week, at 12½ cents, at which price all the sales have been made so far as Connecticut buyers are concerned. Deliveries were well distributed over June, July and August, though one sale was made for as far ahead as November at 12½ cents. Wire mills have bought a little more liberally, though the wire business continues unsatisfactory, it is said.

Compared with March, the last previous 31-day month, lead production has declined nearly 11,000 tons. United States, Mexico and Spain were the largest contributors. The American Smelting & Refining Company has continued its official contract price in New York at 6.40 cents. Some small sales have been made at 6.45 cents. In St. Louis second hands sold a little lead at 6.10 cents during the early part of the market week, but sales were made at 6.125 cents and 6.15 cents each day. June 21 and 22 the prevailing price was 6.15 cents.

Prompt Straits tin has fluctuated between 67½ and 68 cents, with the price of June 22 slightly higher than that of a week ago. Spot metal is scarce both here and in London. This is reflected in the wide backwardation which amounts to about £12 in Europe. July Straits is almost 2 cents under prompt.

Practically no change has occurred in the zinc market this week. The metal has been in good demand from galvanizers and the volume of sales has been about up to the average. Most of the business has been at 6.20 cents, with scattering sales at 6.175, 6.225, and 6.25 cents. High grade is unchanged, spot carloads being offered at 8 cents, delivered in the East.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 21, 1927
Copper, electrolytic, cents per lb	12.27
Copper wire, cents per lb	15.125
Lead, cents per lb	6.40
Zinc, cents per lb	6.20
Tin, Straits, cents per lb	67.5
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.50
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N. Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.80
White lead in oil (100-lb. keg), N. Y., cents per lb	14.00
Turpentine (bbl. lots), N. Y., per gal	$0.58

Rolling Stock

Butte Electric Railway, Butte, Mont., accepted delivery in May of one six-cylinder, street car type, 29-passenger Fageol bus which was shipped from the plant of the Fageol Motors Company, Oakland, Cal.

Market Street Railway, San Francisco, Cal., in April received from the Fageol Motors Company, Oakland, Cal., one six-cylinder street car type coach.

Los Angeles Railway, Los Angeles, Cal., received from the Fageol Motors Company, Oakland, Cal., eight six-cylinder, street car type coaches during March and April.

McKinley Traction System, Peoria, Ill., has put into service four new Studebaker 21-passenger buses equipped with the special Big Six engines. The exterior of each is painted in tangerine and ivory, the molding in black and the roof in maroon. The interior is finished in mahogany and the seats are upholstered with brown Spanish leather.

Track and Roadway

Carolina Light & Power Company, Raleigh, N. C., is reported by General Manager C. S. Walters as about to begin work on the College Street loop of its electric railway line, for which a franchise was voted in May.

Janesville Traction Company, Janesville, Wis., is rebuilding its tracks on South Franklin Street between Pleasant and Galena Streets. The main part of the improvement plan is the laying of concrete along the track and the welding of joints. Plans are also under way for a new track at the Academy railroad crossing and also to rebuild the track on south Main Street.

Shops and Buildings

Municipal Railway, St. Petersburg, Fla., recently opened its new carhouse, which represents an expenditure of approximately $200,000. The structure is equipped to handle all heavy car repair work and to refinish rolling stock.

Carolina Light & Power Company, Raleigh, N. C., will erect a new $175,000 carhouse at Asheville, N. C. The structure will house 50 electric cars and 50 buses on a site at Mud Cut just off French Broad Avenue.

Worcester Consolidated Street Railway, Worcester, Mass., has awarded a contract to the J. W. Bishop Company, 109 Foster Street, Worcester, for the construction of a garage on Grove Street to provide quarters for the buses, to include a repairing service. Henry R. Kent Company, Rutherford, N. J., is engineer and architect.

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ELECTRIC RAILWAY JOURNAL

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LUX
How
In telling of new p
and of new uses of all
product, and in show
how they aid and serv
Barron Collier
Uneeda Biscuit
COLLIER SERVICE
Car Card Advertising Almost Everywhere

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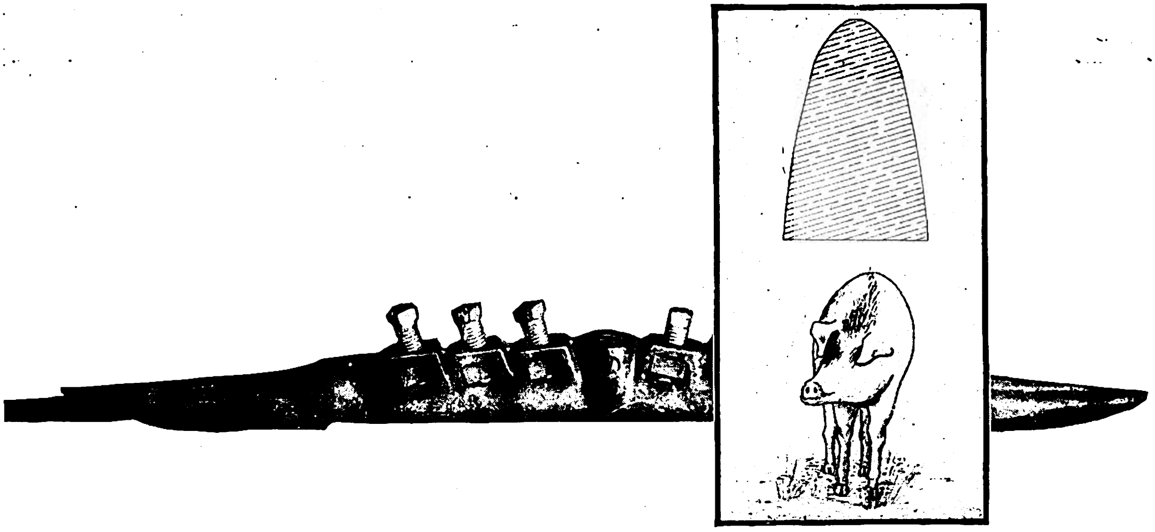
Long experience has established the basis on which car card advertising must be conducted in order to sustain this source of income.

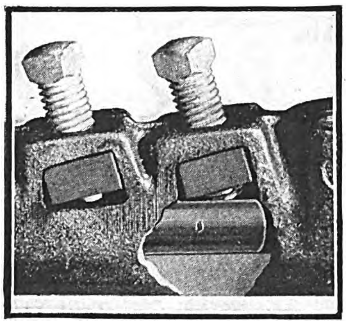
Barron G. Collier Inc.

Candler Bldg. ~ New York



Razor Back

The RB Trolley Splicer



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by
Keeping it UP
with
Westinghouse
Rocking Nuts

THIS new Westinghouse splicer has an under-run shaped like a razor-back hog—hence its name, RB.

Because of its tapered shape, coming to a rounded point at the bottom, the RB splicer rides on the bottom of the groove in the trolley wheel. Wear is almost entirely confined to rolling friction. Of grinding friction where the splicer rubs against the side of the wheel there is very little on tangent track.

Burning also is reduced—by the smooth under-run that is almost as smooth as plain wire. The complete transition takes place on a straight line.

The RB splicer is easy to install. Wires are inserted without bending. A pair of pliers is sufficient to tighten the set screws with rocking nuts. And how those rocking nuts do hold! Increased tension on the wire just makes them hang on tighter.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse
LINE MATERIAL

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Vol. 69
No. 26
Pages
1125-1166

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Even Across the Seas

IN A RECENT morning's mail ELECTRIC RAILWAY JOURNAL received subscriptions from the citizens of four foreign nations. Theirs was a delicate compliment both to our contributors and the publisher. Aside from revealing a breadth of circulation, the interest of these European subscribers who buy the JOURNAL unsolicited indicates the effectiveness of its publishing policy—in short, that the subject matter of every article should contain some element of general significance, some helpful thought or suggestions by which the industry as a whole may profit.

Those who serve the public have no country. There are no barriers to the common purpose of their efforts. As public servants they must draw from every source of inspiration if their achievements are to reach the highest plane. With this spirit, therefore, the JOURNAL welcomes its new subscribers from Vienna, Leningrad, Moscow, Berlin and Bologna. May its pages afford them a stimulus for greater activity and service in their chosen field, and make them conscious that their brothers across the seas consider them as seated around a great council table.

McGRAW-HILL PUBLISHING COMPANY, INC.
Tenth Avenue at 36th Street, New York, N. Y.
New York District Office, 285 Madison Ave.

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1927

Cable Address: "Machinist, N. Y."
Publishers of
Engineering News-Record
American Machinist
Power
Chemical and Metallurgical Engineering
Coal Age
Engineering and Mining Journal
Ingenieria Internacional
Bus Transportation
Electric Railway Journal
Electrical World
Industrial Engineer
Electrical Merchandising
Radio Retailing
Construction Methods
Electrical West
(Published in San Francisco)
American Machinist—European Edition
(Published in London)

The annual subscription rate is $4 in the United States, Canada, Mexico, Alaska, Hawaii, Philippines, Porto Rico, Canal Zone, Honduras, Cuba, Nicaragua, Peru, Colombia, Bolivia, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Chile and Paraguay. Extra foreign postage to other countries $3 (total $7 or 29 shillings). Subscriptions may be sent to the New York office or to the London office. Single copies, postage prepaid to any part of the world, 20 cents.
Change of Address—When change of address is ordered the new and the old address must be given, notice to be received at least ten days before the change takes plac.
Copyright, 1927, by McGraw-Hill Publishing Company, Inc.
Published weekly. Entered as second-class matter, June 23, 1908, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Number of Copies Printed, 6,240

Advertising Index—Alphabetical, 53; Classified, 48, 50, 53; Searchlight Section, 47

Trade-Mark
FARADOID
High-Efficiency Pin-Type
Porcelain Insulators
Patented

Introduced—
Nine Years Ago

Today

WESTINGHOUSE ELECTRIC

The Accepted Type

ALMOST a decade ago, Westinghouse engineers departed from the then accepted types of insulators and developed a new insulator. It was based on an accepted scientific principle—the principle of the electrostatic field evolved by Faraday.

In the years that followed, minor changes were made—developing a theoretically perfect design into a workable, serviceable insulator. But the fundamental principle was not changed, and today it is recognized as the logical basis for multipart insulator design.

The Faradoid is the Westinghouse pin-type insulator whose design is based on the principle discovered by Faraday.

Porcelain
you can install
—and forget

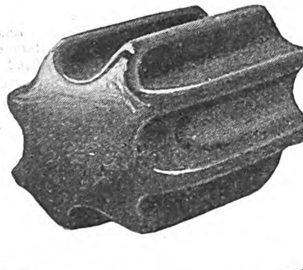
—because science—not tradition—governs the making of **all** Westinghouse porcelain and insulators.

—precision processes, at every stage, are the rule.

—never is anything taken for granted at any time.

—even slight variations in materials are compensated for.

First the design—then the materials—then the method—and then, a vigilance that permits no compromise.



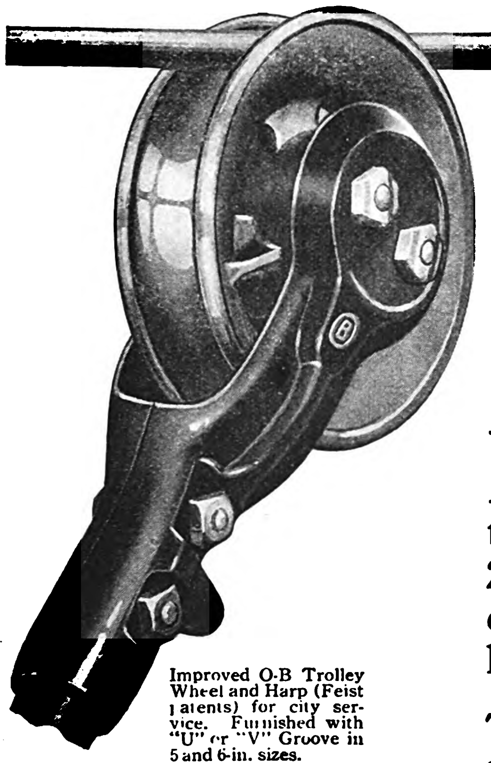
Westinghouse Electric & Manufacturing Company
Westinghouse High-Voltage Insulator Works
Derry, Pa. Emeryville, Cal.
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1927

Westinghouse

X91113

JUL 5 1927 RY. ENG.



Improved O-B Trolley Wheel and Harp (Feist patents) for city service. Furnished with "U" or "V" Groove in 5 and 6-in. sizes.

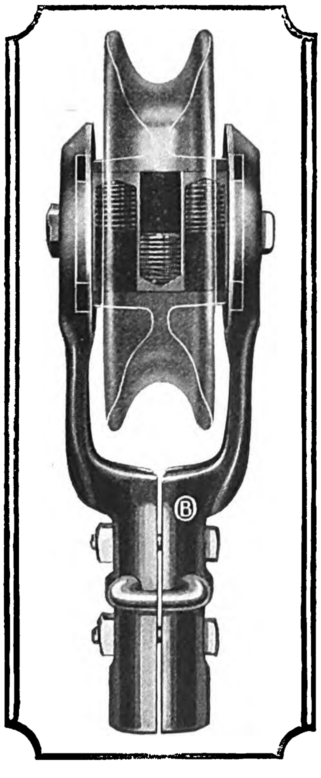
Just How Costly Are Old Style Trolley Wheels?

RECENT investigations show that, including maintenance, inspections and replacements, the *average* cost for Old Style Trolley Wheels is 29.8 cents per 1,000 car miles. Some properties estimate that Old Style Trolley Wheels cost no less than 74 cents per 1000 car miles!

These figures do not include such intangible costs as, for instance, excessive wear on the overhead due to "chattering" and arcing wheels; damage to the car roof due to dripping oil; pull-ins, line breaks, and delayed schedules due to badly worn wheels.

When the *total cost per year* of Old Style Trolley Wheels is considered, is it any wonder that electric railways are welcoming the new and *Improved* O-B Trolley Wheel which costs only 19 cents average per 1,000 car miles; that needs no inspections, oiling, or maintenance from the day it is put in service; that averages 15,000 or more miles and runs as smoothly for the last thousand miles as the first, without "chattering", and with the minimum of arcing and wear on the overhead?

Electric railways that measure progress in terms of cost reduction and more efficient operation will be satisfied with nothing less than the *Improved* O-B Trolley Wheel and Harp (Feist patents) after a comparison with present trolley wheel costs and service. For an analysis of Old Style Trolley Wheel costs and complete information on the *Improved* O-B Trolley Wheel and Harp, address



Phantom view showing fully automatic graphite lubricating plugs used in Improved O-B Trolley Wheel and Harp.

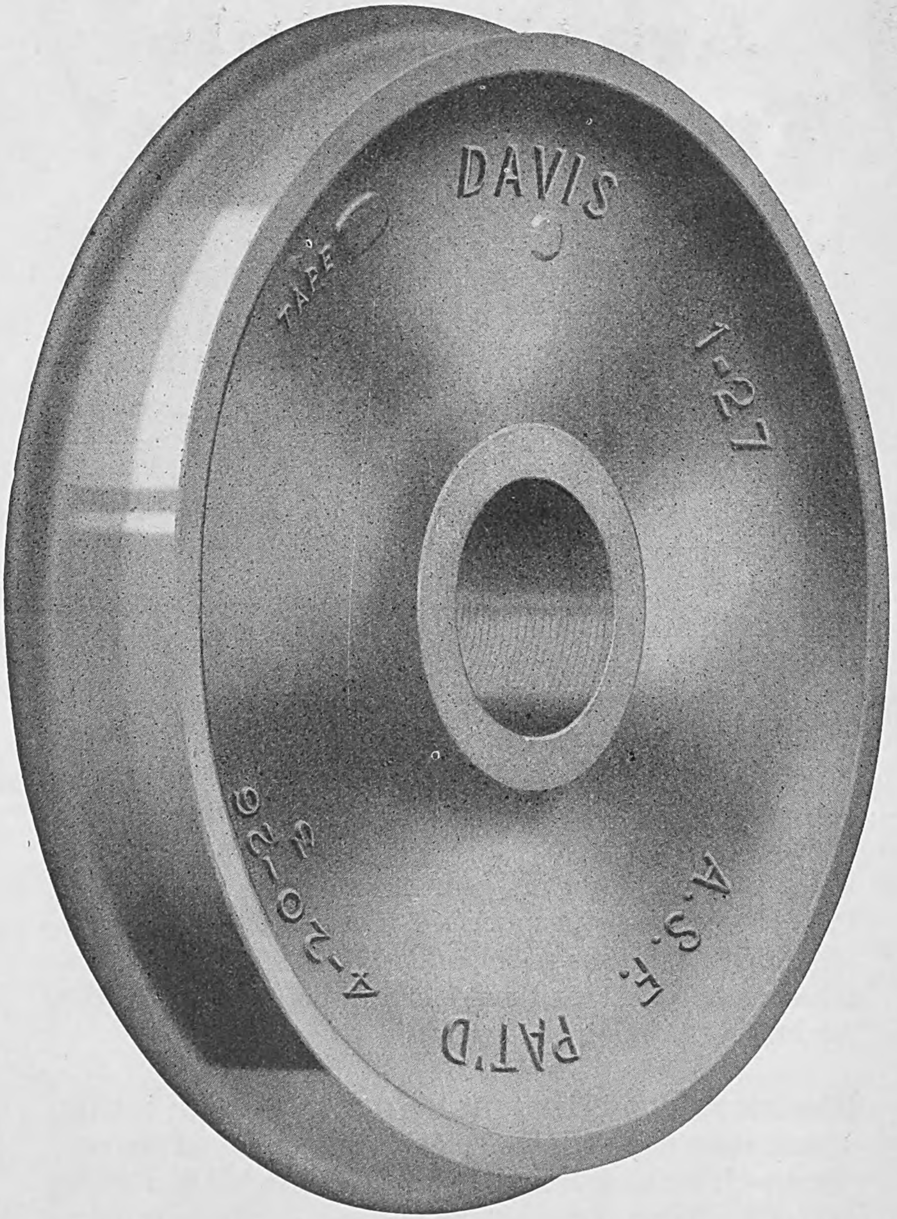
Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
420C

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

REAL WHEEL STEEL



A WHEEL can be no better than the material of which it is made.

Davis "One-Wear" Steel Wheels are made of Real Wheel Steel.

It contains elements that when heat-treated produce physical characteristics that make the "One-Wear" idea practical.

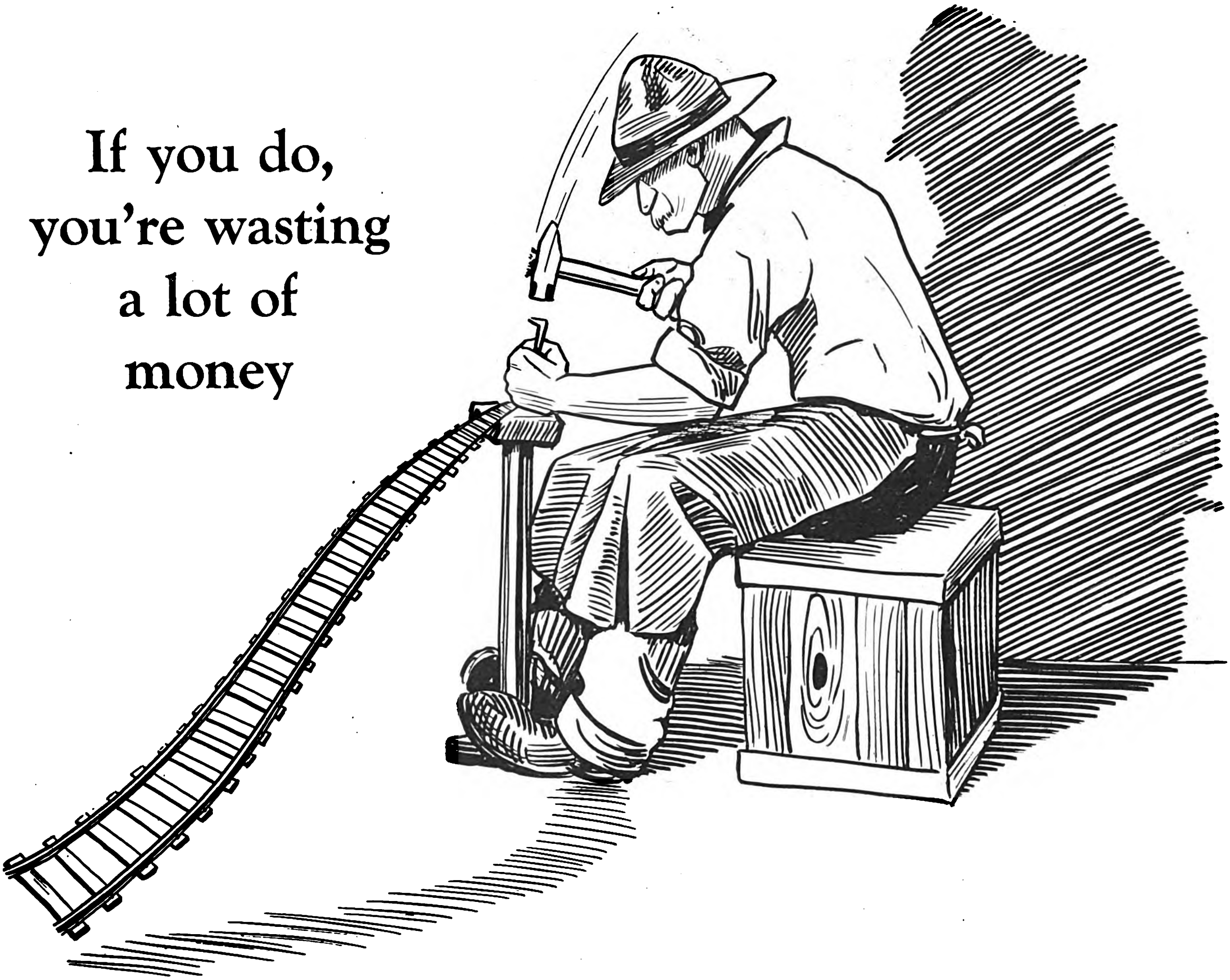
IT IS A REAL "ONE-WEAR" WHEEL METAL

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

Do you half-sole your track?

If you do,
you're wasting
a lot of
money



It's better to put down a foundation that will *out-wear* the rail—than to experiment with ties and foundations that break up, warping rails and demanding constant maintenance and replacement.

Steel Twin Ties, in concrete, will out-wear the rails. When the rail head wears down new rails can be laid on the old foundation. No more half-soling, you've got a permanent lasting foundation.

And the remarkable part of it all is that Twin Ties have cost less to install, and less over a period of years on hundreds of installations throughout the country.

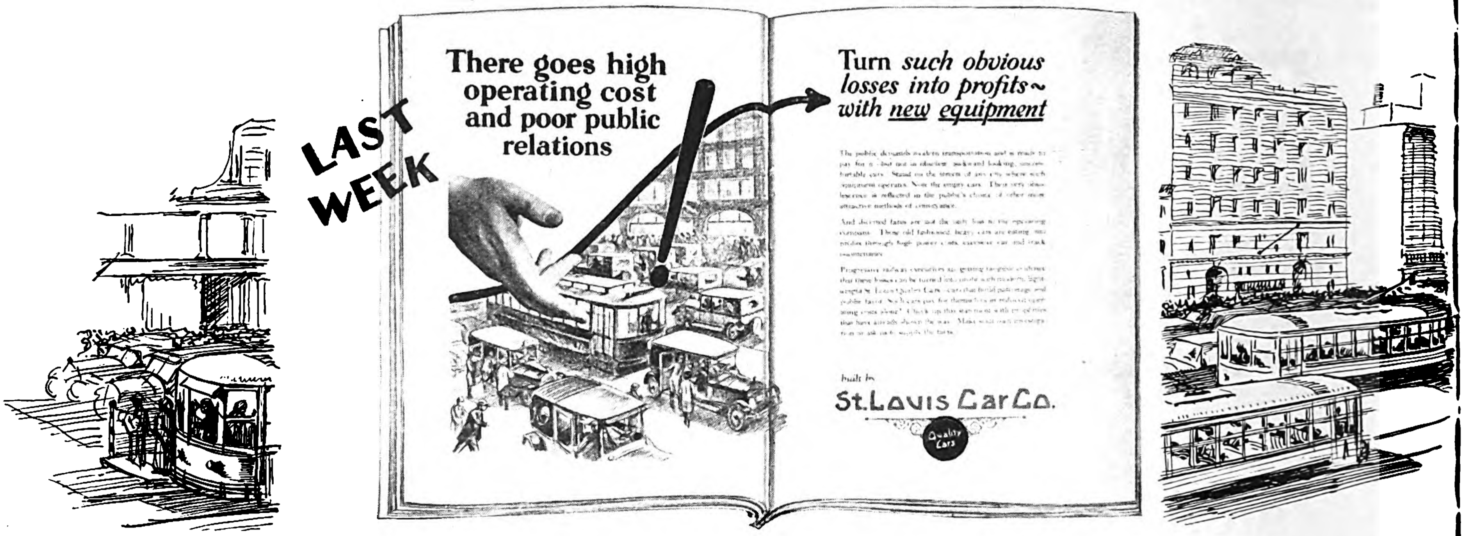
Quick deliveries now for work that is in a hurry.

The International Steel Tie Co.
Cleveland, Ohio

PAVED TRACK NOTEBOOK

Look it up in your "Paved Track Note Book"

Steel Twin Tie Track



There goes high operating cost and poor public relations

Turn *such obvious losses into profits*~ *with new equipment*

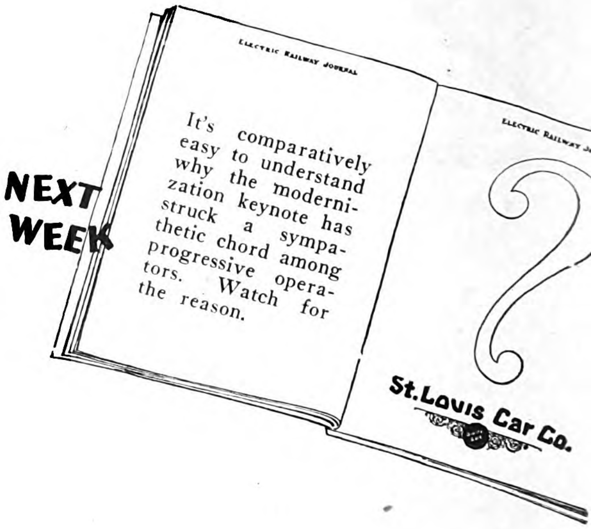
built by

St.Louis Car Co.

Quality Cars

In the light of PRESENT DAY knowledge and experience the advantages of the modern equipment have become obvious. Heavy, uneconomical and unattractive cars must be relegated to the scrap pile. They are mill stones that crush out profits and block progress. The only policy safe to follow today is that indicated by the cost sheets of modernized properties.

St. Louis Car Company stands ready to help you.



ELECTRIC RAILWAY JOURNAL

It's comparatively easy to understand why the modernization keynote has struck a sympathetic chord among progressive operators. Watch for the reason.

ELECTRIC RAILWAY JOURNAL

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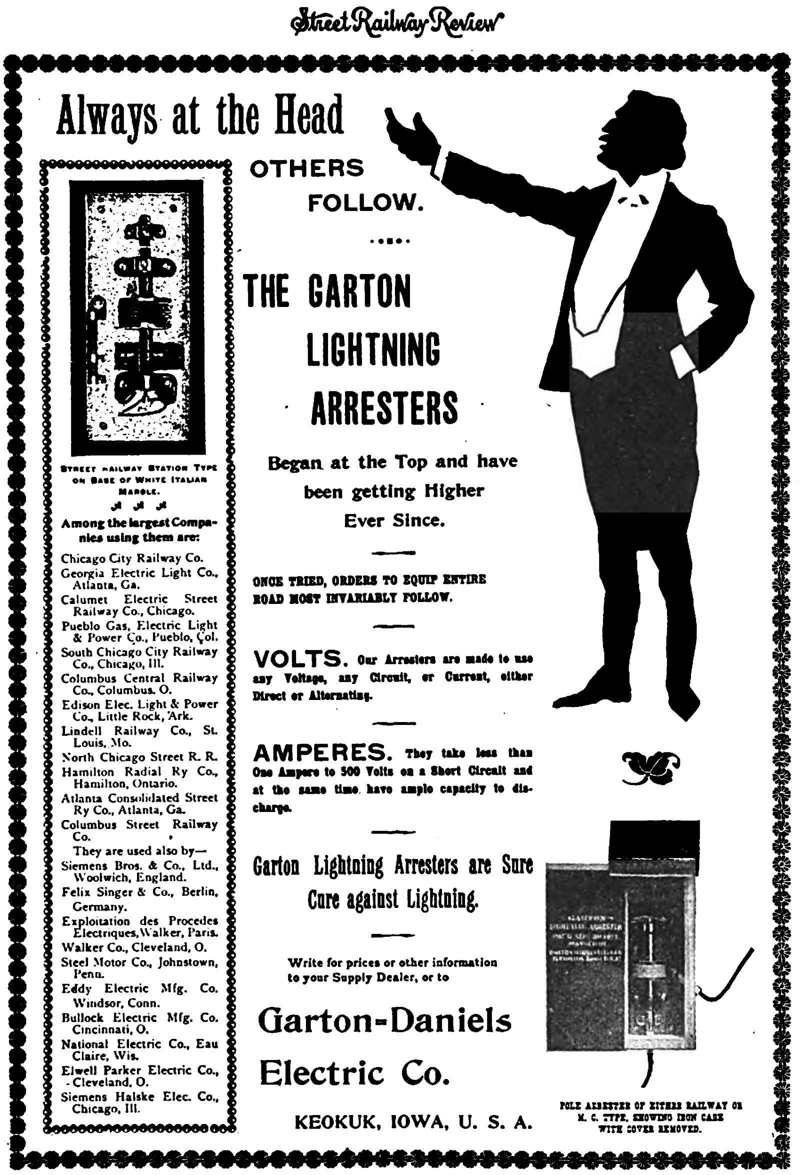
St. Louis Car Co.

St. Louis Car Co.

Quality Cars



Street Railway Review

Always at the Head

OTHERS
FOLLOW.

THE GARTON
LIGHTNING
ARRESTERS

Began at the Top and have
been getting Higher
Ever Since.

ONCE TRIED, ORDERS TO EQUIP ENTIRE ROAD MOST INVARIABLY FOLLOW.

VOLTS. Our Arresters are made to use any Voltage, any Circuit, or Current, either Direct or Alternating.

AMPERES. They take less than One Ampere to 500 Volts on a Short Circuit and at the same time have ample capacity to discharge.

Garton Lightning Arresters are Sure Cure against Lightning.

Write for prices or other information
to your Supply Dealer, or to

**Garton-Daniels
Electric Co.**

KEOKUK, IOWA, U. S. A.

POLE ARRESTER OF EITHER RAILWAY OR M. C. TYPE, SHOWING IRON CASE WITH COVER REMOVED.

STREET RAILWAY STATION TYPE ON BASE OF WHITE ITALIAN MARBLE.

Among the largest Companies using them are:

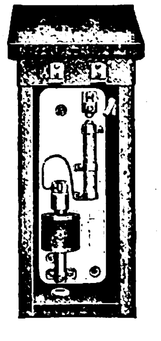
Chicago City Railway Co.
Georgia Electric Light Co., Atlanta, Ga.
Calumet Electric Street Railway Co., Chicago.
Pueblo Gas, Electric Light & Power Co., Pueblo, Col.
South Chicago City Railway Co., Chicago, Ill.
Columbus Central Railway Co., Columbus. O.
Edison Elec. Light & Power Co., Little Rock, Ark.
Lindell Railway Co., St. Louis, Mo.
North Chicago Street R. R.
Hamilton Radial Ry Co., Hamilton, Ontario.
Atlanta Consolidated Street Ry Co., Atlanta, Ga.
Columbus Street Railway Co.

They are used also by—
Siemens Bros. & Co., Ltd., Woolwich, England.
Felix Singer & Co., Berlin, Germany.
Exploitation des Procedes Electriques, Walker, Paris.
Walker Co., Cleveland, O.
Steel Motor Co., Johnstown, Penn.
Eddy Electric Mfg. Co. Windsor, Conn.
Bullock Electric Mfg. Co. Cincinnati, O.
National Electric Co., Eau Claire, Wis.
Elwell Parker Electric Co., Cleveland, O.
Siemens Halske Elec. Co., Chicago, Ill.

30 years ago—

An ad published almost 30 years ago in the Street Railway Review (later the Electric Railway Journal) stated rather immodestly that the Garton-Daniels Lightning Arrester was "always at the head—others follow." It is significant that after thirty years the direct current types of the Garton-Daniels Arresters remain unchanged in principle and are to-day the most widely used lightning arresters for the protection of electric railway circuits.

ELECTRIC SERVICE SUPPLIES COMPANY, PHILADELPHIA, 17th & Cambria Sts.; NEW YORK, 50 Church St.; CHICAGO, Ill., Merchants Bank Bldg.; Pittsburgh, Bessemer Bldg.; Boston, 88 Broad St.; Detroit, General Motors Bldg.; Scranton, 316 N. Washington Ave.; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

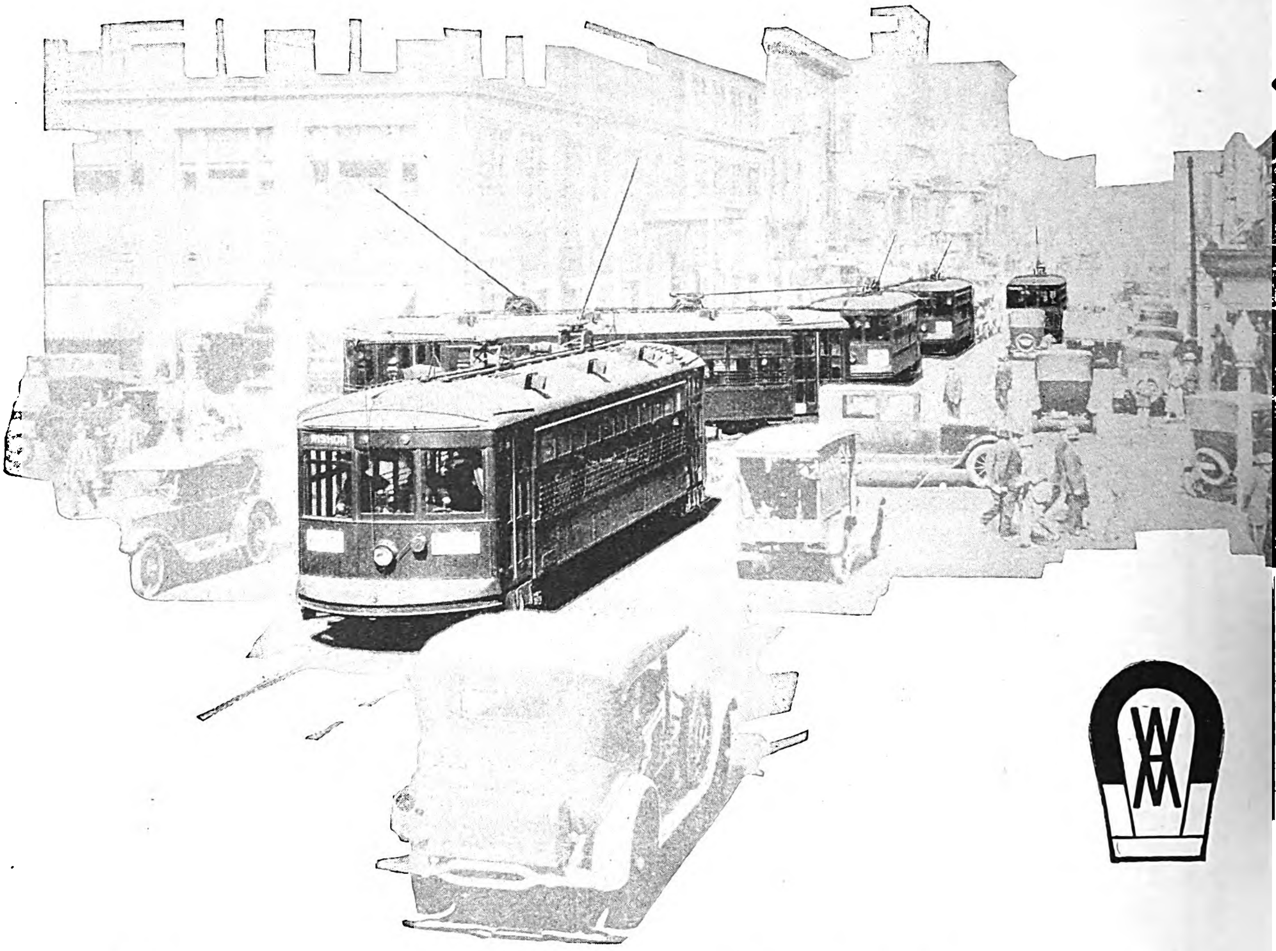


Present type of
600 volt
Direct Current Arrester

N.B. Some years ago the Garton-Daniels Electric Company was consolidated with the Electric Service Supplies Company.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY POWER AND INDUSTRIAL ELECTRICAL MATERIAL



Can your cars "hold their own"?

City streets have become so crowded that there is constant competition between the various elements of traffic for the right of way.

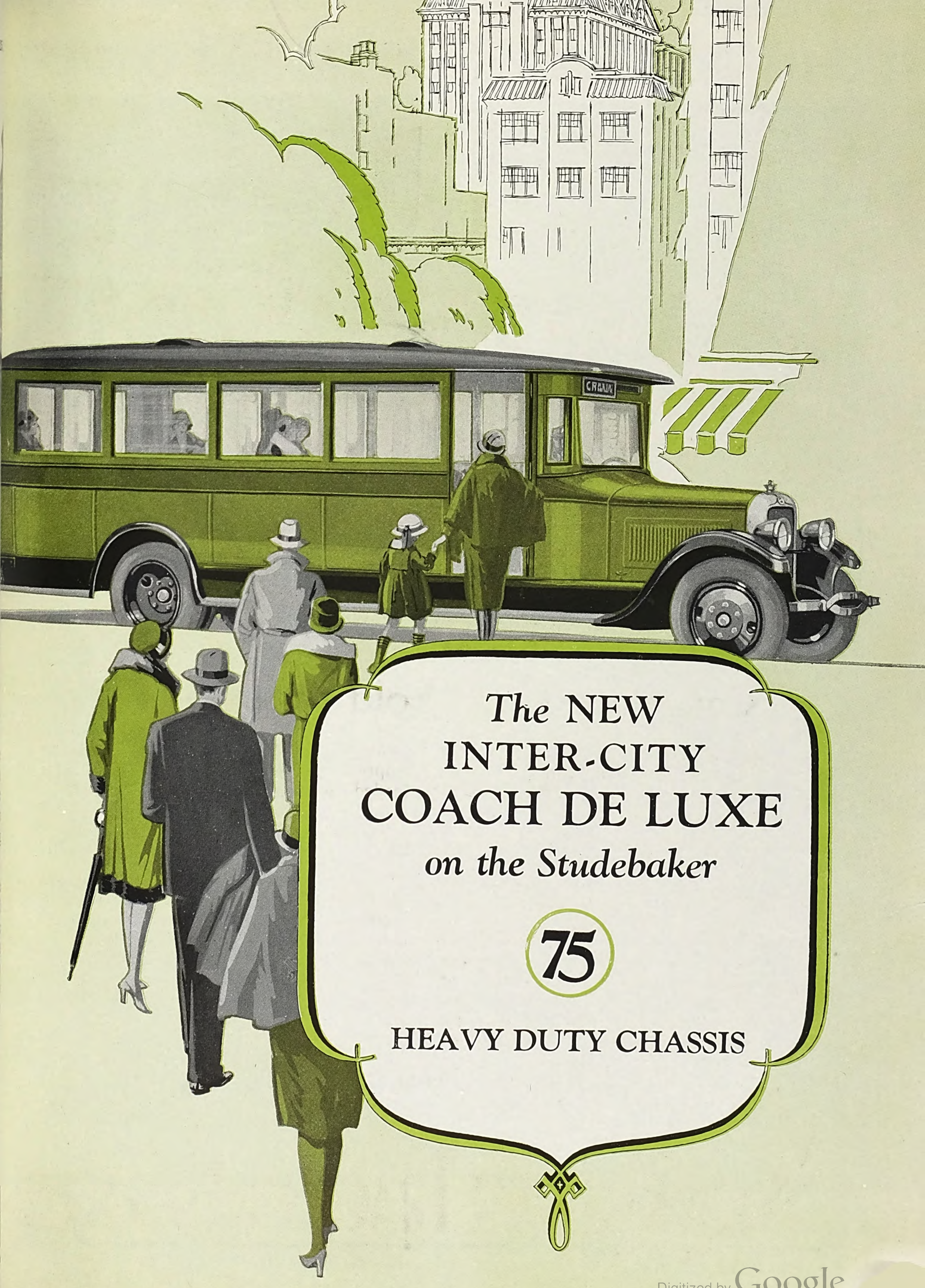
If street cars are to meet this condition and hold their own in the general traffic movement they must be as mobile as other conveyances that use the streets.

An effective means of increasing car mobility is to provide brakes that will permit short stops, and the consequent longer period of peak speed operation and shorter running time between stops. With ordinary brakes, however, the retarding force which is satisfactory for the empty car is less effective when the car is loaded, so that the stopping distance lengthens, and this usually happens just when other vehicles are also contending for the right of way.

The Westinghouse Variable Load Brake was designed to correct this condition. It automatically adjusts the retarding force as the weight varies, so that the stopping distance is constant throughout the range of car loading. This results in accelerated transportation service just when the greatest possible hauling capacity is needed most.

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works, WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

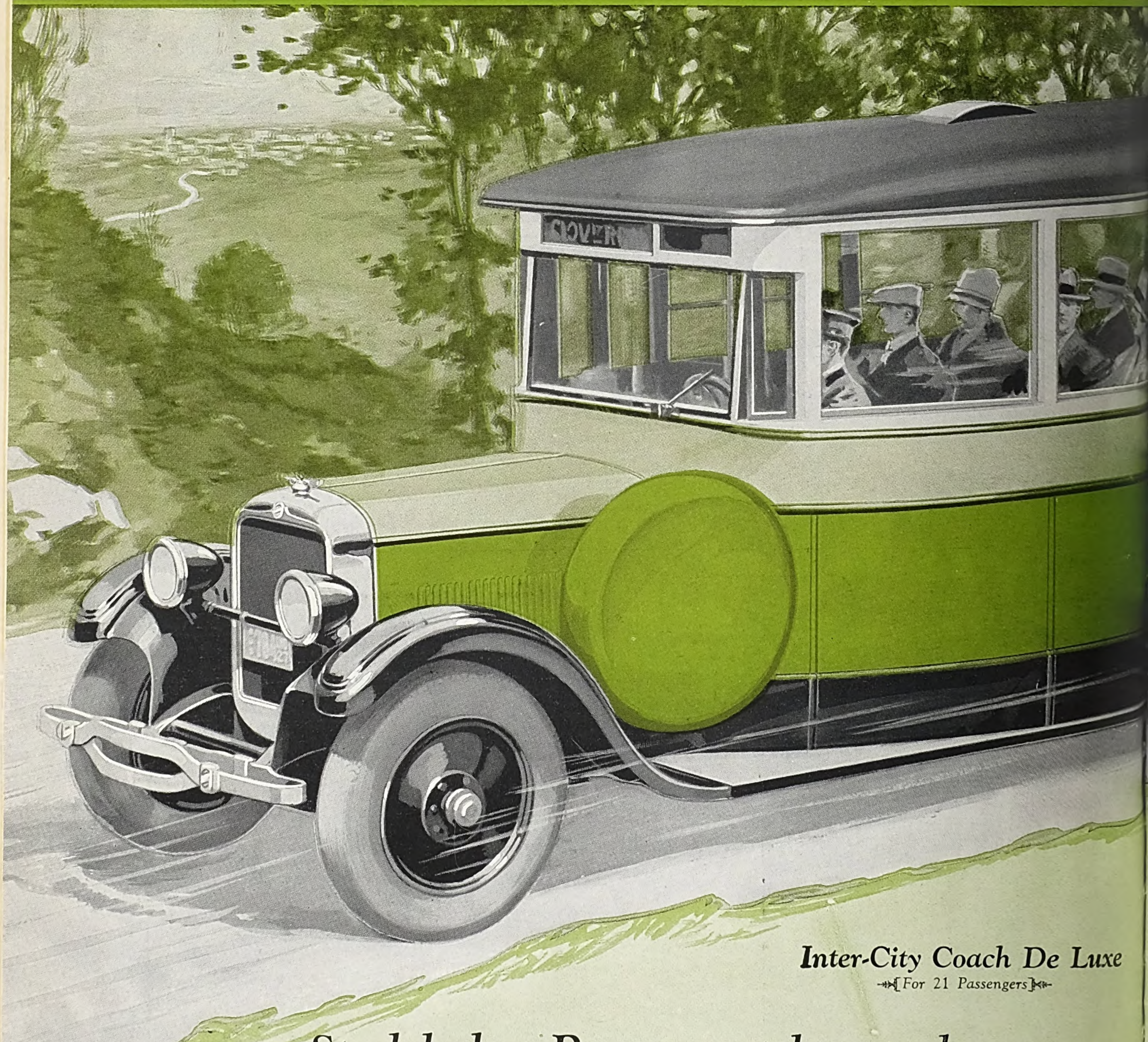


The NEW INTER-CITY COACH DE LUXE on the Studebaker

75

HEAVY DUTY CHASSIS

You Make More Money



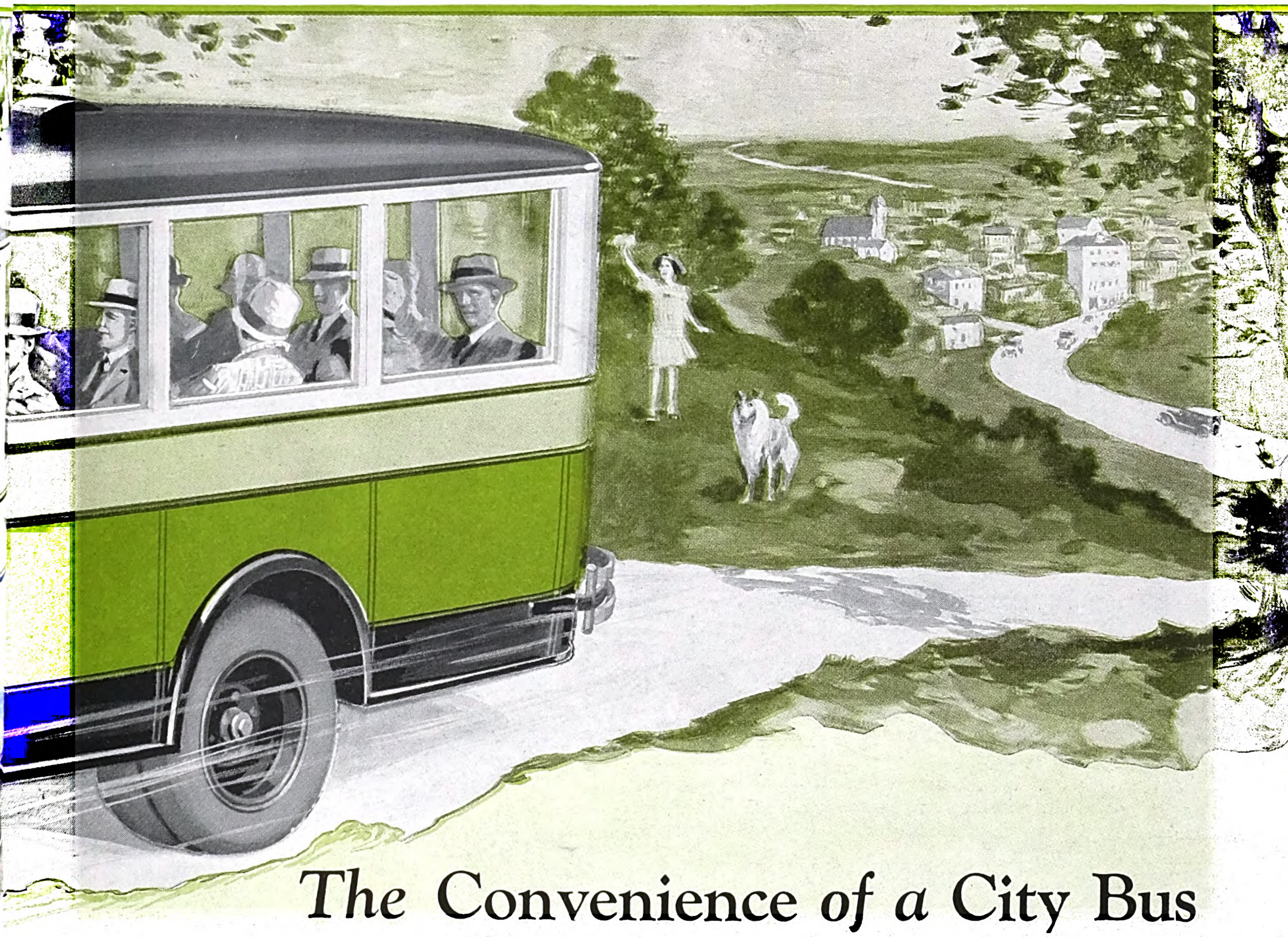
Inter-City Coach De Luxe
For 21 Passengers

Studebaker Busses cost less to buy— less to operate and less to maintain

ASK any Studebaker bus operator why he bought Studebakers and he will tell you that Studebaker busses give greater profits with less invested capital. For instance, Chas. F. Egli, manager of the White Star Line, Washington, Pa., operating 17 Studebaker busses and 4 truck-type busses says: "The 5 new Studebaker parlor cars recently added to our fleet were purchased because we have demonstrated that Studebaker equipment costs considerably less to operate and maintain and the initial cost is most attractive. The splendid appearance of our Studebakers attracts new patronage while their dependability permits us to operate our line on a definite schedule and comfortable riding qualities hold the good will of the riding public."

The New Studebaker 75

with Studebaker Equipment



The Convenience *of a* City Bus *with* Parlor Car Luxury

OPERATORS covering routes which pass through or join medium-size cities must necessarily give a combination city and inter-city service. Studebaker has anticipated the needs of inter-city bus operators and offers in the new Studebaker Inter-City Coach De Luxe a unit which contains many features that are far in advance of the current practice in bus design. In reality it is a new type of vehicle of marked beauty possessing city bus convenience and parlor car luxury.

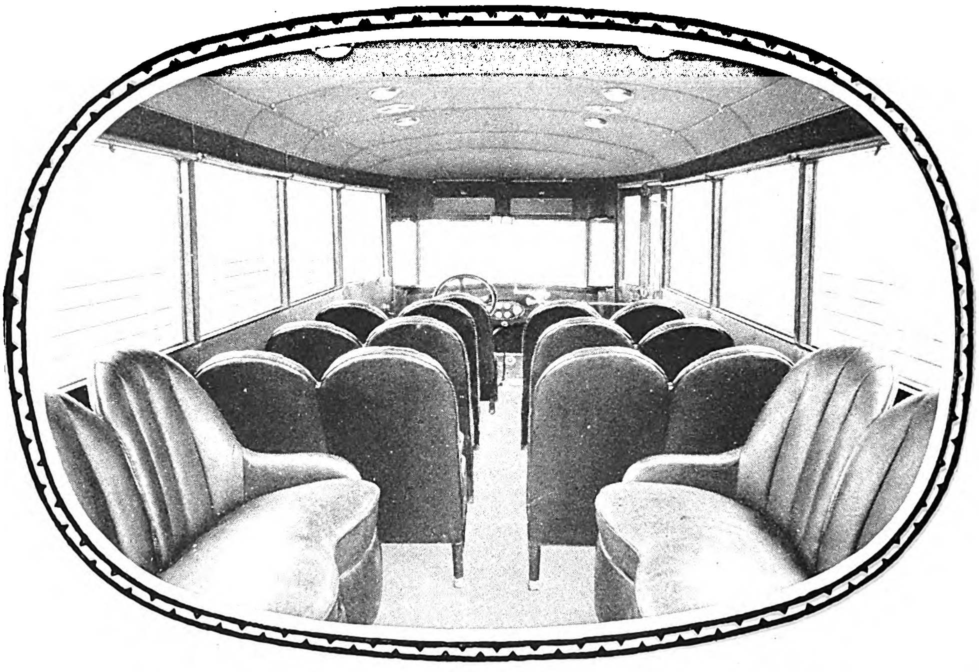
Superlative Comfort

For city service this De Luxe Coach meets present day traffic problems by providing an exclusive conveyance which will appeal to the better class of riders who are not interested in the ordinary truck-type bus. On inter-city routes it wins public preference because of the superlative comfort of the luxurious leather lounging seats spaced to provide ample leg room. Its extra large windows give uninterrupted vision; the spacious interior gives a greater sense of roominess than is found in the ordinary parlor coach.

Speed with Safety

Because of its abundant power and effortless steering, it is as easy to drive this coach as it is to drive an ordinary passenger car. According to the Society of Automotive Engineers' rating it has the most powerful bus chassis of its size and weight in the world. Loaded to capacity this coach glides quietly along the highway at permitted speeds with a smoothness alone attainable by a perfectly balanced mechanism and a power plant which is practically vibrationless. Smooth-acting four-wheel mechanical brakes of the self-energizing type enable the driver to safely negotiate heavy city traffic or ease around sharp curves with perfect safety. While traveling at 40 miles per hour this coach can be stopped in 71 feet, or in twice its own length at 20 miles per hour.

Heavy Duty Bus Chassis



Looking forward from the club section of the Inter-City Coach De Luxe. Note the deep, leather upholstered seats; ample aisle and head room.

Beauty and Dependability of Studebaker Busses Win Discriminating Riders

CARRIED in its own sub-frame is the famous Studebaker L-head motor, quiet, powerful and of notably long life. The transmission has four speeds forward and one reverse, giving greater driving range without excessive engine speeds, a feature of particular advantage in city operation and in hilly country or on long fast schedules.

Studebaker engineers have incorporated in the new Studebaker Inter-City Coach De Luxe every feature necessary for economy of operation and the safety and comfort of the riders. Passengers are naturally attracted to Studebaker busses because of their clean-cut appearance and regularity of service. The new Inter-City Coach De Luxe is a most distinctive looking bus. The black enamel fenders and disc steel wheels contrast sharply with the body. A wide letter strip is set off with two striped mouldings which carry out the stream-line effect from the cowl and hood. Heavy nickel-plated bumpers front and rear; nickel-plated radiator; spare tire carrier on the left; automatic windshield cleaner; and rear-vision mirror are standard equipment.

Prices of Studebaker Busses

Studebaker "75" Chassis only*	$3275.00
Studebaker "75" Parlor Observation Car*	6895.00
Studebaker "75" 21 Passenger Street Car bus*	5895.00
12 Pass. (including driver) cross-seat Sedan-Type	3935.00
15 Pass. (including driver) cross-seat Sedan-Type	4295.00
19 Pass. (including driver) cross-seat Sedan-Type	5050.00
18 Pass. (including driver) side entrance ParlorCar	5300.00
20 Pass. (including driver) Parlor Car De Luxe*	6150.00

*Includes dual rear wheels.

All prices f. o. b. factory. Purchase can be arranged on Liberal Budget Payment Plan.

Correct Ventilation and Heating

Proper ventilation and heating are two scientific problems that have been mastered in this new coach. Side windshield ventilators and two roof ventilators keep the air in constant motion. The wide windows held in grooves of deep felt are easily adjusted. In cold weather a constant flow of warm air from raised floor radiators insures an even distribution of heat.

Mounted on the Studebaker "75" Bus Chassis

The proved mechanical excellence of the "75" heavy duty chassis enables bus operators to meet time table schedules with due regularity. This chassis of 184 inches has nine heavy cross-members including two 3-inch tubular units at the center which give great rigidity to the frame. Every unit in this chassis, including the four-speed transmission, large double plate clutch, universal joints and extra heavy rear axle, is designed and built to give giant strength.

The Studebaker Corporation of America

SOUTH BEND, INDIANA

B-7

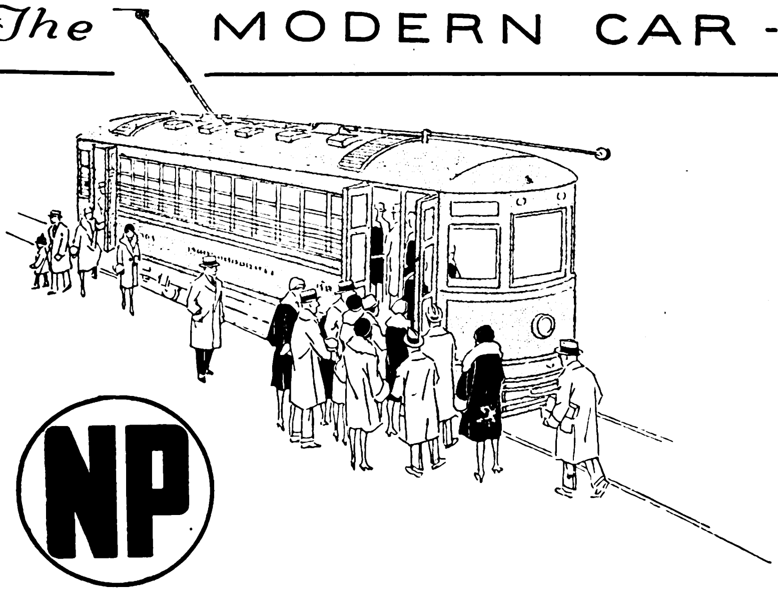
Mail this coupon for further particulars

THE STUDEBAKER CORPORATION OF AMERICA,
Dept. B, South Bend, Ind.

We have........busses at present.
Check below the Studebaker Bus about which you desire information.

Type: Sedan........Parlor Car...............
Street-Car Type.............
Capacity: ....Passengers.
Name...
Address...
City..............................State..........

The MODERN CAR - [No. 1 in a series]



NP

Partially Modern or *Thoroughly* Modern?

A STREET car is *truly* modern only when *thoroughly* modern.

It must meet all modern needs *in full.*

The demand for faster schedules, for example, can be attained by the use of the latest type of door and step equipment.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

PHILADELPHIA
1010 Colonial Trust Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

The appeal of appearance! Passenger Preference! Public Interest and Friendship!

At last year's Convention these phrases indicated a very definite trend of thought in our industry. This year they will be uttered again with a strong conviction of their importance. Operators now have plenty of proof that progressive merchandizing of electric railway service produces results.

Further than this, operating statistics from many of the most successful modernized properties prove that Cincinnati BALANCED DESIGN has produced cars so attractive, so thoroughly modern and so distinctive that public approval becomes a certainty.

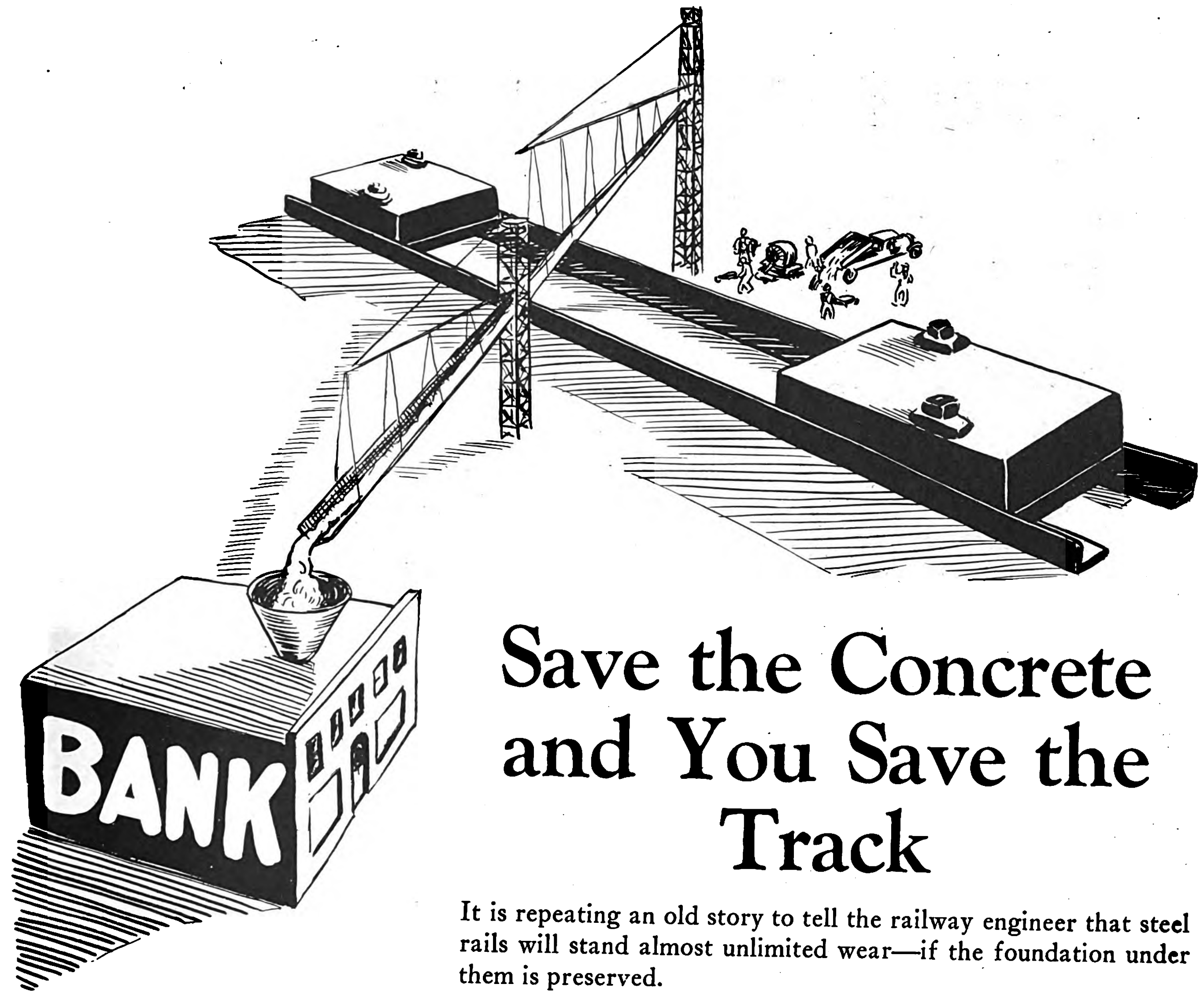
BALANCED DESIGN does more. It establishes a principle of car building of proved soundness from the viewpoint of operating economy.

When you buy Cincinnati Lightweight NEW Cars you make no experiments. Tangible results can be predicted with more than usual certainty.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI
New
CARS

A step ahead of the modern trend



Save the Concrete and You Save the Track

It is repeating an old story to tell the railway engineer that steel rails will stand almost unlimited wear—if the foundation under them is preserved.

But, because track foundation under paving cannot be constantly ballasted up as steam roads do, the only recourse for street railways is concrete foundation.

But concrete track foundation does not stand vibration. Some means must be provided to absorb the vibration of the cars running over the track.

The answer—Dayton Ties, of course.

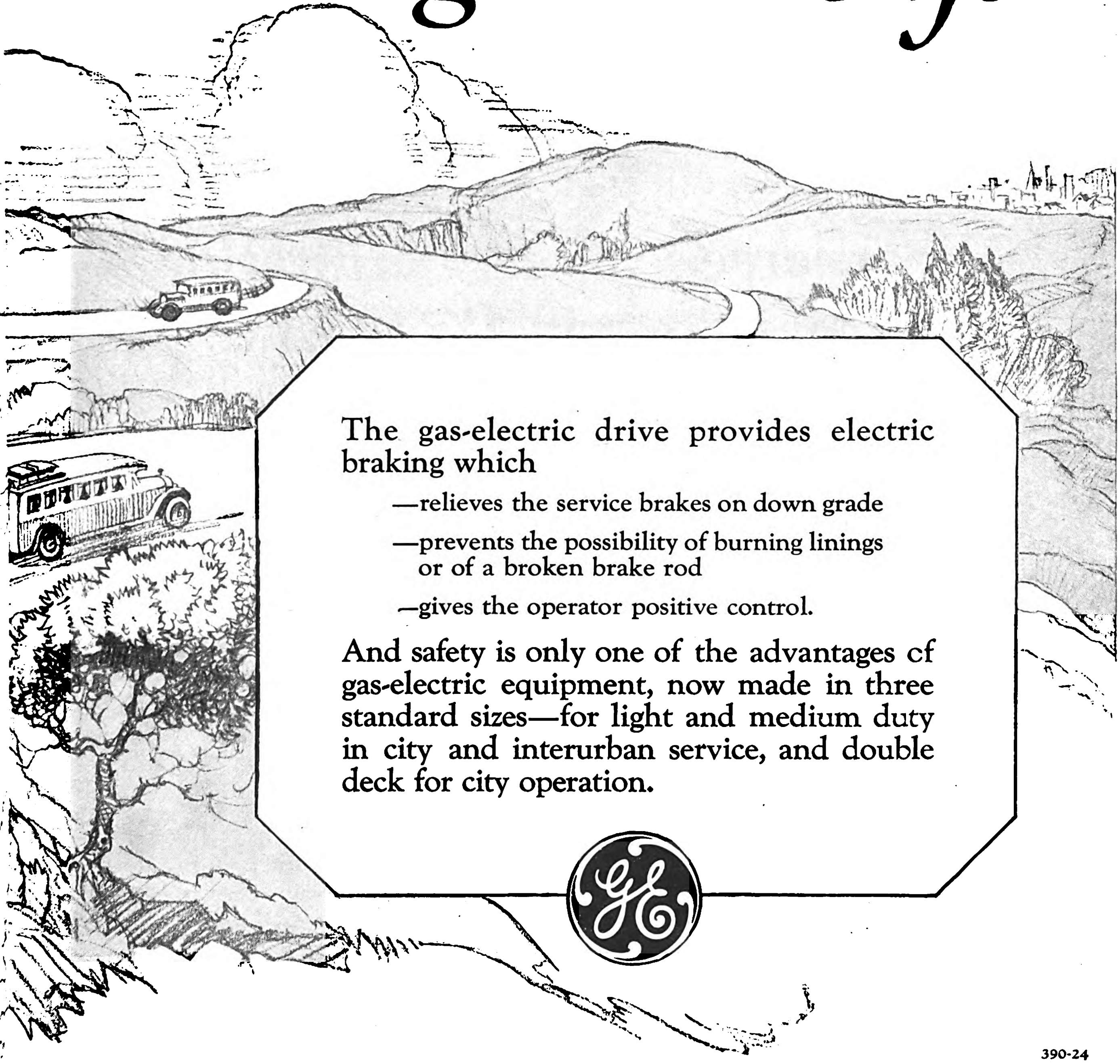
Designed and constructed to completely absorb this vibration, they have clearly demonstrated their ability to do so for years. Since the inception of Dayton Ties fifteen years ago, more than 125 cities have put in one to ten installations each, and not a foot of it has ever failed, or cost a penny of maintenance.

Where track has been opened—the concrete foundation, the ties and rails have always been in perfect condition—not a sign of deterioration.

The Dayton Mechanical Tie Co.

DAYTON, OHIO

DRIVE makes down-grades *safe*



The gas-electric drive provides electric braking which

—relieves the service brakes on down grade

—prevents the possibility of burning linings or of a broken brake rod

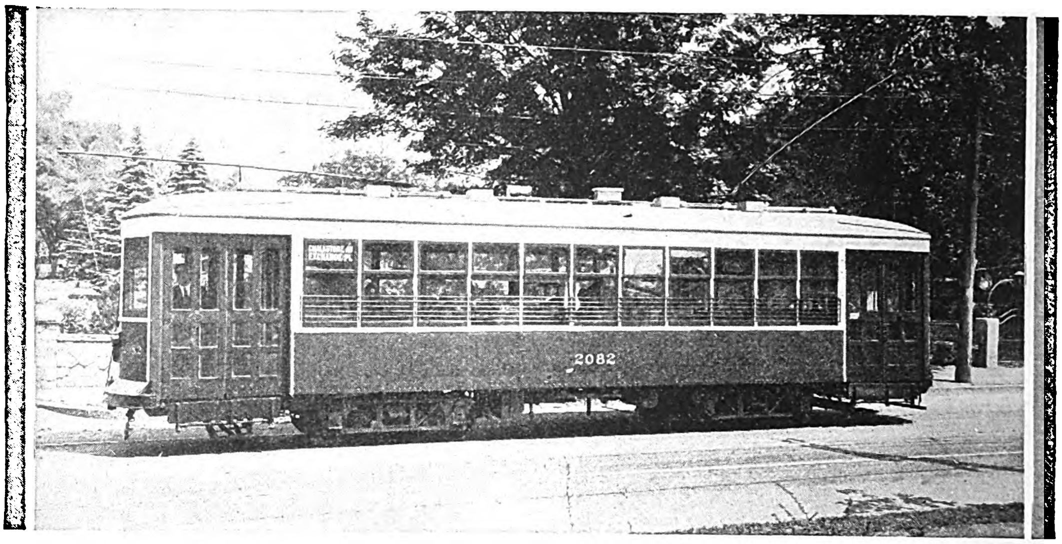
—gives the operator positive control.

And safety is only one of the advantages of gas-electric equipment, now made in three standard sizes—for light and medium duty in city and interurban service, and double deck for city operation.

390-24

ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES



The 175 modern cars in Providence, R. I., are each equipped with four GE-265 Motors and K-Control. These 700 G-E Motors are among the 40,000 modern motors that are helping electric railways to give dependable service.

What large-scale modernization has done in Providence

Since 1921 the United Electric Railways Company, Providence, R. I., has placed in operation 175 modern cars—79% of its cars in basic service. These had made about 13,800,000 car-miles prior to Jan. 1, 1926.

In 1925 operating costs were 36.77 cents per car-mile, compared with 39.91 in 1921, and this even though a complete overhauling of cars has been in progress for 1½ years.

Maintenance costs per car-mile for Account No. 30 (passenger and combination cars) and for Account No. 33 (electrical equipment) were reduced respectively 10% and 20% for 1925 as compared with 1921.

Pull-ins per 1,000 miles were reduced to 0.292 in 1925, as compared with 0.67 for 1921, a reduction of more than 50%.

The greatest saving has been the reduction of nearly 20% in platform expense, although two-man car operators now receive 9% higher and one-man car operators nearly 20% higher wages.

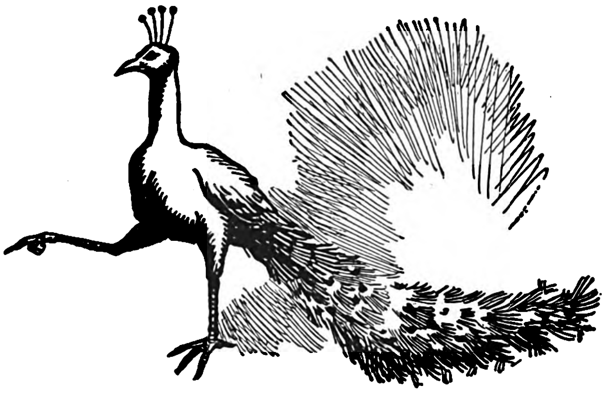
The Providence management found that modern one-man, two-man cars transport passengers more safely and more economically; that they are superior to its converted one-man cars because they accelerate faster, consume less power, and reduce track wear; that they reflect favorably on the company and on the community.

330-28

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

Have you ever asked why the superiority of some things is never questioned?



Here is the answer

Acknowledged superiority is won through long continued and unfailing performance. The acknowledgment takes the mighty eloquent form of universal use.

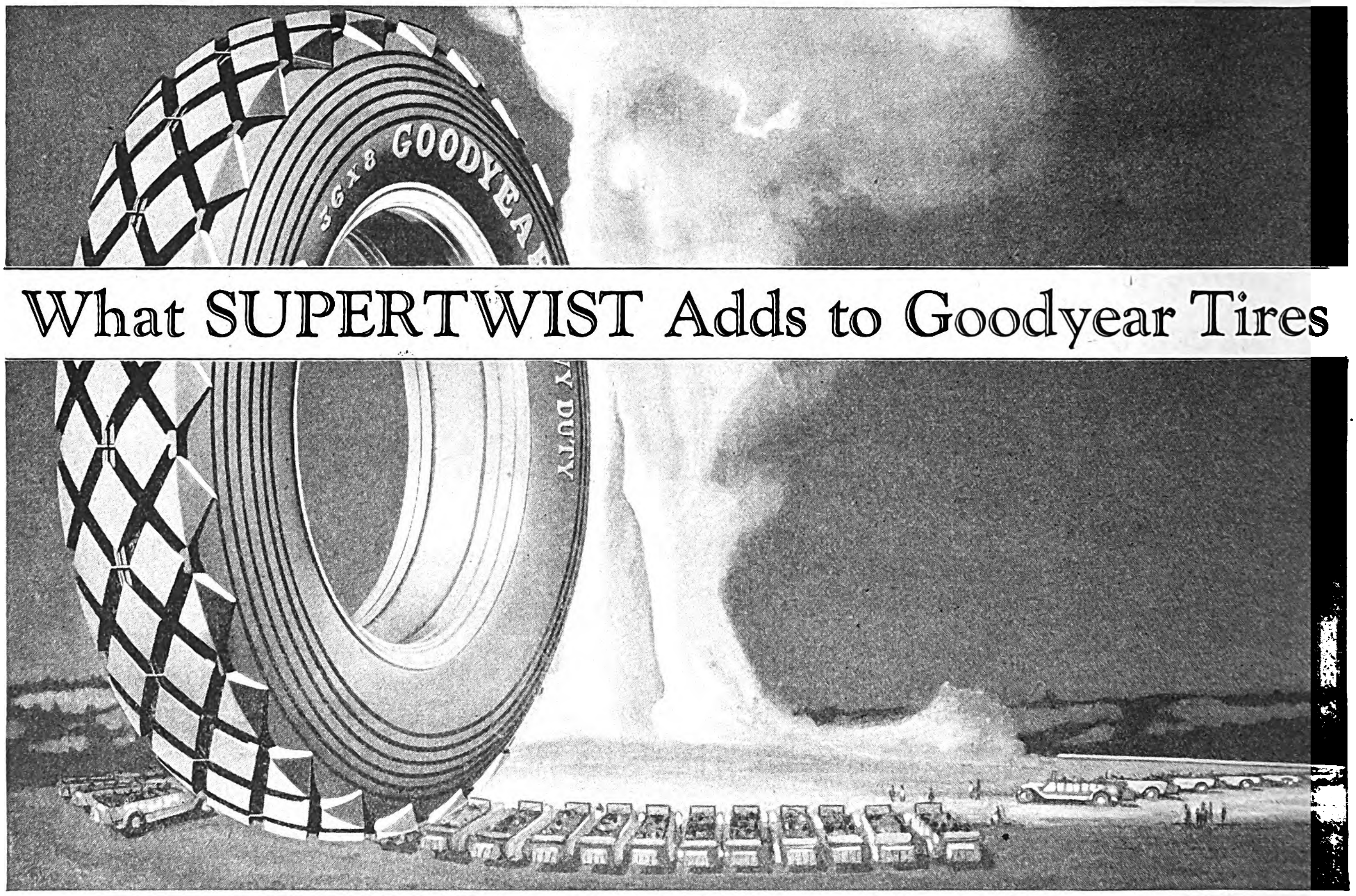
Peacock Staffless Brakes are found on most of the modern cars in use today. Why? They are fast, they have three times the braking power of ordinary equipment. They guarantee the meeting of an emergency.

The entire story of Peacock Staffless Brakes will take a little more time to tell than you can spend right now. Write us for their record and let us have the data upon which to base an estimate showing what your installation will cost.

"Peacock"
Reg. U.S. Patent Off.
Staffless Brakes

National Brake Company
890 Ellicott Square, Buffalo, N. Y.

Canadian Representative
Lyman Tube & Supply Co., Ltd., Montreal, Can.



What SUPERTWIST Adds to Goodyear Tires

In Yellowstone National Park, the tires used exclusively by the Yellowstone Park Transportation Company are Goodyear Tires of the type illustrated here—the Goodyear Heavy Duty All-Weather Tread Pneumatic

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other injuries. It thus insures virtually *double* the *carcass* life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

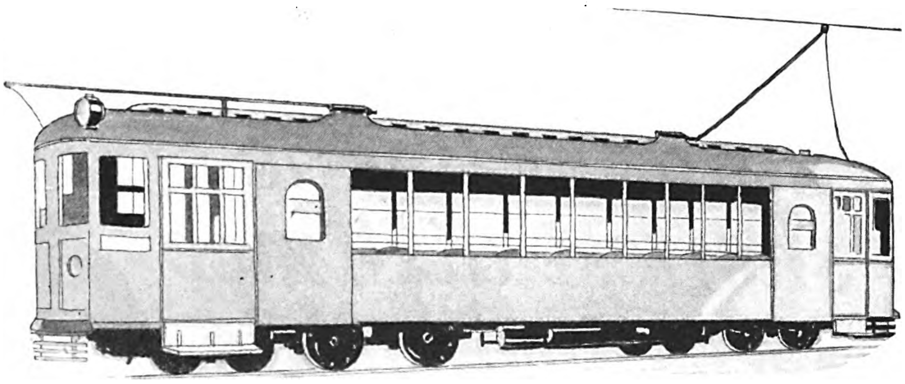
These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

Copyright 1927, by The Goodyear Tire & Rubber Co., Inc.



What's the use of mincing words?

A Duco finish outlasts the old type finishes by such a wide margin that no operating company can afford to disregard it.

The hard, lustrous surface of Duco stands wear indefinitely.

There is only ONE Duco
. . . DU PONT Duco

DU PONT DUCO
REG. U.S. PAT. OFF.

Duco is the correct finishing material for railway equipment. For information write to E. I. du Pont de Nemours & Co., Inc., Chemical Products Division, Parlin, N. J., 2100 Elston Ave., Chicago, Ill., 569 Mission St., San Francisco, Cal.

PAINTS - VARNISHES - ENAMELS - DUCO

A straight line is the shortest distance between two points

CLEVELAND PNEUMATIC TOOL CO
CLECO
GRUSS
CLEVELAND, O

LOWER maintenance cost—longer life of chassis and body! These are the two points every fleet owner concedes as vital in the profitable operation of motor trucks and busses.

Air Springs are the straight line—the sure, smooth road . . . . the shortest distance between these points. Air Springs float the chassis on cushions of air that absorb the road shocks and vibration—check and practically eliminate all recoil.

From thousands of bus and truck operators who have adopted Air Springs as standard equipment come amazing records of far less breakage and repair bills—of cargoes protected against damage due to shifting—of increased bus patronage due to supreme riding comfort—of lengthened life of chassis and body.

The savings thus effected soon pays for the small initial cost of Air Springs. Thereafter they pay regular dividends on the total investment of your trucks and busses for years—and years—and years.

THE CLEVELAND PNEUMATIC TOOL CO.
Cleveland, Ohio

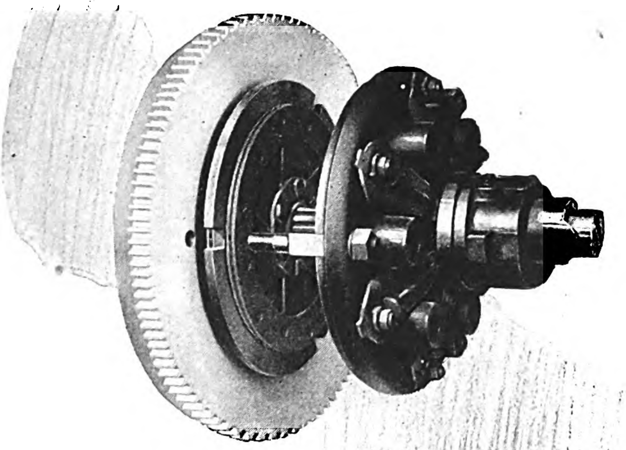
GRŪSS
Sleeve Type
AIR SPRING

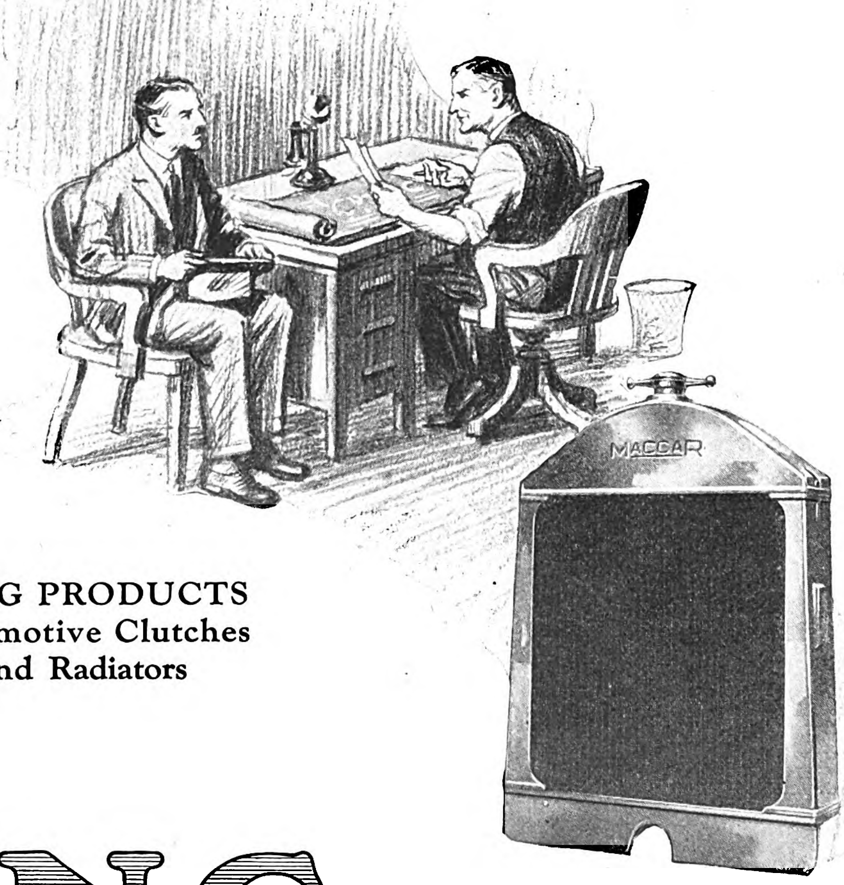
WESTINGHOUSE
Piston Type
AIR SPRING

THE SHOCK ELIMINATORS FOR TRUCKS-BUSSES-PASSENGER CARS

EXPERIENCE

Years of experience in the design, manufacture and practical installation of Long Clutches and Radiators fits this organization to offer practical service from both an engineering and manufacturing standpoint. This experience is at the disposal of manufacturers who may wish to use it.





LONG PRODUCTS
Automotive Clutches
and Radiators

LONG

LONG MANUFACTURING CO., DETROIT, MICHIGAN

The Foremost Insurance Companies offer you

REDUCED PREMIUMS

on your Public Liability Insurance

if you reduce accidents

The opposite page tells you how you can save money through the Experience Rating Plan.

Protex GLASS for SAFETY

means MORE *safety* LESS *accidents* LOWER *premiums*

If you own 5 or more busses and pay over $1,000 a year for Public Liability Insurance the old line companies calculate your premium with regard to the losses you caused during the previous two years. If during successive years you show a decrease in accidents you get a lower premium under their Automobile Experience Rating Plan.

PROTEX GLASS is the only motor bus protective glass on the market economically possible for motor bus safety. It will not scatter. It is brilliant, solid, and will not discolor. A fine strand of steel wire, solidly imbedded in the glass and running horizontally every two inches holds the pieces together when the glass breaks. There is no flying glass! And 65% of all collision injuries are flying glass injuries.

PROTEX will reduce the number of your accidents. It will save you money on your public liability premiums.

We shall be glad to quote you on your requirements. Begin now to earn lower premiums under the Experience Rating Plan of the *foremost insurance companies in America.*

Send for booklet today!

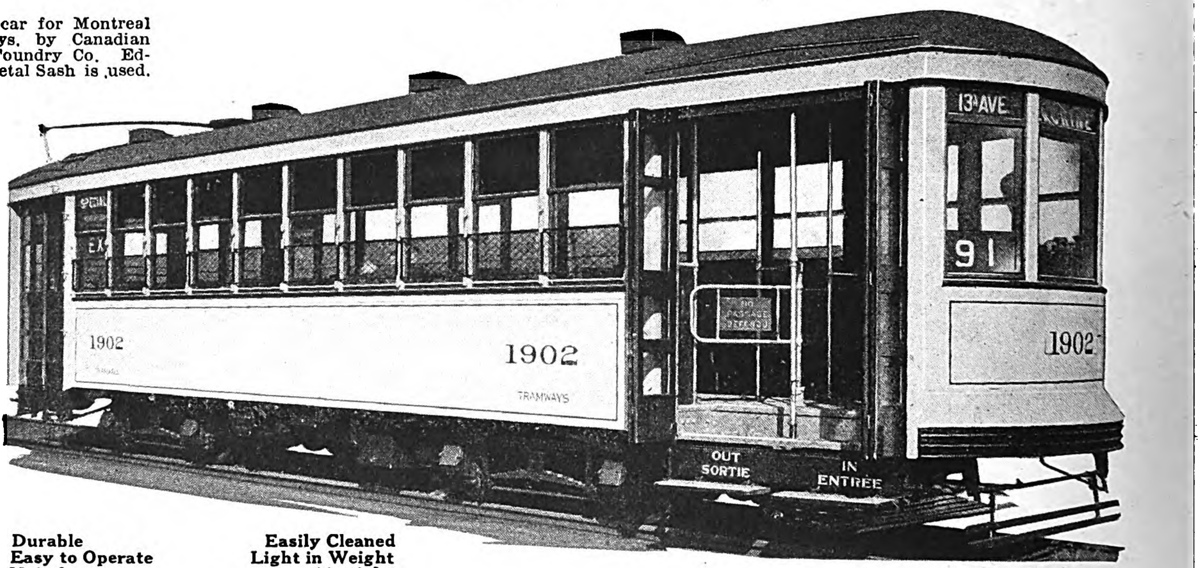
PROTEX GLASS COMPANY
220 FIFTH AVENUE NEW YORK

Protex
GLASS for SAFETY

Manufactured by **THE MISSISSIPPI GLASS COMPANY**

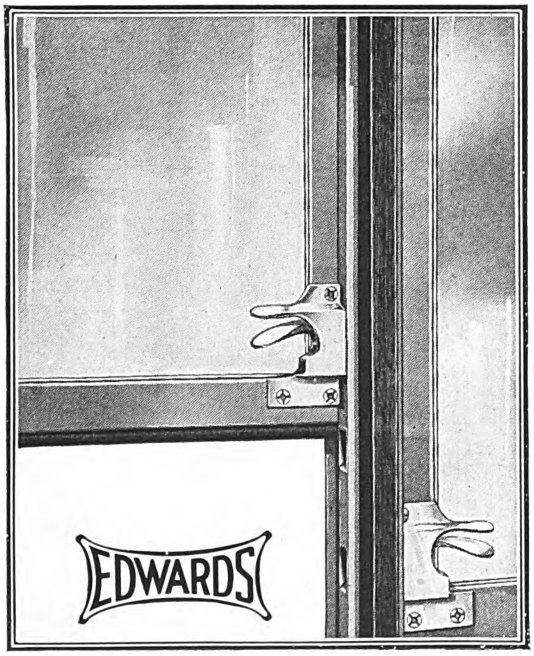
windows
DO MAKE A DIFFERENCE
in *winning* good will

Modern car for Montreal Tramways, by Canadian Car & Foundry Co. Edwards Metal Sash is used.



Durable
Easy to Operate
Noiseless

Easily Cleaned
Light in Weight
Air-tight



YOU can measure the future of your operations by the extent to which you modernize your equipment.

Edwards Metal Sash wins good will because it meets the modern trend in car design.

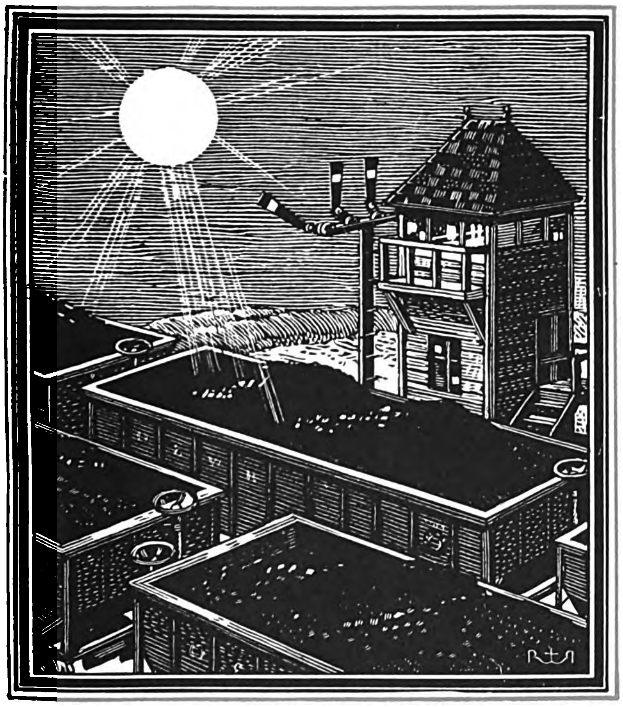
Old-fashioned, noisy, drafty, heavy, fist-defying windows are replaced in Edwards construction with modern, silent, air-tight, smooth-sliding metal sash that gives a maximum of clear vision.

Car builders can furnish Edwards Metal Sash in a type to fit your needs. Specify it on your next order, and ask us to send you your copy of our Catalog S which describes all types of Edwards Metal Sash.

O. M. EDWARDS COMPANY
SYRACUSE, N. Y.
New York Chicago
Canadian Representatives: Lyman Tube & Supply Co., Ltd.,
Montreal and Toronto

Edwards Metal Sash

Sold 140 Carloads of coal— *in hot weather*



IT WAS SWELTERING May weather in Omaha—a bad time, you might think, to sell coal. Yet a coal company manager and his assistant compiled a list of 200 dealers in Nebraska, Iowa and Missouri who were good winter customers. Two men in three days made the calls, the charges approximating $200. They sold 140 carloads, $21,000 worth. Ordinarily it took three salesmen two months to cover this same territory. Never before in hot weather had sales run so high.

FROM ALL KINDS OF BUSINESSES come reports of the use of long distance calls to get more accomplished, at less cost. Sometimes a task can be done in days by telephone that otherwise would take months. Business can be secured that otherwise would be lost. Salesmen and executives can conserve their productive time and so increase the good results of their work.

Long Distance is as important to inter-community and inter-sectional business as the local telephone is to local affairs. How can any business concern reach its greatest development without a regular use of long distance calls?

Anywhere is as close as your telephone. Is there some distant call that should be made now? You'll be surprised how little it will cost. . . . . . *Number, please?*

BELL LONG DISTANCE SERVICE

a smooth track area condition at the rail"

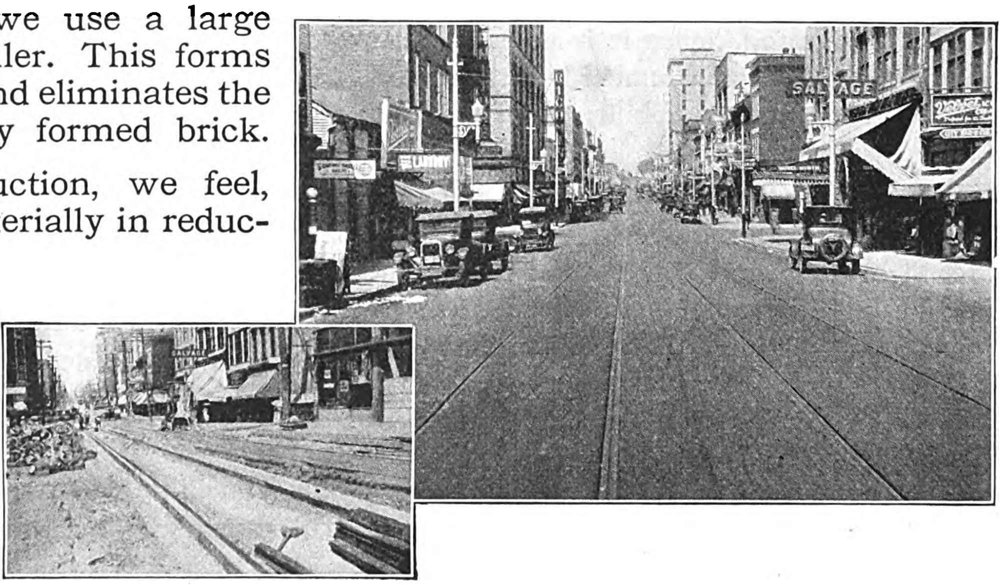
"WHERE brick construction is used," said Chas. T. Long, Resident Engineer of the Public Service Company, Portsmouth, Ohio, "the installation and maintenance of street railway tracks present some rather unique problems.

"We have accomplished much toward the solution of these difficulties by using an asphaltic cushion between the rails and the brick. This method of construction gives us a square, flat surface against which to lay the brick, and a water-tight condition at the rail, as well. Then, inside the rail, we use a large section of rail filler. This forms our flangeway and eliminates the need for specially formed brick.

"Such construction, we feel, has aided us materially in reducing track noise, and in keeping the track area smooth."

It is significant that in Carey Elastite System of Track Insulation, the Portsmouth Public Service Company has found the solution to their difficulties, as Mr. Long points out above. Write for full information about this remarkable development.

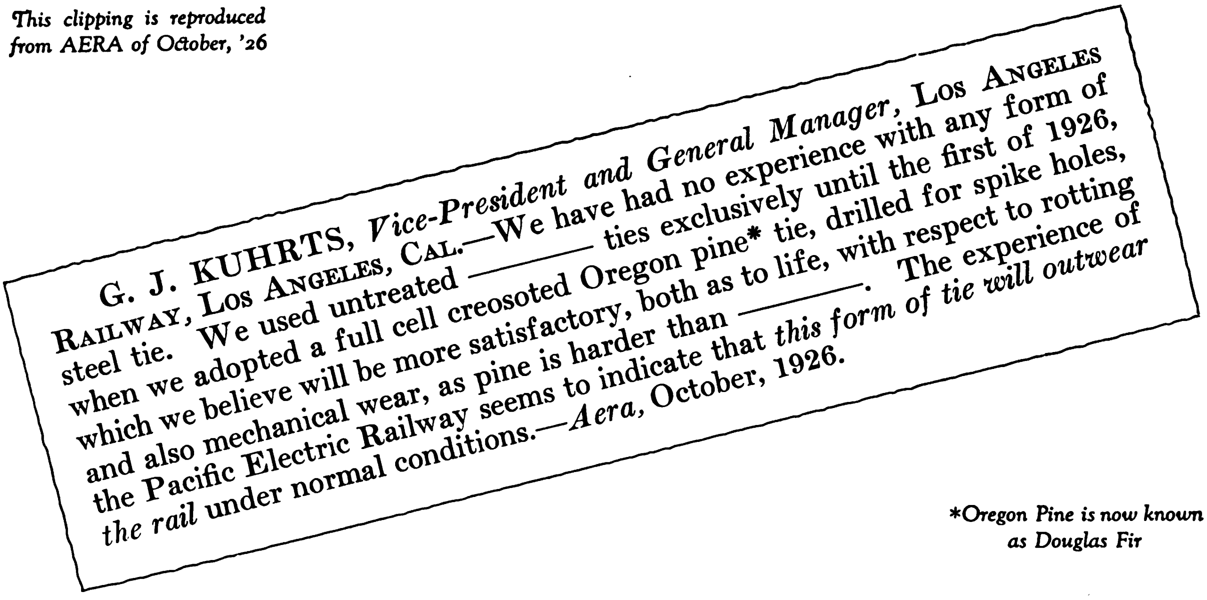
The Philip Carey Company
Lockland, Cincinnati, Ohio



Views of the Portsmouth Public Service Company tracks on Chillicothe Street, Portsmouth, Ohio. In the photo of the finished tracks, note the excellent condition of the flangeway and the smooth surface in the track area.

Carey Elastite
REG. U.S. PAT. OFF.
TRADE MARK REGD. U.S. PATENT OFFICE
SYSTEM OF TRACK INSULATION

This clipping is reproduced from AERA of October, '26



G. J. KUHRTS, *Vice-President and General Manager*, LOS ANGELES RAILWAY, LOS ANGELES, CAL.—We have had no experience with any form of steel tie. We used untreated ——— ties exclusively until the first of 1926, when we adopted a full cell creosoted Oregon pine* tie, drilled for spike holes, which we believe will be more satisfactory, both as to life, with respect to rotting and also mechanical wear, as pine is harder than ———. The experience of the Pacific Electric Railway seems to indicate that *this form of tie will outwear the rail* under normal conditions.—*Aera*, October, 1926.

**Oregon Pine is now known as Douglas Fir*

Making durability *doubly* durable

DOUGLAS FIR stands high among woods in resistance to decay, being excelled in durability only by such woods as the cedars and cypresses. 85% to 90% of a Douglas Fir log is heartwood, hence it is an easy matter to obtain Douglas Fir lumber and timbers in *all heartwood* where durability under exposure is necessary.

The very properties of Douglas Fir that make it naturally durable—particularly its high heartwood content and its lack of permeability to water—also make preservative treatment more of a problem than with spongy woods. On the other hand, with woods of spongy grain that are easily creosoted, go coarse grain, large knots and lower strength values than in close-grained Douglas Fir.

But today the scientific treatment of Douglas Fir—doubling and tripling its durability—is a commercial process that has long since passed the experimental stage. Several plants are specializing on the preservative treatment of Douglas Fir, and numerous railroads have installed and are successfully operating apparatus for the same purpose. Proper methods of impregnation retain the inherent strength of Douglas Fir—and treated timbers can be used at the same working stresses as untreated—a factor of importance in connection with structural timbers.

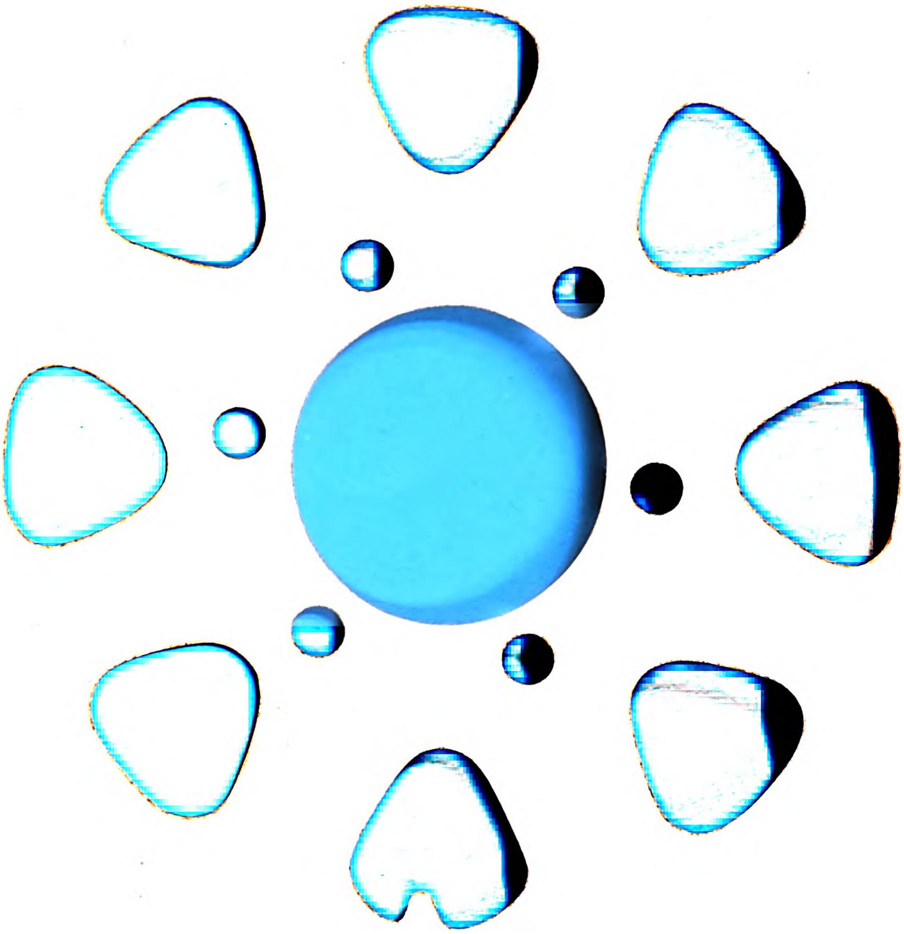
When you require lumber and timbers—in any size and length—that must be strong and durable under adverse conditions, specify Douglas Fir—treated if you think it necessary. Douglas Fir is obtainable in every important lumber market—at a reasonable price.

We will be glad to send you complete technical data for your files, and to answer questions that may arise regarding the uses and treatment of Douglas Fir. *Address*, West Coast Lumber Bureau, 562 T Stuart Building, Seattle, Washington.

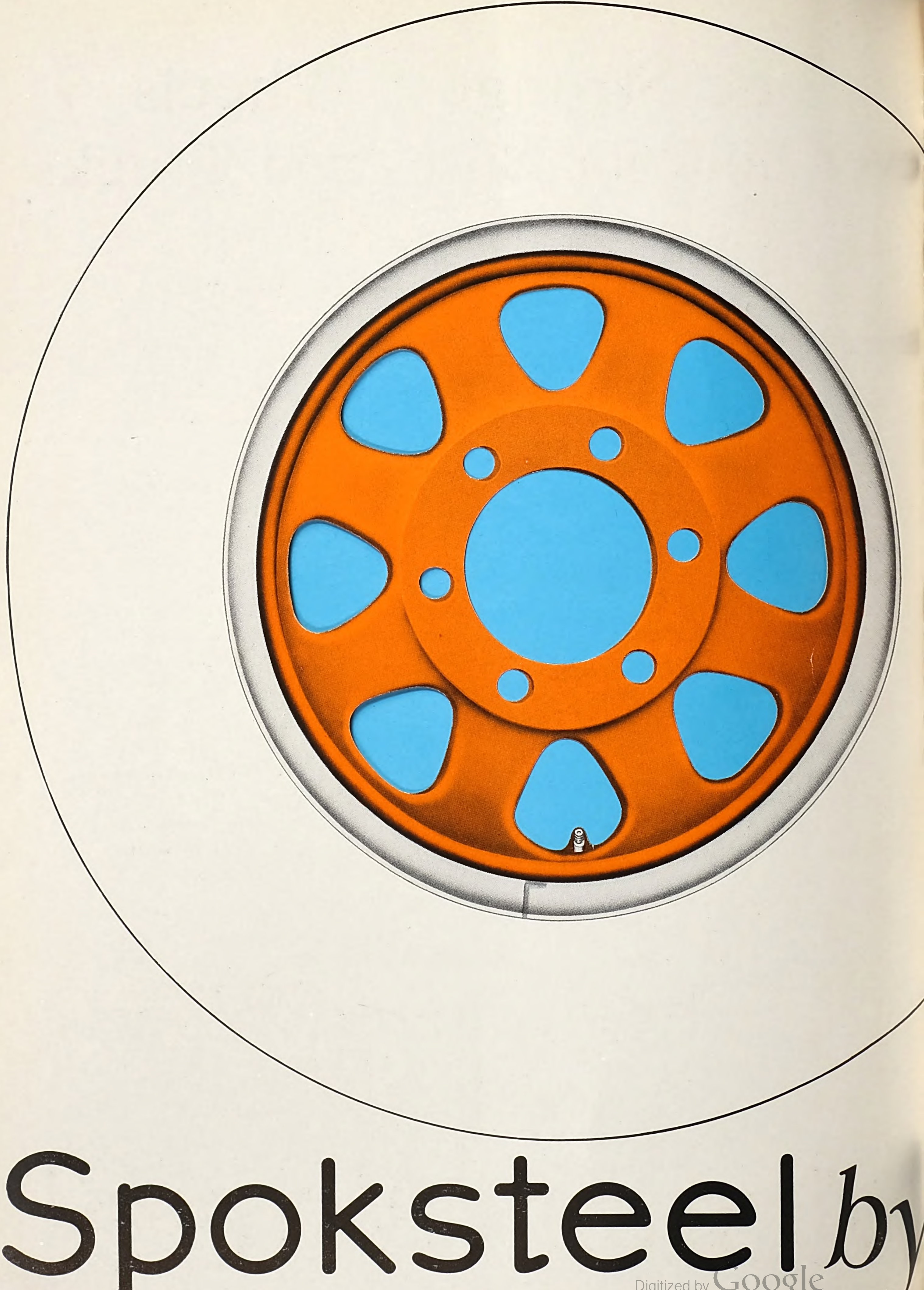
Durable Douglas Fir
America's Permanent Lumber Supply

W120R

Important West Coast Woods — Douglas Fir - West Coast (Sitka) Spruce - West Coast Hemlock - Western Red Cedar



The Strongest Wheels ever built for Buses and Trucks


Spoksteel by

The Strongest Wheels ever built for Buses and Trucks

A Product of the World's Largest Wheel Manufacturers

Demountable at the Hub—Interchangeable on Hubs for Dual Steel Wheels

The Spoksteel wheel combines the super-strength of a one-piece forged steel wheel member with the convenience and other recognized advantages of spoke construction. No previous type of wheel has ever approached the Spoksteel average of durability, safety, weight-saving, coolness, quiet, easy maintenance, and fine appearance. This far-reaching advance is the result of years of development by Motor Wheel, world's largest wheel makers.

For the first time, highest grade material is used in a steel wheel. Strength is multiplied. Every form of stress is accurately distributed.

The mounting is as much better as the wheel itself. Larger studs are possible; they take no radial stress at all, and at least 50% less torque. Hence Spoksteel equipment assures the highest possible resistance to shock, looseness, and permanent deflection.

The inherent advantages of Spoksteel design and construction are fully realized in service, because these wheels must mount perfectly—there is no other way. All studs and nuts are right-hand; in dual mounting the inner wheels stay in place independently; and the final locking is positive.

Reducing depreciation, maintenance and labor costs, Spoksteel wheels also produce many indirect economies. Tires are protected by the excellent radiation properties of Spoksteel wheels. Proper inflation is encouraged because valves are accessible. Brake wear is less and adjustments are fewer because Spoksteel wheels can be kept clean on the inner side.

Wheel noises cannot develop in Spoksteel wheels, and chassis sounds are not magnified. Spoksteel silence and good looks are factors in attracting and holding bus business. Spoksteel design and construction assure lowest wheel and tire costs in handling the business.

It is another of the notable developments which are responsible for the clear leadership of Motor Wheel. A test set of Spoksteel wheels—readily applied to standard hubs—will reveal new possibilities for improving production and operation of buses and trucks of every type.

MOTOR WHEEL CORPORATION, LANSING, MICHIGAN

Motor Wheel

Strongest

Easiest Mounting, Inflation, Cleaning and Care

High Carbon Forged Steel

The practical application of this far better wheel material was made possible only by Motor Wheel experience and facilities. Spoksteel wheels are far stronger without excess weight—important in reducing tonnage—and vital in relieving tires.

Cool Running

The spoked design, character of material, rim application, and mounting of Spoksteel wheels all tend to improve radiation. Impartial competitive tests have recorded the ability of Spoksteel wheels to keep tires many degrees cooler—much further below critical temperatures.

Perfect Mounting

Piloted to hubs, Spoksteel wheels assure best load distribution over greatest possible area. The studs used greatly exceed standard strength, carry no radial load, and only a fraction of the torque. Broken studs, chewed-up holes and cracked wheels become a thing of the past.

Positive Locking

The Spoksteel locking flange is a development of the pioneer Motor Wheel design which has been one of the chief factors in the general success of steel wheels. Complication and delicate parts are eliminated. Incorrect application is quite impossible. Wheel changes are facilitated because spoke-type wheels are always more easily handled. And in dual service the inner Spoksteel wheel stays in place positively while the second wheel is applied. Both wheels lock with one operation.

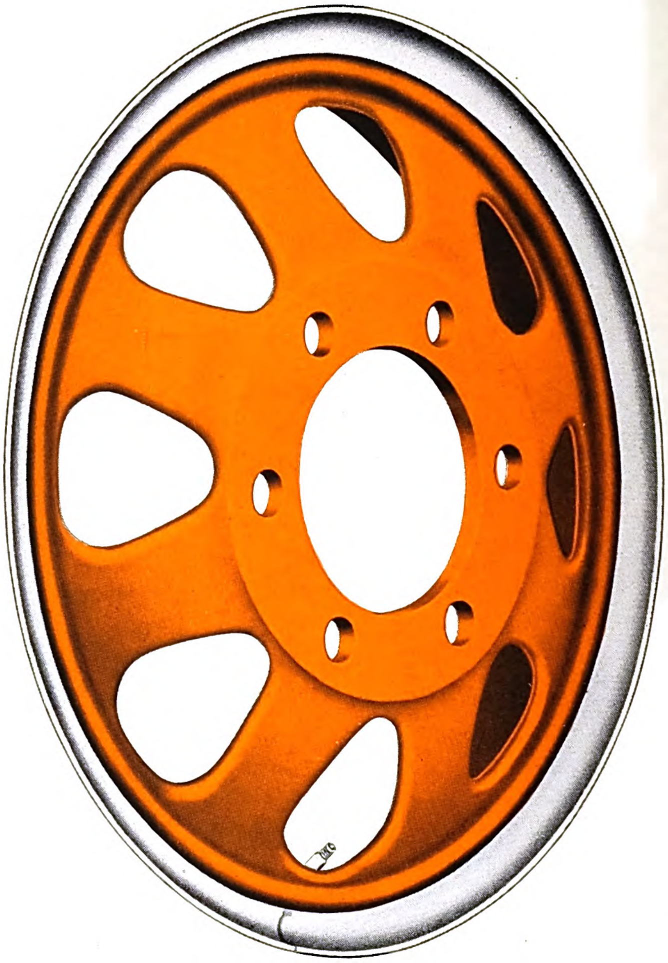
Silence, Cleanliness, Convenience

Spoksteel wheels are permanently silent and they do not "cage" or magnify other chassis sounds. Dirt is not stored up and dumped into the brakes. Tire inflation is easy and quick. In emergencies, wheel repairs can be properly made without special costly machinery or factory facilities.

Single and Dual

The full advantages of pneumatic tires are now available for every operator of buses or trucks. An experimental set of Spoksteel wheels—single and dual—will set up new figures for low-cost and high-mileage.

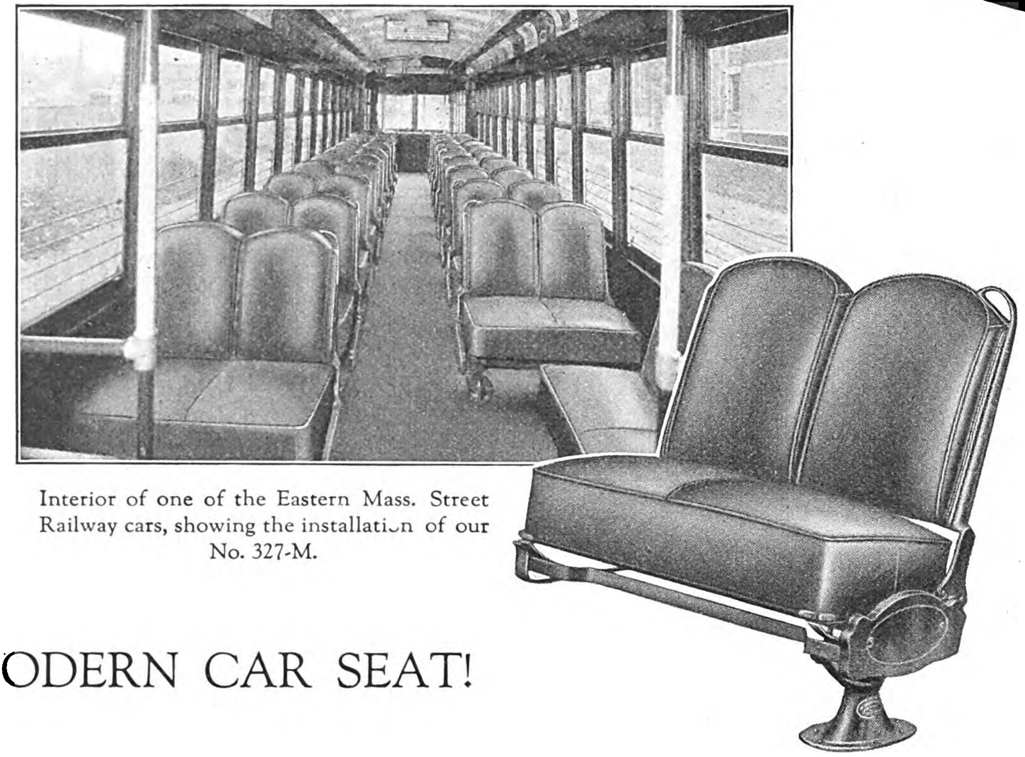
MOTOR WHEEL CORPORATION
LANSING, MICHIGAN



Motor Wheel
PRODUCTS

101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may be ordered through any H-W sales office.



Interior of one of the Eastern Mass. Street Railway cars, showing the installation of our No. 327-M.

A MODERN CAR SEAT!

THE Eastern Massachusetts Street Railway was in the market for a modern car seat that would increase the attractiveness and comfort of its cars. It finally selected our 327-M—the new, fast-selling Heywood-Wakefield design shown above.

This seat has deep, double spring cushions. Mechanism rails are set in. The individual backs are properly pitched for comfort.

Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W sales office.

Heywood-Wakefield
Bus Seats

We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.

Heywood-Wakefield

REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.

Helping MANUFACTURERS *to serve* YOU *more efficiently*

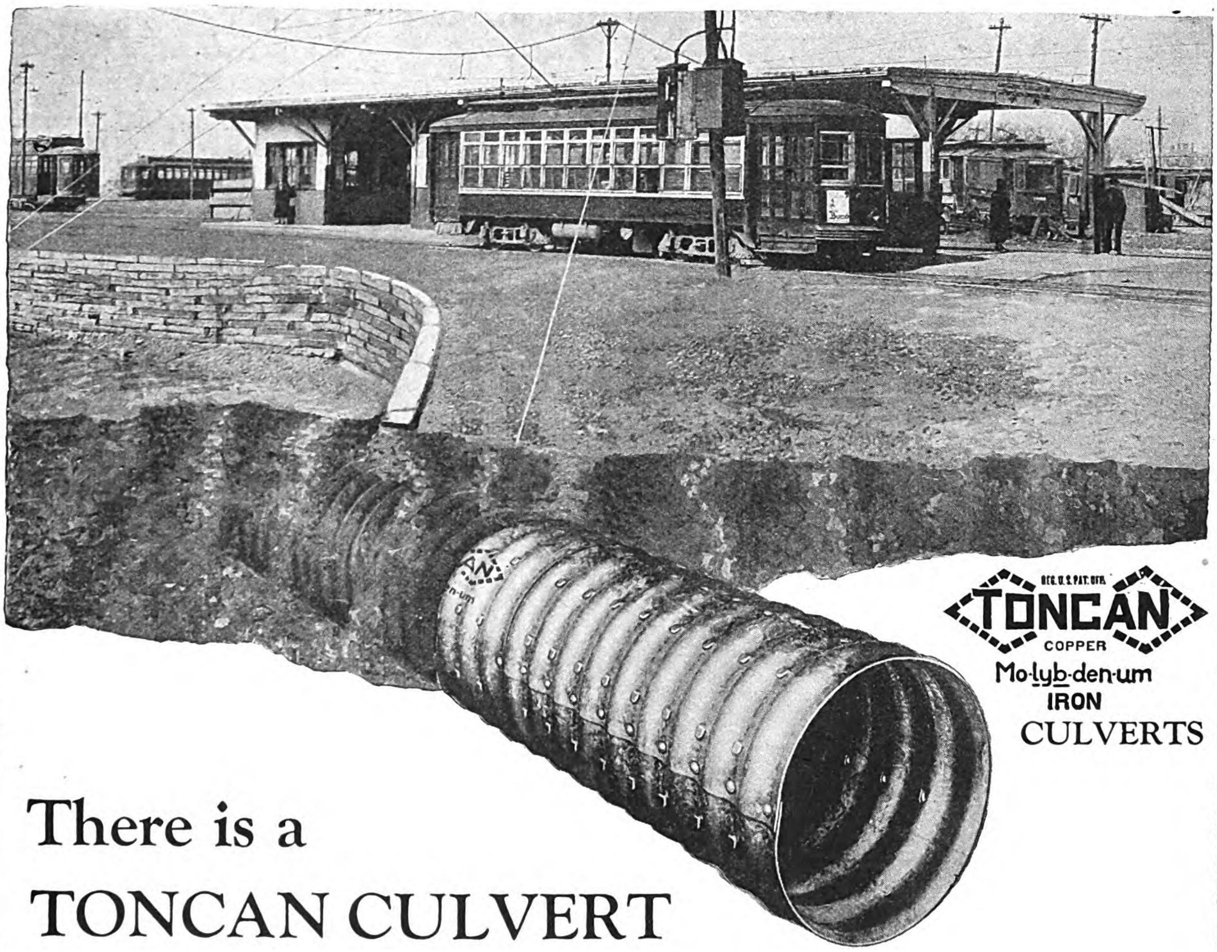
❧

THROUGH McGraw-Hill questionnaires we have been able to give manufacturers facts which have helped them standardize on sizes most acceptable in a particular industry.

We have also through McGraw-Hill questionnaires been able to convince manufacturers that they have been delinquent in rendering service.

So when you receive a McGraw-Hill questionnaire you can fill it out, confident that it will return to you in the form of better service to your business.

The Publishers



REG. U.S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON
CULVERTS

There is a TONCAN CULVERT Buried in the Neponset Carhouse Yard

THE installation of a Toncan Culvert in the Neponset yards of the Boston Elevated Railway embodies every reason for their use wherever a culvert is required.

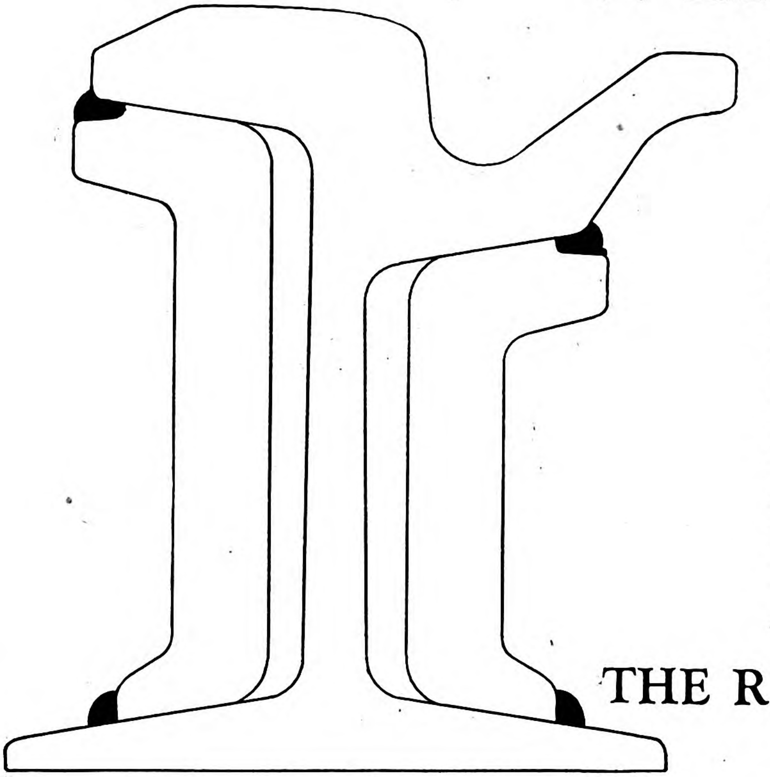
Obviously it was imperative to select a culvert material that possessed the vitality to warrant placing it beyond the reach of visual inspection. Toncan Iron was chosen.

Toncan Iron has the natural corrosion resistance of iron increased by the addition of copper and molybdenum. The resultant alloy provides a resistance to corrosion heretofore unattainable.

You may not have to bury your culverts beyond easy access but it is profitable and sound business to buy culverts that can be so placed. Specify Toncan Iron.

CENTRAL ALLOY STEEL CORP., *Massillon,* OHIO
World's Largest and Most Highly Specialized Alloy Steel Producers
Makers of Agathon Alloy Steels
Cleveland Detroit Chicago New York St. Louis
Syracuse Philadelphia Los Angeles Tulsa
Cincinnati San Francisco Seattle

TONCAN COPPER MO-LYB-DEN-UM **IRON**



“WELD PLATES”

For EFFICIENT, ECONOMICAL

JOINTS

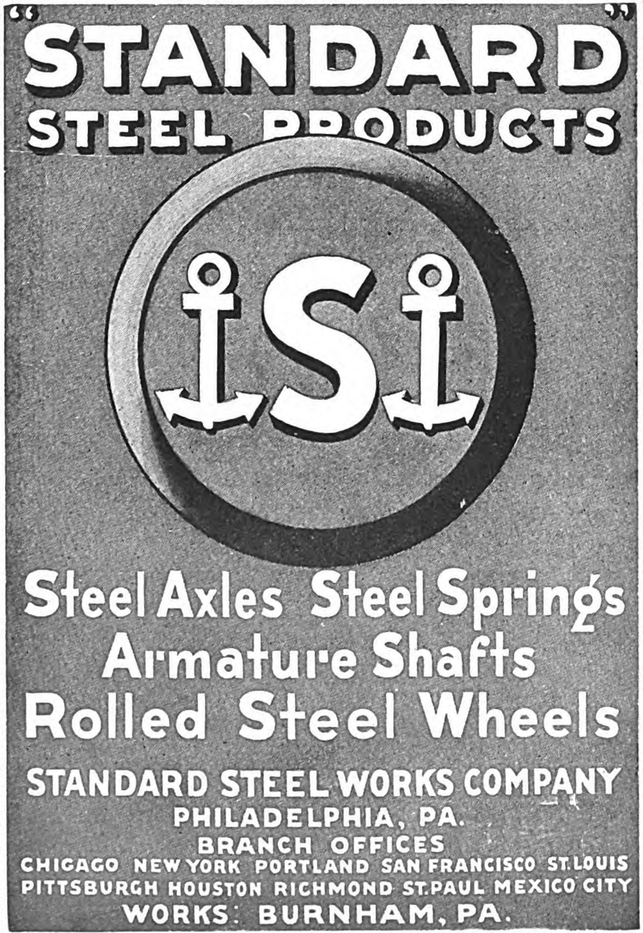
Do you believe in statistics? Rely on performance records? If so the performance records of the many “Weld Plates” now in use will convince you that they lead the bar-weld joints in efficiency and economy.

“Weld Plates” represent the most modern welding practice. They are the strongest and most up-to-date plates rolled especially for electric welded joints. Note the shape—the grooves for retaining plenty of weld metal along the upper edges—the wide contact areas at top and bottom—the suitability for the use of short bolts.

A trial will convince you of their efficiency and economy.

THE RAIL JOINT COMPANY

165 Broadway, New York



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Steel Axles Steel Springs
Armature Shafts
Rolled Steel Wheels

STANDARD STEEL WORKS COMPANY
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Where performance counts

use

Le Carbone Carbon Brushes

They talk for themselves

W. J. Jeandron

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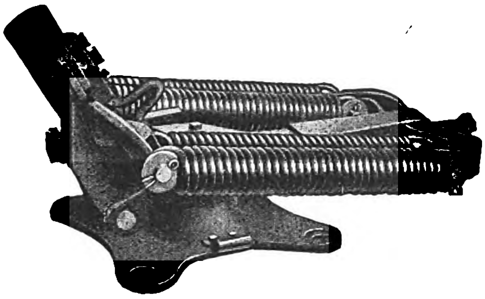

US 20A base with Timken Bearings

Ever Grease a Trolley Base?

If you have ever greased one of the older types, you will appreciate the lubrication features of the US 20A trolley base. The base contains reservoirs which require filling but once every six months; and then all that is necessary is to remove a pipe plug and replenish the lubricant. The lubrication of the working parts of the US 20A is positive and reliable at all times.

The lubricant is securely held in an upright metal cup from which it is impossible for it to leak out and deface the car roof. This is accomplished without the use of leather gaskets or other makeshift arrangements.

Send for
bulletin No. 46.

R.D.NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. district offices are sales representatives for Nuttall Railway Products.

Canadian Agent:
Lyman Tube & Supply Co., Montreal

Nuttall

Shuler

Front Axles

For MOTOR BUSSES

Spirit of Co-operation

Satisfactory service must include more than a mere source of supply.

A lively interest in your needs, together with an organization able to meet your requirements, is your assurance of *constructive co-operation.*

FRONT AXLES ONLY

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Incorporated

Louisville, Ky.

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CHICAGO NEW YORK SAN FRANCISCO

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
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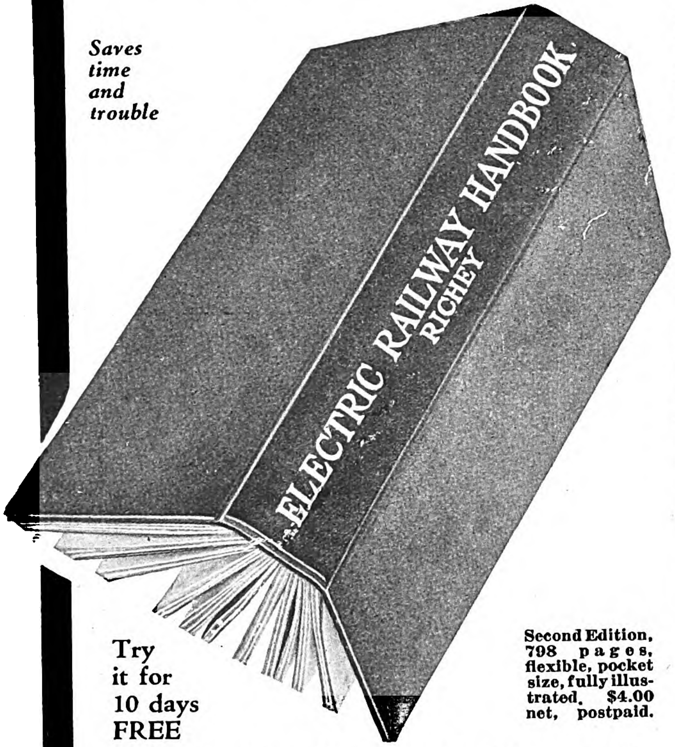

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Specifications and plans may be seen at the office of the Department on the 12th floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of fifty (50) dollars will be required for the specifications and plans. This deposit will be refunded upon return of the specifications and plans in good condition.

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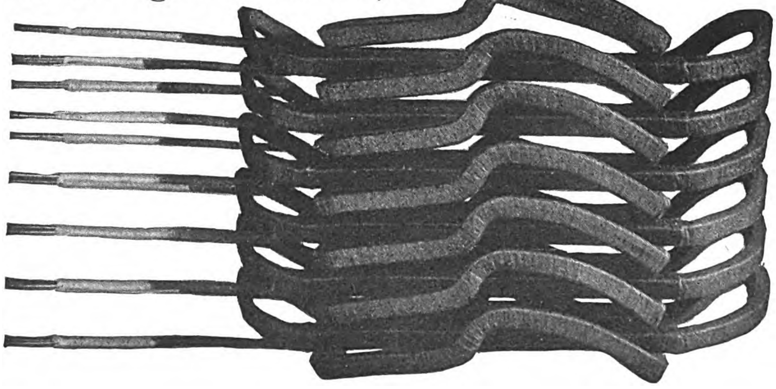

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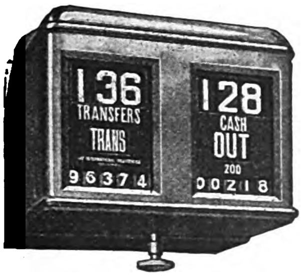

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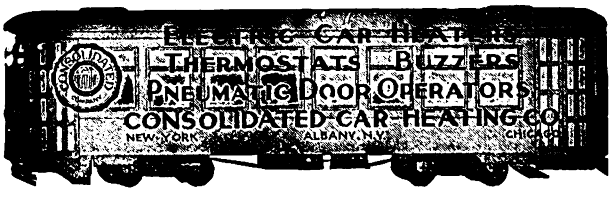

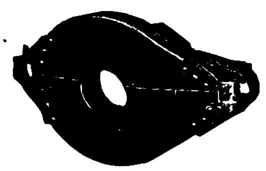

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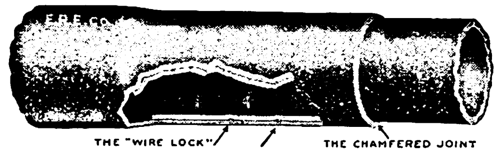

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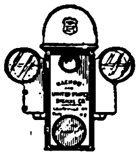

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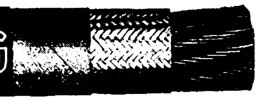

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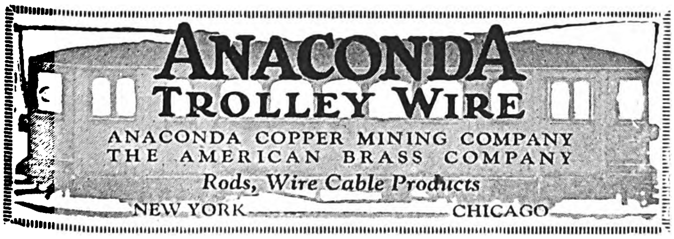

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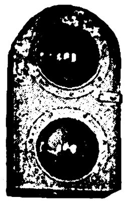

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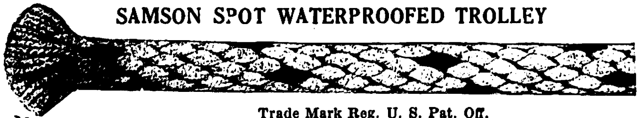

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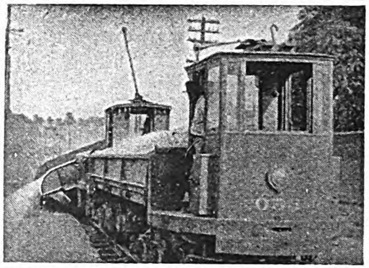

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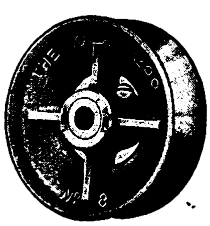

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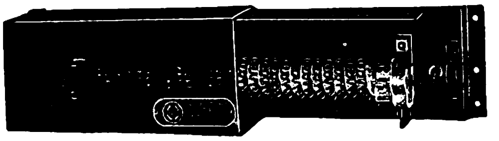

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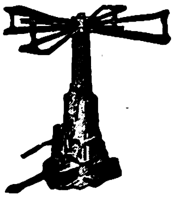

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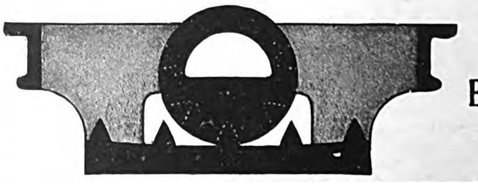

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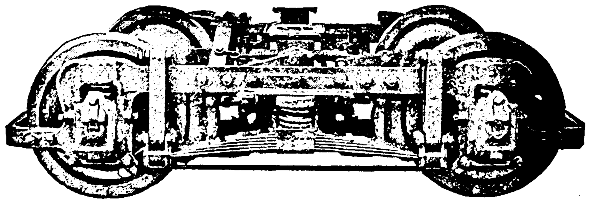

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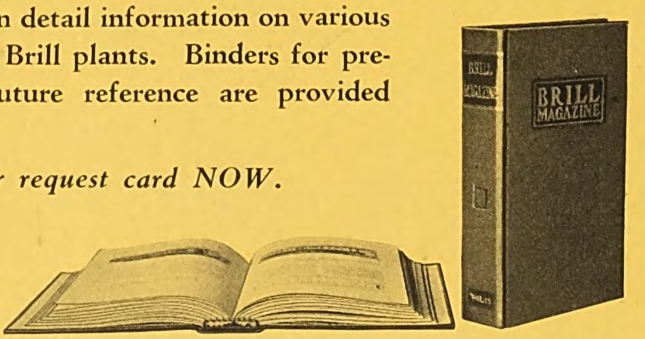

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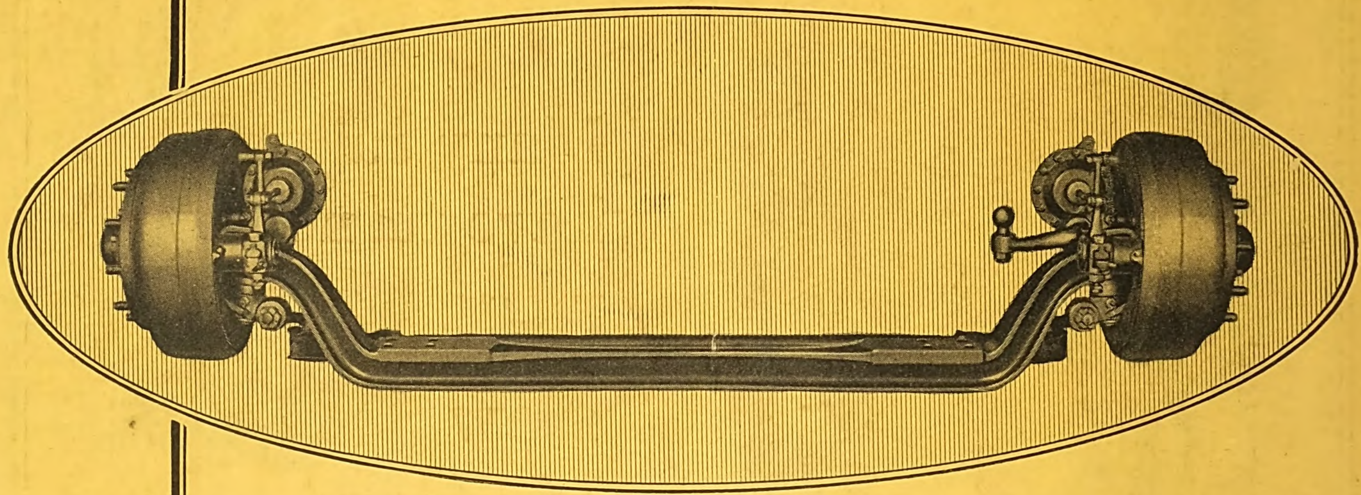

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